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(RESEARCH ARTICLE)

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Impact of patient education on quality of life of hemodialysis patients: A prospective study

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Abstract

BACKGROUND: A six – month study was conducted in a Teritiary Care Hospital, Kerala, India examined the quality of life of hemodialysis in 54 patients with chronic kidney disease (CKD). Dialysis is a form of renal replacement therapy which the kidney's role of filtration of blood is supplemented by an artificial equipment to remove excess water, solutes and toxins. Data were collected from patient records and interviews with patients or their caregivers.

METHODS: The study used the KDQOLSF -36 questionnaire to assess the quality of life in hemodialysis patients, covering aspects like physical functioning, pain and mental health.

RESULTS: The prevalence of hemodialysis was found in older age groups, with the highest percentage observed in the age >60 (53.70). The study found that most hemodialysis patients were male (72.2) and underwent hemodialysis twice a week (79.62%). Common habits among CKD patients included alcoholism (31.48%) and smoking (11.11%). Hypertension (88.89%) and Diabetes mellites (55.56%) were prevalent comorbidities, with some patients also experiencing anemia (11.11%).

CONCLUSION: The results of this follow up showed a significant improvement in the scores across various domains compared to the baseline scores. This suggests that patient education can play a crucial role in enhancing the quality of life for patients undergoing hemodialysis.

Keywords: Kidney; Patients; Quality of Life; KDQOLSF 36; CKD

1. Introduction

Chronic kidney disease as it was historically termed that encompasses all degrees of decreased kidney function from a damaged at risk through mild, moderate and severe chronic kidney failure. Chronic kidney disease is a worldwide public health problem.

Chronic kidney disease is more prevalent in the elderly population. Almost half of the patients with chronic kidney disease are older than 60 years. However, while younger patients with chronic kidney disease typically experience progressive loss of kidney function. Chronic kidney disease is associated with an increased risk of cardiovascular disease and end stage kidney disease.[1]

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The guidelines define CKD as either kidney damage or a decreased glomerular filtration rate of less than 60Ml/MIN/1.73m2 for at least 3 months. Whatever the underlying etiology once the loss of nephrons and reduction of functional renal mass reaches a certain point, the remaining nephrons begin a process of irreversible sclerosis that leads to a progressive decline in the GFR.[2]

Hemodialysis is a life sustaining treatment for individuals whose kidneys can no longer effectively filter waste products and excess fluids from their blood. This condition often a consequence of CKD, poses a significant threat to health and wellbeing. Hemodialysis steps in as a vital intervention, replicating the kidney's function through a complex yet efficient process.

The Process: The procedure typically occurs in a specialized medical facility known as a dialysis Centre. Patients referred to as dialysis patients, undergo hemodialysis sessions regularly often several times a week depending on their condition's undergo hemodialysis sessions regularly often several times a week, depending on their condition's severity. The process involves the use of a hemodialysis machine, which acts as an artificial kidney. During a session, blood is drawn from the patient through a catheter or vascular access point, commonly an arteriovenous fistula or graft. This blood then filtered through the dialyzer a component of the machine containing semi- permeable membranes. Subsequently the purified blood is returned to the patient's body.[3]

Impact on Patients: For individuals reliant on hemodialysis, the procedure is more than just a medical necessity- it's a lifeline. Hemodialysis grants them the opportunity to lead relatively normal lives despite their kidney condition. However, the regimen demands significant adjustment, both physically and emotionally. Patients must adhere to strict dietary restrictions, fluid intake limitations, and medication schedules to optimize the effectiveness of treatment and manage associated symptoms.

The need for regular sessions, coupled with the uncertainity surrounding their health, can lead to feelings of anxiety, depression and frustration. Moreover, the time commitment required for treatment may disrupt their daily routines, impacting work, family life and social interactions.

