

Assessment of Disease State Awareness among Chronic Kidney Disease Patients Undergoing Hemodialysis in Divisional Headquarter Hospital Mirpur, Pakistan

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Abstract

Background: Chronic Kidney Disease is a non-communicable disease which can often progress to kidney failure and can be a potential cause of some cardiovascular complications. There is need to assess awareness of disease to prevent progression. **Objectives:** The objective of the present study was to assess the disease state awareness among patients undergoing hemodialysis. **Materials and Methods:** A cross-sectional, non-experimental and questionnaire based study was conducted during December 2020 to February 2021 in DHQ hospital Mirpur among patients undergoing hemodialysis. The questionnaire was translated into “Urdu” language, as it is native language of Pakistan. Descriptive and inferential statistics were used to analyse the results. SPSS version 20 was used for statistical analysis. **Results:** Amongst the 111 patients admitted in the hemodialysis center, 109 patients filled the questionnaire. Out of 109 patients, 58 (53.2%) were males. Urban residents were 56 (51.54%), 99 (90.8%) were Kashmiri, 30 (27.5%) had religious education, and 90 (82.6%) were non-occupational. Most of the patients were suffering from several co-morbidities such as, hypertension; 91 (83.5%), diabetes; 37 (33.9%), hyperlipidemia; 7 (6.4%), CVD; 19 (7.4%), hepatitis C; 23 (23.1%) and others; 15 (13.8%). Overall mean awareness score was 2.2±1.6. Among demographic variables, education and gender had significant *p*-values (*p* < 0.05). **Conclusion:** The awareness among patients was satisfactory but not adequate. Therefore, counseling programs about the disease and its management should be conducted in order to educate all the caretakers/patients with chronic kidney disease and end stage renal disease (ESRD).

Key words: Renal insufficiency, Chronic, Renal dialysis, Awareness, CKD.

INTRODUCTION

In the last century, infectious diseases were the major cause of death. But, in the 21st century, non-communicable and chronic diseases have become the major cause of death and disability. Chronic Kidney Disease (CKD) has become a major public health problem worldwide, with a prevalence rate of over 10% in the general population, therefore causing millions of casualties due to the high economic value of the treatment.^[1-3] The incidence of CKD increases at an annual rate of 8% and it consumes about 2% of the total health expenditure globally. The incidence of CKD is 6 – 8 times higher in 70 – 90 years old people as compared to those between 30 – 50 years of age.^[4]

Chronic kidney disease (CKD) is defined as “reduced estimated glomerular filtration rate (eGFR) below 60ml/min/1.73m² persisting for 3 months or longer”^[5] or “the presence of albuminuria is associated with progression to end-stage renal disease (ESRD)”^[6]. CKD patient has impaired excretory renal function suggestive of loss of functional nephrons,^[7] which can lead to cardiovascular diseases.^[8] Major traditional risk factors of CKD are diabetes, hypertension, and obesity. Among non-traditional, risk factors include nephrotoxins, prescription medicines and alternative remedies, kidney stones, fetal and maternal exposures (low birth weight), infections, environmental exposures, and acute kidney infections (AKI).^[9] If left untreated at the early stages, CKD can progress rapidly into major complications increasing the mortality rate significantly.^[10] These complications include; anemia, mineral and bone disorder, metabolic acidosis, dyslipidemia, cardiovascular diseases (CVDs), and severe malnutrition.^[10]

The kidney disease burden is rising globally due to several factors such as, lack of awareness and poor access to laboratory services.^[11] Lack of awareness is due to the absence, inaccessibility, or inaccuracy of information. Due to lack of awareness, people visit healthcare facilities once the disease has worsened or reached a late stage, resulting in a lower chance of effective treatment.^[12] Awareness of disease and symptoms is essential for early detection. Adequate awareness among patients can slow down disease progression and can be helpful to prevent future fatalities. Literature suggests that there are different studies conducted on physicians and other populations.^[13-15] Lack of reliable and validated tool is observed in reported studies. To date, there is no study reported on CKD awareness among patients undergoing hemodialysis in Pakistan. The present study aims to evaluate CKD-related awareness among patients undergoing hemodialysis through reliable tool.

