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## Original Article

### TO INVESTIGATE THE QUALITY OF LIFE, DISCOURAGEMENT AND BURDEN OF INDICATIONS IN BOTH CHRONIC KIDNEY DISEASE AND END STAGE KIDNEY DISEASE

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## ABSTRACT

**Background and objectives:** While many patients with end-stage renal disease (ESRD) have impaired physical and psychological well-being, less is known about these health domains in patients with advanced chronic kidney disease (CKD). We sought to compare symptoms, depression, and quality of life in patients with ESRD and those with CKD. **Design, setting, participants, & measurements:** Patients with ESRD and subjects with advanced CKD were enrolled. Patients' symptoms, depression, and quality of life were assessed using the Dialysis Symptom Index (DSI), Patient Health Questionnaire-9 (PHQ-9), and Short Form 36 (SF-36), respectively, and these health domains were compared between patient groups. 43 with ESRD and 42 with CKD were enrolled. There were no differences in the overall number of symptoms or in the total DSI symptom-severity score. Median scores on the PHQ-9 were similar, as was the proportion of patients with PHQ-9 scores >9. SF-36 Physical Component Summary scores were comparable, as were SF-36 Mental Component Summary scores. The burden of symptoms, prevalence of depression, and low quality of life are comparable in patients with ESRD and advanced CKD. Given the widely recognized impairments in these domains in ESRD, findings of this study underscore the substantial decrements in the physical and psychological well-being of patients with CKD.

**Key Words:** Decitabine, RP-HPLC, % RSD, LOD & LOQ.



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## 1. INTRODUCTION

The kidneys clean unwanted waste and additional water from blood as urine. Chronic kidney illness causes kidneys

to miss this purpose over time. End-stage kidney illness is the last stage of chronic kidney illness. It means the kidneys no longer function well to meet the wants of daily life.

End-stage kidney illness is also identified as end-stage renal illness. The kidneys of persons with ESRD function below 10 % of their normal capability, which may mean they are barely working or not working at all. The therapy for ESRD is dialysis or kidney relocation. In some circumstances, way of life alters and drug therapy may help.

**REASONS OF CHRONIC KIDNEY ILLNESS/ ETIOLOGY:**

Kidneys carry out the compound system of filtration in our bodies - additional waste and liquid material are detached from the blood and emitted from the body.

In most cases, kidneys can eradicate most left-over materials that our body produces. However, if the blood run to the kidneys is affected, they are not functioning correctly because of harm or illness, or if urine discharge is clogged, difficulties can happen. Kidneys bring out the difficult system of separation in our bodies - additional waste and fluid material are detached from the blood and expelled from the body.

In the most of cases, advanced kidney harm is the outcome of a chronic illness (a long-term illness), such as:

- **Diabetes** - chronic kidney illness is related to diabetes types 1 and 2. If the patient's diabetes is not fine controlled, extra sugar (glucose) can gather in the blood. Kidney illness is not common through the first 10 yrs of diabetes; it more normally happens 15-25 yrs later analysis of diabetes.
- **Hypertension (high blood pressure)** - high blood pressure can harm the glomeruli - parts of the kidney difficult in purifying waste products.
- **Obstructed urine flow** - if urine movement is stopped it can back up into the kidney from the bladder. Obstructed urine flow raises pressure on the kidneys and damages their function. Possible causes include an enlarged prostate, kidney stones, or a tumor.
- **Kidney disorders** - involving polycystic kidney illness, pyelonephritis, or glomerulonephritis.
- **Kidney artery stenosis** - the renal artery contracts or is obstructed before it goes into the kidney.
- **Some toxins** - together with fuels, solvents like carbon tetrachloride and lead. Even some types of jewels have poisons, which can lead to chronic kidney failure.
- **Fetal developmental issue** - if the kidneys do not progress correctly in the fetus while it is growing in the womb.
- **Systemic lupus erythematosus** - an autoimmune illness. The body's own immune system strikes the

kidneys as though they were imported tissue.

- **Malaria and yellow fever** - known reason for reduced kidney function.
- **Some medications** - overdoing of, for example, NSAIDs (non-steroidal anti-inflammatory medicins), such as aspirin or ibuprofen.
- **Illegal material misuse** - such as heroin or cocaine.
- **Injury** - a sharp blow or physical damage to the kidney(s).