1.1. Quality of life in Hemodialysis patient

End level renal affection is the ultimate level that has alarming effect on a patient's high satisfactory of actually especially because of the imposed obstacles in all domain names in their each day existence. Hemodialysis is a complicated approach for endure that demands common dialysis Centre visits, so this can result in significant adjustments within side the everyday manner in their living. Hemodialysis could be very time consuming, costly and fluid restrictions. Long time period use of dialysis outcomes in lack of freedom and disrupts family, social existence and monetary income. For those reasons, their fitness associated high satisfactory of existence are negatively affected. The principal goal of the look at become to estimate the quantity of arterial occlusive lesion in hemodialysis sufferers primarily based totally on age, sex, income and medicinal drug adherence.[4]

1.2. Kidney disease quality of life sf36 (kdqolsf-36):

Reliable valid and interpretable patient reported outcomes for patients are needed for patient monitoring and use as outcomes in clinical trials. The kidney disease quality if life 36- item short form survey (KDQOL-36) is often used with patients on dialysis, but improvements are needed to facilitate interpretability of its scores.[5]

2. Material and methods

Sampling size determination:

Hemodialysis patient in nephrology department.

Sample size for a given mean is:

$$N = \frac{\left(z_1 - \frac{\alpha}{2}\right)^2 \sigma^2}{E^2}$$

σ is the standard deviation and
E is the margin of error

Data from a previous study found a standard deviation of 18.0

Here = 18.0

z= 1.96 (95% confidence level)

E= 5

$$N = \frac{z^2\sigma^2}{E^2}$$

$$= \frac{1.96^2 \times 18.0^2}{5^2} = 49.8$$

Anticipating loss to follow up and missing of data, the minimum sample size was rounded to be 60.

A prospective study was conducted over a period of six months in dialysis OPD in a tertiary care hospital in Kerala, India after IRB approval. A total of 60 patients were in the hemodialysis department during the study period. Out of these, 54 patients who met the inclusion criteria were analyzed. The inclusion criteria were the patients of dialysis OPD of 18 years or older and both the genders who were diagnosed with chronic kidney disease in nephrology department. The Patient who are not willing to participate in the study, pregnant women and children, the inpatients who were undergoing hemodialysis, critically ill patients were excluded from the study. Patient came to the OPD of a tertiary care hospital, SH medical Centre Kottayam over 6-month period (prospective) was identified from dialysis department. All the relevant and necessary data of patients coming to the dialysis department was collected from the patient case record. Adverse effects of hemodialysis patients were determined by direct observation, patient interview and case records. Data was entered using Microsoft Excel and statistical analysis were done using paired t test.

3. Result and discussion

A total of 54 patients met with the inclusion criteria were included in the study.

Table 1 Age wise distribution N=54

Age in years	Frequency	Percentage
18-40	2	3.70
41-60	23	42.59
>60	29	53.70

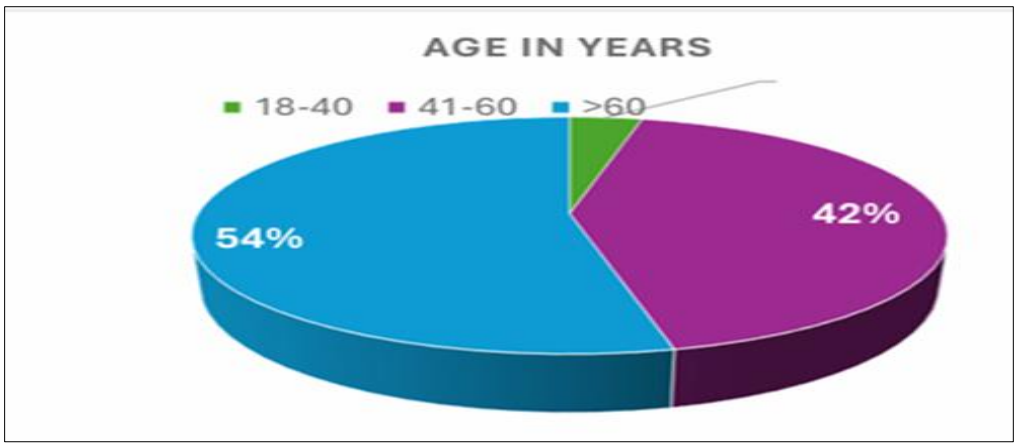

Figure 1 Age wise distribution of study population

Inference: This chart shows the distribution of hemodialysis patients across these age brackets. It highlights the prevalence of hemodialysis in older age groups, with the highest percentage observed in the age >60 (53.70%). This is due to the age-related decline in kidney function, prevalence of chronic diseases and longevity.