MATERIALS AND METHODS

A cross-sectional, non-experimental, observational and questionnaire based quantitative study was conducted during December 2020 to February 2021 in the Hemodialysis Centre (HDC), in Divisional Headquarter Hospital (DHQ) Mirpur, Pakistan. A total of 111 copies of questionnaires were distributed to patients undergoing hemodialysis. Patients aged 15 years and above who had been diagnosed with ESRD (end-stage renal disease) and undergoing hemodialysis, irrespective of the cause and co-morbidity were included in the study. The study was performed on all hemodialysis patients registered in DHQ Mirpur. Five point Likert scale, pre-validated questionnaire was used. The questionnaire had three sections; demographic information, clinical data

of hemodialysis patients and 18 questions about CKD awareness.

First section

“Demographic data” includes; patient gender, age, education, nationality, smoking occupation, and monthly income.

Second section

“Clinical data” includes hemodialysis duration, hemodialysis frequency, hemodialysis access site, co-morbidity (if any), clinical lab values (hemoglobin, serum creatinine, blood urea nitrogen BUN), and current medication.

Third section

This section was the awareness questionnaire. It has four sub-sections regarding awareness:

Questions 1-7 are about awareness of the disease, i.e., either the patient has an understanding of the disease or is just taking treatment. Questions 8-12 are about the awareness of CKD-related diet and exercise, i.e., the effect of low physical activity and an unhealthy diet on the progression of the disease and quality of life. Questions 13-16 are about patient comprehension of laboratory examinations and connotations, i.e., the patient awareness about tests and sample collection. Questions 17-18 covers awareness of medical resources, i.e., patient contact with medical staff in case of any problem, to avoid deterioration of the disease.

Questionnaire was first translated into Urdu language by Back-Forward method. Reliability and validity was checked before administering the questionnaire. Participants were asked to choose the most suitable answer according to their awareness of each question.

Translation method

Back-Forward method

The questionnaire was translated into simple “Urdu” as a language medium so that patients can easily understand it. Translator 1 (medical professional) and translator 2 (non-medical professional translator) translated it into Urdu for the first time. Then Urdu translated questionnaire was translated back to English by translator 3 (medical professional) and translator 4 (non-medical). Their translated questionnaire was compared with an original pre-developed questionnaire and few modifications in translation were further made by committee member. The finalized Urdu version was accepted when every participant of the meeting agreed to no further change.

Data analysis

Data were analyzed by using IBM SPSS (Statistical Package for Social Sciences) version 20. Descriptive statistics was used to determine the clinical, demographic, and disease awareness characteristics of the study population. The variables with categories were measured as frequency and percentages and continuous variables were expressed as mean \pm standard deviation. Inferential statistics were used to assess the significance of demographic and disease awareness. Kruskal-Wallis and Mann-Whitney U test are non-parametric tests used for inferential statistical analysis.

Ethical considerations

A permission letter Ref. No: 106/11/EX/ACP/20, approved by Review Board and Ethical Committee of “Akson College of Pharmacy” was submitted to the DHQ hospital Mirpur, Pakistan. The permission letter from hospital was submitted to the HDC. Written informed consent were taken from patients before their enrolment in the study.

RESULTS

Questionnaire reliability and validity analysis

Cronbach’s alpha test showed acceptable reliability of 0.82. The translated questionnaire was distributed to 20 patients randomly and all were able to understand it. This showed good face validity.

Demographic characteristics

Out of 109 patients, there were 58 (53.2%) males and 51 (46.8%) females. The age ranged from 15-62 (years) and above, 56 (51.54%) were urban residents and 53 (48.65%) were rural. Majority of patients (82.6%) were married, The education levels were Religious 30 (27.5%), Primary 18 (16.5%), Middle 14 (12.8%), Matric 24 (22.0%), Intermediate 9 (8.3%), Graduation 6 (5.5%) and None 8 (7.3%) respectively. Out of all partakers 53 (48.6%) have no monthly income and 56 (51.4%) have monthly income. 26 (23.9%). The demographic and social characteristics are summarized Table 1.