The study is to investigate the quality of life, discouragement and burden of indications in both chronic kidney disease and End Stage Kidney Disease.

## 2. EXPERIMENTAL SECTION

### Study Setting and Design:

As part of a larger, prospective cohort trail of sleep, memory, and QOL in sufferers with advanced Chronic Kidney Disease and subjects undergoing chronic peritoneal dialysis or thrice-weekly in-center hemodialysis, we managed a sub analysis of sufferers' indications, depression, and QOL. This trail was accepted by the Review Board, and all participants were provided informed consent forms.

Between December 2016 and July 2017, sufferers with ESRD on maintenance dialysis and sufferers with a H/o stage 4 or 5 CKD accepting care at local dialysis units or OP nephrology clinics. Excluding criteria involved age <18 yr or >90 yr, not residing at home, active infection (pneumonia), active malignancy, active CAD within the last six months, advanced cirrhosis, progressive dementia, active alcohol misuse, active therapy for sleep apnea, refractory psychiatric disorders, or an dangerous home environment. Sufferers without excludings were reached at the time of their repetitive CKD clinic visit, dialysis initial visit to the renal replacement clinic and signed form for informed consent. This trail was performed in accordance with the values of the Declaration of Helsinki.

**Data Capture:** We evaluated sufferers' demographic features and abstracted serologic variables

from the medical documents involving the most recent hemoglobin and serum calcium, phosphorous, albumin, and creatinine. For sufferers with a H/o stage 4 or 5 CKD, we used the most recent serum creatinine and 4-variable Modification of Diet in Renal Disorder trail compared to measure their estimated GFR.

Some sufferers initially identified in the screening phase as having a H/o stage 4 CKD demonstrated an estimated GFR that was consistent with advanced stage 3 CKD. These sufferers were involved in our trail. We also evaluated sufferers' functional status using the Karnofsky Presentation Status Scale and Lawton Instrumental duties of Daily Living Scale. Less results on the Karnofsky scale and greater results on the Lawton scale shows greater functionality. As the parent trail including the evaluation of sleep standard in sufferers' homes, all enrolled sufferers self-administered the examination surveys at the time of this home visit.

We used the **PHQ-9 to assess the existence and severity of depression**. This 9-item tool evaluate the incidence with which sufferers practice depressive thoughts or feelings over the prior 2 week. The severity of depressive diseases is considered moderate for scores level from 10 to 14, reasonably serious for scores of 15 to 19, and serious for scores of 20 to 27. The PHQ-9 has been used to evaluate depression in sufferers with ESRD and those with CKD. In sufferers on hemodialysis, scores >9 are 92% sensitive and specific for a diagnosis of depressive diseases <sup>(25)</sup>.

We used the **Medical Results trail Short Form-36 (SF-36) to assess QOL**. The SF-36 covers eight subscales (physical function, role limitations-physical, bodily pain, vitality, general health perceptions, role limitations-emotional, social function, and mental health) and 2 component summary scores, the Physical Component Summary (PCS) and Mental Component Summary (MCS). Higher scores designate better QOL. The SF-36 has been used widely in sufferers with kidney illness and has sound psychometric features in this population. <sup>(28-30)</sup>

### Statistical Analyses:

For our examines, we measured hemodialysis

and peritoneal dialysis sufferers collectively as one group (herein referred to as the ESRD group). These sufferers were related with those with progressive CKD. Alterations between the groups in demographic features, clinical variables, the prevalence and severity of individual indications, overall indication load and overall symptom severity, depression, and QOL were assessed using t test or Mann-Whitney tests for continuous variables, and the  $\chi^2$  statistic or Fisher's exact test for categorical variables.

To measure the influence of demographic and clinical variables on group alterations in indications, depression, and QOL, we used linear regression, logistic regression, or the Wilcoxon-Mann-Whitney rank sum test, as appropriate. Variables involved in these examines were those that demonstrated statistically significant differences between the study groups in univariate analyses.