Table 2 Gender wise distribution N=54

Sex	Frequency	Percentage
Male	39	72.2
Female	15	27.8

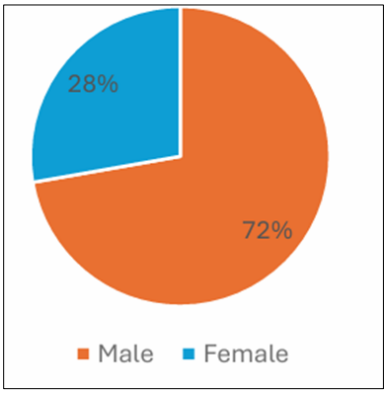

Figure 2 Gender wise distribution of the study population

Inference: The data highlights the prevalence of hemodialysis in older age groups, with a higher percentage observed in males (72.2%). Men may be at increased risk of reaching kidney failure sooner than women because of differences in hormone level. Higher testosterone levels in men may cause a loss in kidney function. On the other hand, men's kidneys may not be protected by estrogen, which is higher in women until menopause. Men may have unhealthier lifestyle thereby leading to a higher risk for kidney failure.

Table 3 Duration of hemodialysis N=54

Duration	Number of patients (n)	Percentage (%)
1 year	14	25.92
2 years	15	27.78
3 years	19	35.18
4 years	6	11.12

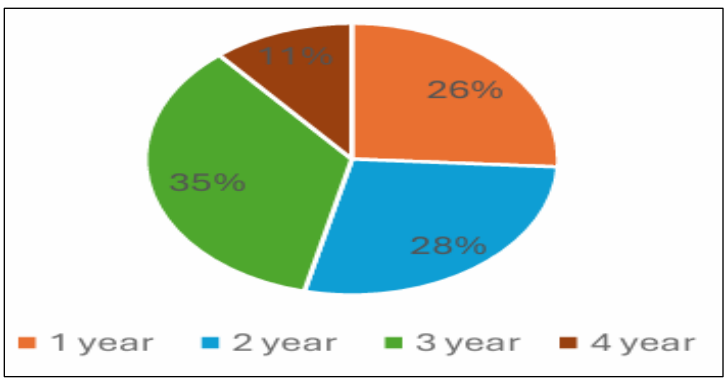

Figure 3 Duration of hemodialysis in the study population

Inference: This data shows an increasing trend in the number of patients over the first three years, with a significant drop in the fourth year (11.12%) due to Patient Outcomes: Some patients may have received a kidney transplant, recovered kidney function, or unfortunately, may have passed away. Treatment Changes: Patients might have switched to a different treatment modality, such as peritoneal dialysis or conservative management.

Table 4 Social habits of patients before dialysis N=54

Habits	Number of patients (n)	Percentage
Alcoholism	17	31.48
Smoking	06	11.11
Patients with no social habits	31	57.40

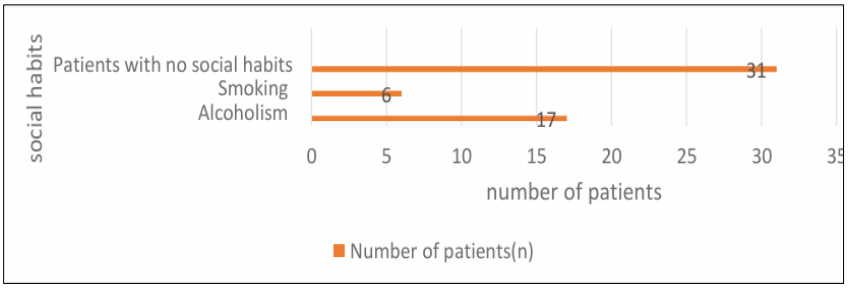

Figure 4 Social habits of patients before dialysis in the study population

Inference: In this study, 31.48% of the patients had a history of alcoholism, which can lead to liver disease and high blood pressure, both risk factors for chronic kidney disease (CKD). Additionally, 11.11% of the patients were smokers, a habit known to damage blood vessels, reduce blood flow to the kidneys, and increase the risk of kidney disease. However, the majority of patients (57.40%) did not have these social habits, suggesting that other factors such as genetics, medical conditions, or environmental exposures may play a significant role in the development of CKD. Furthermore, social determinants of health, including economic stability, education, and access to healthcare, were also found to influence the risk of developing CKD. Poor socioeconomic conditions can lead to inadequate nutrition, exposure to environmental toxins, and limited access to healthcare, all of which can contribute to the onset and progression of CKD. Therefore, addressing these modifiable lifestyle and social factors is crucial in preventing CKD and improving patient outcomes.