Clinical data

Out of 109 patients undergoing hemodialysis, 34 (31.2%) have a duration of <1 year, 62 (56.9%) have 1-5years, 11 (10.1) have 6-10 years and 2 (1.8) have duration >10 years. The patients having hemodialysis frequency once a week are 2 (1.8%), having twice a week are 104 (95.4%) and having thrice in a week are 3 (2.8%) respectively. Out of all patients who have hemodialysis access site AV fistula are 74 (67.9%) and have hemodialysis catheter are 35 (32.1%). Patients with Co-morbidities have hypertension 91 (83.5%), Diabetes 37 (33.9%), Hyperlipidemia 7 (6.4%), CVD 19 (7.4%), Hepatitis C positive 23 (23.1%) and others 15 (13.8%) respectively. Out of 109 patients, the mean Hemoglobin (g/dL) was 9.4 (SD=1.7), Serum Creatinine mg/dL) was 10.9 (SD= 7.8) and Urea (mg/dL) was 156.6 (SD= 66.4) respectively. Clinical data is given in Table 2.

Awareness questions response

Responses of question 1, 4, 8, 9 and 18 showed good awareness with mean values 3.0 (SD \pm 1.6), 3.3 (SD \pm 1.3), 3.0 (SD \pm 1.5), 3.5 (SD \pm 1.1), 3.0 (SD \pm 1.7), respectively. The response of question 7 and 17 showed poor awareness with mean values 1.0 (SD \pm 1.7), and 0.7 (SD \pm 1.4). Awareness response are given in detail in Table 3.

Awareness source

There were 9 sources of awareness which included TV, newspaper, doctor, hospital staff, pharmacist, internet, book, friends and family and information charts. The sources of knowledge are summarized in Table 4.

Comparison of mean awareness score of dependent and independent variables (demographic)

Among demographic variables, education and gender had significant *p*-values (*p* < 0.05). The rest of demographic variables had no association with dependent variables (*P* > 0.05) as described in Table 5.

Table 1: Demographic data of hemodialysis patients (N=109).

S.N.	Demographic characteristics	Frequency	Percentage
	Age (years)		
	15-30	12	11
1.	31-46	33	30.3
	47-62	38	34.9
	Above 62	26	23.9
2.	Gender		
	Male	58	53.2
	Female	51	46.8
3.	Residence		
	Urban	56	51.54
	Rural	53	48.6
4.	Marital status		
	Married	90	82.6
	Un-married	19	17.4
5.	Ethnicity		
	Kashmiri	99	90.8
	Punjabi	10	9.2
6.	Smoking		
	Smokers	9	8.3
	Non-smokers	100	91.7
7.	Education		
	Religious	30	27.5
	Primary	18	16.5
	Middle	14	12.8
	Matric	24	22.0
	Intermediate	9	8.3
	Graduation	6	5.5
	None	8	7.3
8.	Occupation		
	Student	1	0.9
	No occupation	90	82.6
	Retired	4	3.7
	Government employ	3	2.8
	Private job	1	0.9
	Labor	5	4.6
	Other	5	4.6
9.	Monthly income (Rupees)		
	Less than 10,000	26	23.9
	10,001 - 19,999	12	11
	20,000 - 29,999	8	7.3
	30,000 - 39,999	2	1.8
	40,000 - 49,999	2	1.8
	50,000 and above	6	5.5
	None	53	48.6

DISCUSSION

The study aimed to assess the disease state awareness in hemodialysis patients (ESRD) in DHQ hospital, Mirpur, Pakistan. This was the first study conducted on CKD awareness in AJ&K. Results showed satisfactory awareness of about 56% (42.3 is the average awareness score out of 72). Past studies on CKD patients showed low awareness 23 to 40% in non-hemodialysis patients in Africans-American patients,^[16,17] 45.6 % awareness in Kenya,^[18] 29 % awareness in Africa,^[16] satisfactory awareness in China,^[19] poor awareness in Australia,^[20] poor awareness in Nigeria.^[21]

Cronbach’s alpha showed that the questionnaire has acceptable reliability, $\alpha = 0.82$ near to original study of validation by Peng S *et al.* in 2019 in China ($\alpha = 0.852$) (19). P Gheewala *et al.* study in Australia showed $\alpha = 0.88$ (20), Li Lou *et al.* e-version study in China showed $\alpha = 0.962$ (22).