We report changes in the 8 subscales of the SF-36 as well as the PCS and MCS scores. We evaluated correlations in each sufferer group among overall indication burden, overall indication severity, depression, and physical and mental well-being as calculated by the PCS and MCS using Spearman's connection coefficient, and assessed the internal consistency of the DSI using Cronbach's coefficient alpha. We applied the Bonferroni correction for the examines of differences in the occurrence and severity of individual indications on the DSI given the multiple comparisons.

For these analyses, a two-sided p-value of <0.002 was measured to represent statistical significance. For all other analyses, a two-sided p-value <0.05 was applied. All results were achieved using STATA version 8 (College Station, TX). We used graph pad prism software to calculate the results.

## 3. RESULTS AND DISCUSSIONS

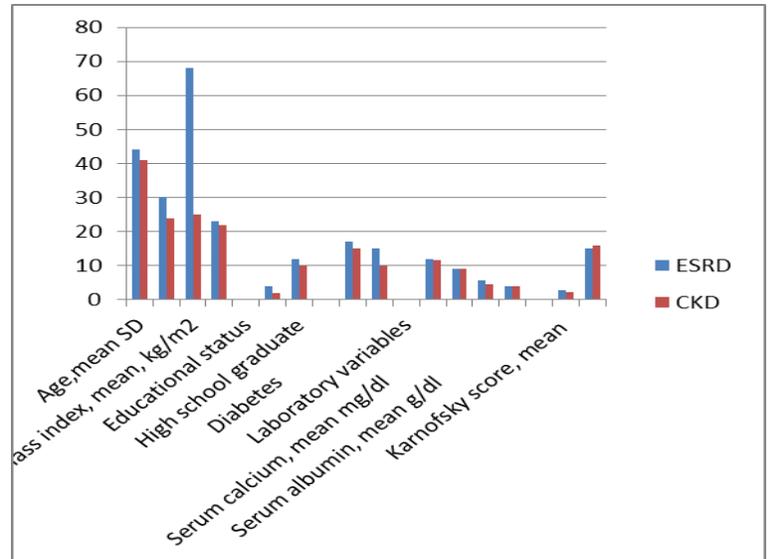
### Patient Characteristics:

Complete of 100 sufferers were screened for trail participation, and 93 met eligibility criteria. Of these, 8 did not whole the trail surveys, resulting in a sufferer population of 85. 43 sufferers (51%) had ESRD; 33 (78%) on hemodialysis and 10 (22%) on peritoneal dialysis. This cohort involved all ESRD sufferers from the larger cohort trail as of December 2016 to July 2017. 42 sufferers (49%)

had CKD. Sufferers with ESRD, have a greater serum phosphorous concentration, and have greater scores on the Karnofsky index and fewer score on the ADL, showing poor functional status.

**TABLE 1: Demographic data of the patients**

Demographic Variables	ESRD (n = 43)	CKD (n = 42)	P value
Age, mean (SD), y	44 ± 5.9	41 ± 6.5	0.2
Men % (n)	30 (51)	24 (57)	0.3
Body mass index, mean (SD), kg/m <sup>2</sup>	68 ± 4.2	25 ± 4.5	0.4
Married (%)	23 (53)	22(52)	0.7
Educational status			
Less than 9 <sup>th</sup> grade % (n)	4 (10)	2 (4)	0.1
High school graduate % (n)	12 (28)	10 (24)	0.6
Comorbid conditions			
Diabetes	17 (39)	15(36)	0.6
Cardiovascular disease	15 (36)	10 (24)	0.07
Laboratory variables			
Hemoglobin, mean (SD) g/dl	11.9 (1.6)	11.7 (1.5)	0.5
Serum calcium, mean (SD) mg/dl	9.0 (1.0)	9.1 (0.6)	0.5
Serum phosphorous, mean (SD) mg/dl	5.5 (1.6)	4.5 (1.2)	<0.001
Serum albumin, mean (SD) g/dl	3.9 (0.5)	3.8 (0.6)	0.1
Functional status			
Karnofsky score, mean (SD)	2.75 ± 1.3	2.1 ± 1.1	0.001
ADL. Median (IQR)	15 (13, 16)	16 (14.5, 16)	0.008