Table 5 Quality of life of hemodialysis patient before and after pharmacist intervention (using KDQOL Scale) N=54

Domains	Baseline score mean difference	Follow up score mean difference
Health related	28.59	24.13
Kidney related	38.41	32.63
Kidney on the daily basis	22.37	13.22

Inference: The mean baseline scores before intervention were higher across all domains, including health related, kidney related and kidney impact on daily basis. After the pharmacist intervention the mean follow up scores decreased, suggesting an improvement in patient's conditions. This demonstrates the effectiveness of pharmacist -led educational and management programs in enhancing the overall health and quality of life for hemodialysis patients.

Table 6 Comparison of Health-Related quality of life of hemodialysis patients before and after pharmacist intervention N=54

Time	Mean	Standard deviation	Mean difference	t value (Paired t test)	p value
Baseline	28.59	4.12	4.46	6.229	<0.001
Follow up	24.13	3.62			

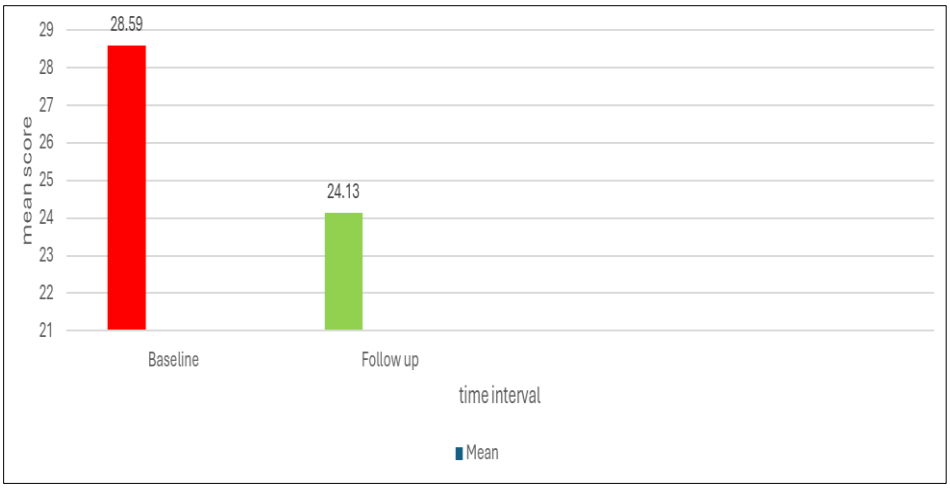

Figure 5 KDQOLSF- 36 health related quality of life of hemodialysis patient baseline and follow-up score in the study population

Inference: A p-value of <0.001*** suggests that the difference in means is statistically significant, with a very low probability that this difference could have occurred by chance. This means we can be very confident that the observed decrease in the KDQoL scores from baseline to follow-up is not due to random variation, and likely reflects a real change in the health-related quality of life of the patients. The decrease in mean scores suggests that patients' perceived quality of life improved over the period between the baseline and follow-up measurements. The health related quality of life of patients was improved after pharmacist intervention.

Table 7 Comparison of Kidney related quality of life of hemodialysis patients before and after pharmacist intervention N=54

Time	Mean	Standard deviation	Mean difference	t value (Paired t test)	p value
Baseline	38.41	8.85	5.78	7.299	<0.001
Follow up	32.63	6.65			