In demographic data, gender and education has a significant (p -value < 0.05),

Table 2: Clinical data of hemodialysis patients (N=109).

S.N.	Clinical Data	Frequency	Percentage %
1.	Hemodialysis Duration (years)		
	Less than 1	34	31.2
	1-5	62	56.9
	6-10	11	10.1
	Greater than 10	2	1.8
2.	Hemodialysis Frequency (per week)		
	1	2	1.8
	2	104	95.4
	3	3	2.8
3.	Hemodialysis Access site		
	AV fistula	74	67.9
	Graft	0	00
	Hemodialysis catheter	35	32.1
4.	Co-morbidity		
	Hypertension	91	83.5
	Diabetes	37	33.9
	Hyperlipidemia	7	6.4
	Cardiovascular disease	19	7.4
	Hepatitis C positive	23	23.1
	Others	15	13.8
Clinical Lab Values			
S.N.	Parameter	Mean	S.D (±)
1.	Hemoglobin (g/dL)		
	Normal value		
	Female :12-15.5	9.4	1.7
	Male: 13.5-17.5		
2.	Serum Creatinine (mg/dL)		
	Normal value	10.9	7.8
	0.8-1.2		
3.	Urea (mg/dL)		
	Normal value	156.7	66.5
	15-50		

Table 3: Awareness Response (N=109).

Awareness Response			
S.N	Question	Mean	S.D (±)
1.	Do you know what symptoms will develop when you get worse?	3.0	1.6
2.	Do you know what aggravates your kidney function?	2.3	1.8
3.	Do you know the long-term prognosis of your disease?	2.8	1.6
4.	Do you know how to control your blood pressure?	3.3	1.3
5.	Do you know the name and usage of your medication?	2.7	1.6
6.	Do you know the primary role of your medication?	2.5	1.7
7.	Do you know which medicine may impair kidney function?	1.0	1.7
8.	Do you know what are unhealthy diets?	3.0	1.5
9.	Do you know food which should be avoided?	3.5	1.1
10.	Do you know what contains high-quality proteins?	1.8	1.8
11.	Do you know how much salt to be used daily?	2.1	1.8
12.	Do you know what exercise fits you?	1.8	1.9
13.	Do you know what laboratory examinations you should regularly check?	2.4	1.9
14.	Do you know how to collect your urine correctly?	2.1	1.9
15.	Do you know the meanings of your test reports?	2.0	1.8
16.	Do you know how to evaluate your curative effect?	2.8	1.7
17.	Do you know what kind of educational activities are organized regularly in our hospital?	0.7	1.4
18.	Do you know how to contact our medical staff when you have a question/problem?	3.0	1.7
Mean score		2.2	1.6

Table 4: Source of awareness (N=109).

Source of awareness			
S.N.	Source	Frequency	Percentage %
1.	Television	4	3.7
2.	Newspaper	2	1.8
3.	Doctor	103	94.5
4.	Hospital staff	24	22
5.	Pharmacist	1	0.9
6.	Internet	6	5.5
7.	Book	1	0.9
8.	Friends and family	4	3.7
9.	Information charts	6	5.5

Table 5: Association between dependent and independent variables.