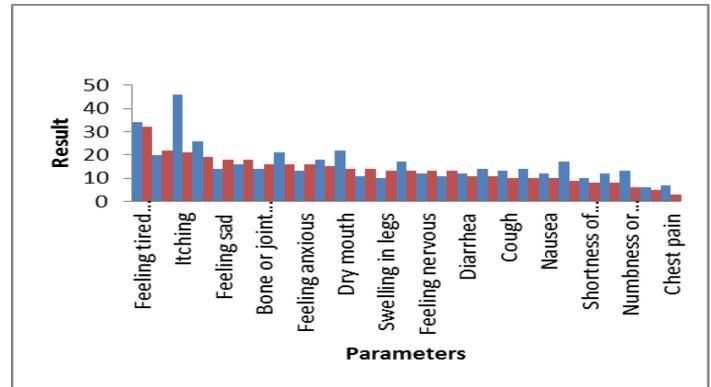
**Graph: 1 Demographic Data**

**Indications, Depression, and QOL:**

There was no difference in the mean overall no. of indications in sufferers with ESRD equated with those with CKD (11.2±6.4 vs 10.2±5.6). Sufferers with ESRD were more likely to report complication falling asleep (60% Vs 44%), dry mouth (50% Vs 34%), and lightheadedness/dizziness (39% vs 2%). However, none of these differences met the range of statistical notability after Bonferroni correction. The median overall indication-serious score was not different in sufferers with ESRD equated with CKD (20.5 Vs 15). The median seriousness of itching was higher in sufferers with ESRD equated with CKD (2.0 Vs 1.0). sufferers with ESRD also documented higher median severity scores for declined interest in sex (3.0 vs 2.0) and complication becoming sexually aroused (3.0 vs 2.0), although these differences did not reach the range of statistical notability after Bonferroni correction. There was a tendency toward more serious swelling in the legs among CKD sufferers equated with sufferers with ESRD (2.5 vs 1.0), although this changes was also not statistically notable.

**TABLE 2. Prevalence of symptoms**

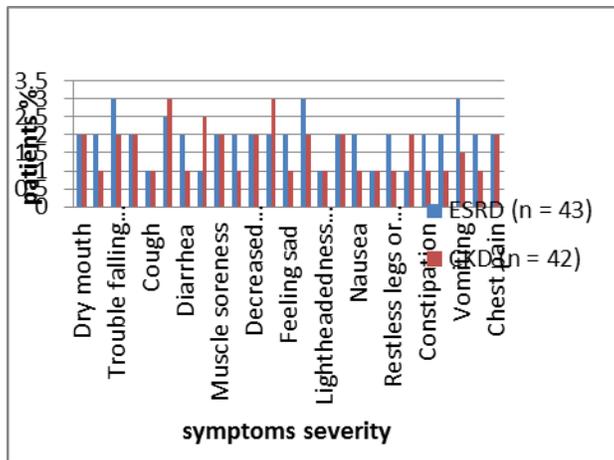
Symptom	ESRD (n = 43)	CKD (n = 42)	P value
Feeling tired or lack of energy	34 (79)	32 (78)	1
Dry skin	20 (47)	22(53)	0.5
Itching	46 (51)	21(51)	0.4
Trouble falling asleep	26 (60)	19 (44)	0.04
Feeling sad	14 (33)	18 (43)	0.2
Feeling irritable	16(37)	18(43)	0.5
Bone or joint pain	14 (33)	16(39)	0.4
Muscle cramps	21 (50)	16 (38)	0.1
Feeling anxious	13 (31)	16(38)	0.3
Decreased interest in sex	18 (43)	15 (36)	0.4
Dry mouth	22 (50)	14 (34)	0.05
Constipation	11 (26)	14 (33)	0.3
Swelling in legs	10 (24)	13(32)	0.3
Restless legs	17 (39)	13(32)	0.4
Feeling nervous	12 (29)	13(31)	0.9
Headache	11 (26)	13 (30)	0.6
Diarrhea	12 (28)	11(25)	0.7
Decreased appetite	14 (32)	11(25)	0.3
Cough	13 (31)	10 (24)	0.3
Muscle soreness	14 (33)	10 (24)	0.2
Nausea	12 (27)	10 (24)	0.7
Lightheadedness or dizziness	17(39)	9(23)	0.02
Shortness of breath	10 (23)	8 (22)	0.9
Difficulty concentrating	12 (28)	8 (22)	0.4
Numbness or tingling in feet	13 (30)	6 (21)	0.2
Vomiting	6(13)	5 (11)	0.8
Chest pain	3 (8)	3(8)	1