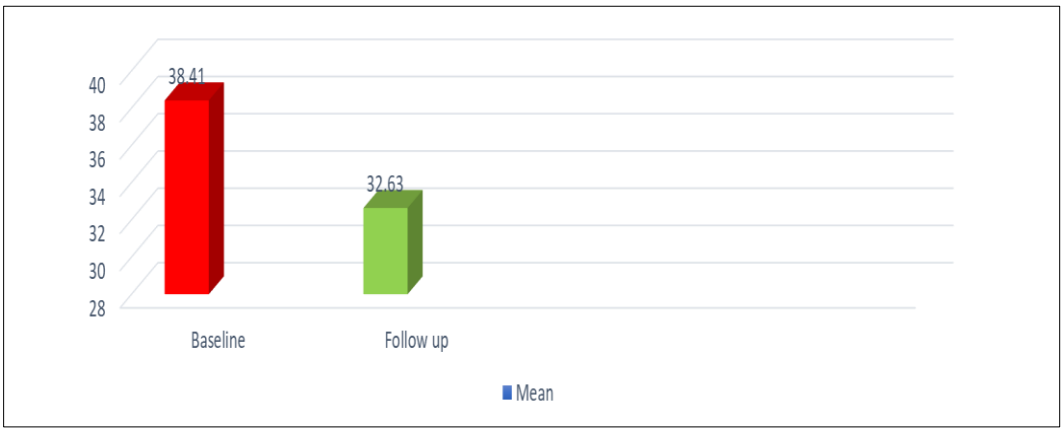

Figure 6 KDQOLSF- 36 Kidney related quality of life of hemodialysis patient baseline and follow-up score in the study population

Inference: In this study, the initial mean value of the measured parameter was 38.41 reflecting the variability among patients at the start. Over time, the mean value decreased to 32.63, indicating a decrease in the measured parameter and less variability among patients. The mean difference of 5.78 suggests a significant change over time.

Table 8 Comparison of kidney on daily basis quality of life of hemodialysis patients before and after pharmacist intervention N=54

Time	Mean	Standard deviation	Mean difference	t value (paired t test)	p value
Baseline	22.37	5.97	9.15	9.556	<0.001
Follow up	13.22	3.23			

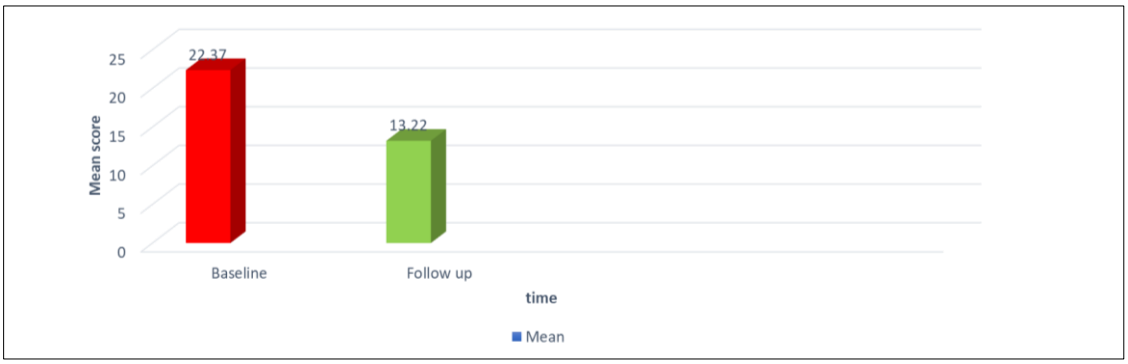

Figure 7 KDQOLSF- 36 Kidney on daily basis quality of life of hemodialysis patient baseline and follow-up score in the study population

Inference: A p-value of <0.001* indicates that the change is statistically significant, meaning it's highly unlikely that this difference is due to chance.The significant p-value suggests that whatever intervention or event occurred between the baseline and follow-up had a real and measurable impact on the patients. The decrease in mean scores suggests that patients' perceived quality of life had been improved over the period between the baseline and follow-up measurements.

4. Conclusion

This study offers valuable insights into the multifaceted challenges faced by hemodialysis patients and the impact of patient education on their health related quality of life. The study population was predominantly male, with the majority of patients being over 60 years old. Most patients underwent hemodialysis twice a week and the duration of hemodialysis increased over the first three years, with a significant drop in the fourth year. The study highlighted the prevalence of comorbidities such as hypertension, diabetes and anemia among these patients. It also sheds light on the common social habits of alcoholism and smoking among this population. The quality of life of hemodialysis patients as assessed by the KDQOLSF -36 improved after patient education. This emphasizes the importance of patient education in managing this chronic condition.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest in conducting this study, the design, data collection, analysis, interpretation, reporting its findings or publication of this research.

Statement of ethical approval

The study was approved by the Institutional Ethics Committee

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Centers for Disease Control and Prevention. Deaths and Mortality. Available at https://www.cdc.gov/nchs/fastats/deaths.htm. May 2, 2024; Accessed: September 16, 2024.