S.N.	Demographic characteristics	Mean	S.D (+)	p-value
1.	Age (years)			0.603
	15-30	2.4	0.9	
	31-46	2.4	0.9	
	47-62	2.3	0.9	
	Above 62	2.6	0.6	
2.	Gender *			0.017
	Male Female	2.6 2.2	0.7 0.8	
3.	Residence			0.136
	Urban Rural	2.5 2.3	0.8 0.8	
4.	Marital status			0.344
	Married Un-married	2.4 2.6	0.8 0.8	
5.	Ethnicity			0.188
	Kashmiri Punjabi	2.4 2.7	0.8 0.8	
6.	Smoking			0.155
	Smokers Non-smokers	2.7 2.4	1.0 0.8	
7.	Education **			0.021
	Religious	2.1	0.9	
	Primary	2.4	0.8	
	Middle	2.1	1.0	
	Matric	2.6	0.7	
	Intermediate	2.6	0.4	
8.	Occupation			0.435
	Student	3.1	0.0	
	No occupation	2.3	0.8	
	Retired	2.2	1.5	
	Government employ	2.4	0.1	
	Private job	2.8	0.0	
9.	Monthly income (Rupees)			0.479
	Less than 10,000	2.1	0.8	
	10,001 - 19,999	2.4	1.0	
	20,000 - 29,999	2.3	1.2	
	30,000 - 39,999	2.4	0.7	
	40,000 - 49,999	2.0	0.6	
50,000 and above	3.0	0.6		
	None			

* Mann-Whitney U test

** Kruskal-Wallis test

thus affecting awareness. Males (2.6 ± 0.7) showed greater awareness than females (2.2 ± 0.8). These results are comparable to the study carried out by S Hodlmoser *et al.* in 2020, where CKD prevalence in females is greater but awareness is less.^[23] Education (p -value 0.021) in males is also higher. All the graduate patients were male (3.1 ± 0.7). The low literacy rate of females in Pakistan may be one of the reasons of less awareness. A study by LC Plantinga *et al.* in 2008 in the USA showed male sex, proteinuria, diabetes, and hypertension were all significantly associated with greater odds of CKD awareness.^[24]

Patients undergoing 2 hemodialysis per week were 95.4%. Patients with AV fistula access site and hemodialysis catheter access were 67.9% and 32.1%, respectively. A study by D Santoro *et al.* in 2014 reported that the arteriovenous fistula (AVF) remains the first choice for access. The patient preference for a catheter varies across countries, i.e., 1% of hemodialysis patients in Japan, 18% in the United States, 42% in Belgium, and 44% in Canada.^[25]

Hypertension prevalence in this study was 83.5% which is comparable to the study performed by Paul Muntner *et al.* in 2010 in America with a prevalence of 85.7%.^[26] Diabetes mellitus prevalence was 33.9%. A study performed in 2014 by Jacobein C *et al.* in America showed hypertension 25% and diabetes 7.4%^[27] which indicates that hypertension has a greater risk to CKD progression.

Among all the sources of CKD awareness, the doctors (94.5%) were the major source of awareness, the hospital staff was 24% and only 5.5% of patients selected information charts. Pharmacist was 0.9%, the reason was that patients were unable to distinguish between a clinical pharmacist and a physician. Physician and pharmacist both were considered doctors by patients.

The awareness questionnaire analysis showed patients were well aware of disease symptoms, mean and SD (3 ± 1.6) and the majority of patients know how to control their blood pressure (3.3 ± 1.3). The lowest awareness score questions were of medicine impairing kidney function (1 ± 1.7) and activities organized for spreading awareness (0.7 ± 1.4).

The study excludes children (15 years and below) and, is limited to one dialysis center only. Only ESRD hemodialysis patients were included. The sample size was less (109 patients) due to a lack of research timing. Only one center was selected due to pandemic COVID-19.

CONCLUSION AND RECOMMENDATION

In conclusion, the awareness among patients was satisfactory therefore all the caretakers/patients of chronic kidney disease and ESRD must be provided good educational awareness and counseling programs about the disease and its management to improve the quality of life. This will help to improve medication, protein diet intake, and suitable exercise awareness.

Awareness should be given at the early stages of CKD to delay the progression and enhance the patient’s quality of life. As females were less educated they should be counseled properly. Pamphlets and detailed information charts about CKD should be available at nephrology OPD and dialysis centers. Every patient with kidney disease should be given a pamphlet to provide awareness on the first diagnosis.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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