[2] Schnaper HW. Remnant nephron physiology and the progression of chronic kidney disease. Pediatr Nephrol. 2014 Feb. 29 (2):193-202. [QxMD MEDLINE Link].

[3] Hall YN, Larive B, Painter P, et al. Effects of six versus three times per week hemodialysis on physical performance, health, and functioning: Frequent Hemodialysis Network (FHN) randomized trials. Clinical Journal of the American Society of Nephrology. 2012;7(5):782–794.

[4] CentraL.New information about health-related quality of life. NACCHO News;1998

[5] kidney disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int Suppl. 2013. 3:1-150.

[6] Lameire N, Van Biesen W. The initiation of renal-replacement therapy-just-in-time delivery. N Engl J Med. 2010 Aug 12. 363(7):678-80.

[7] Wang, L.-J., & Chen, C.-K. (2012). The Psychological Impact of Hemodialysis on Patients with Chronic Renal Failure. In Renal Failure - The Facts (pp. 6,337). MomirPolenakovic (Ed.). IntechOpen. DOI: 10.5772/36832.

[8] Hays, R.D., et al. (1997). Kidney Disease Quality of Life Short Form (KDQOL-SF™), Version 1.3: A Manual for Use and Scoring. Santa Monica, CA: RAND, P-7994

[9] Thenmozhi P. Quality of life of patients undergoing hemodialysis. Asian J Pharm Clin Res. 2018 Apr 1;11(4):219-23.

[10] Nagasawa H, Tachi T, Sugita I, Esaki H, Yoshida A, Kanematsu Y, Noguchi Y, Kobayashi Y, Ichikawa E, Tsuchiya T, Teramachi H. The effect of quality of life on medication compliance among dialysis patients. Frontiers in pharmacology. 2018 Jun 5;9:488.

[11] Naderifar M, Tafreshi MZ, Ilkhani M, Akbarizadeh MR, Ghaljaei F. Correlation between quality of life and adherence to treatment in hemodialysis patients. Journal of Renal Injury Prevention. 2018 Feb 27;8(1):22-7.

[12] Alikari V, Tsironi M, Matziou V, Tzavella F, Stathoulis J, Babatsikou F, Fradelos E, Zyga S. The impact of education on knowledge, adherence and quality of life among patients on haemodialysis. Quality of Life Research. 2019 Jan 15;28:73-83.

[13] Guerra-Guerrerro V, Plazas MD, Cameron BL, Salas AV, González CG. Understanding the life experience of people on hemodialysis: adherence to treatment and quality of life. Nephrology Nursing Journal. 2014 May 1;41(3):289.

[14] Morsch CM, Gonçalves LF, Barros E. Health-related quality of life among haemodialysis patients–relationship with clinical indicators, morbidity and mortality. Journal of clinical nursing. 2006 Apr;15(4):498-504.

[15] Cleary J, Drennan J. Quality of life of patients on haemodialysis for end-stage renal disease. Journal of advanced nursing. 2005 Sep;51(6):577-86.

[16] Kimmel PL, Peterson RA, Weihs KL, Simmens SJ, Boyle DH, Cruz I, Umana WO, Alleyne S, Veis JH. Aspects of quality of life in hemodialysis patients. Journal of the American society of Nephrology. 1995 Nov 1;6(5):1418-26.

[17] National Kidney Foundation. KDOQI clinical practice guideline for hemodialysis adequacy: 2015 update. Am J Kidney Dis. 2015;66(5):884-9301.

[18] Pozzoni P, Del Vecchio L, Pontoriero G, Di Filippo S, Locatelli F. Long-term outcome in hemodialysis: Morbidity and mortality. J Nephrol 2004;17 Suppl 8: S87-95.

[19] Inker LA, Astor BC, Fox CH, Isakova T, Lash JP, Peralta CA, et al.KDOQI US commentary on the 2012 KDIGO clinical practice guideline for the evaluation and management of CKD. Am J Kidney Dis 2014; 63:713-35.

[20] Jha V, Garcia-Garcia G, Iseki K, Li Z, Naicker S, Plattner B, et al.Chronic kidney disease: Global dimension and perspectives. Lancet 2013; 382:260-72.

[21] Correa-Rotter R, Wesseling C, Johnson RJ. CKD of unknown origin in Central America: The case for a Mesoamerican nephropathy. Am J Kidney Dis 2014; 63:506-20.