**Graph: 2 Prevalence of symptoms**

**TABLE. 3 Severity of symptoms of patients**

Symptoms	ESRD (n = 43)	CKD (n = 42)	P value
Dry mouth	2	2	0.2
Itching	2	1	0.001
Trouble falling asleep	3	2	0.4
Muscle cramps	2	2	0.1
Cough	1	1	0.6
Bone or joint pain	2.5	3	0.7
Diarrhea	2	1	0.04
Swelling in legs	1	2.5	0.08
Muscle soreness	2	2	0.1
Shortness of breath	2	1	0.3
Decreased appetite	2	2	0.7
Numbness or tingling in feet	2	3	0.3
Feeling sad	2	1	0.6
Decreased interest in sex	3	2	0.009
Lightheadedness or dizziness	1	1	0.5
Feeling anxious	2	2	0.5
Nausea	2	1	0.2
Headache	1	1	0.3
Restless legs or difficulty keeping legs still	2	1	0.1
Feeling irritable	1	2	0.01
Constipation	2	1	0.7
Difficulty concentrating	2	1	0.3
Vomiting	3	1.5	0.2
Feeling nervous	2	1	0.5
Chest pain	2	2	0.6



**Graph: 3 Symptom Severity**

The median PHQ-9 score in sufferers with End Stage Renal Disease was same to that of sufferers with CKD (5.0 vs 4.0). The part of sufferers with PHQ-9 scores >9 was same in sufferers with ESRD and CKD (15.5% vs 15%). There were no changes in the part of sufferers with moderate, moderately serious, and severe depressive disease.

11 sufferers, 4 in the End Stage Renal Disease group and 7 in the CKD group, did not whole the SF-12 and were not involved in the QOL examination. Sufferers with ESRD had lower bodily function results than those with CKD, with no changes noted in any of the other SF-12 subscale. However, overall physical safety as calculated by the PCS was similar (36.6±10.3 ESRD Vs 39.3±10.5), as was general mental well-being as calculated by MCS (44.6± 7.8 in ESRD vs 44±7.3). There were no associations of stage of Chronic Kidney Disease or kind of dialysis with indications, depression, or QOL results.

In regression examination, we observed the attenuating or intensifying effects of race, phosphorous concentration, CVD, Karnofsky score, and Activities of Daily Living Scale score on differences in indications, depression, and QOL between the trail groups. Phosphorous concentration attenuated the no statistically notable changes in the seriousness of “declined interest in sex,” while functional status as calculated by the Actions of Daily Living Scale attenuated the no statistically notable changes in the severity of the indication “complication becoming sexually aroused.”

Adjusting for functional status as calculated by the Karnofsky scale rendered the difference in the severity of itching between the groups no statistically significant. Modification for these demographic and clinical variables did not unmask differences in overall symptom burden, overall symptom severity, PHQ-9 scores, or QOL scores and did not lessen the modest changes in the bodily purpose subscale of the SF-12.

**Correlations of Symptoms, Depression, and QoL:**

Complete indication burden and total indication severity were connected with depression in both sufferer groups, with PCS scores in sufferers with ESRD and with MCS scores in sufferers with CKD. Depression was strongly connected with MCS scores in both groups. The Cronbach's coefficient for the DSI in sufferers with ESRD was 0.86 and was 0.82 in sufferers with CKD.

**TABLE. 4 Correlations of symptoms, depression, and quality of life**

	PHQ-9		PCS		MCS	
	ESRD	CKD	ESRD	CKD	ESRD	CKD
Total symptom burden %	0.29 <sup>b</sup>	0.34	-0.27 <sup>b</sup>	-0.23	-0.21 <sup>c</sup>	-0.22 <sup>c</sup>
Total symptom severity %	0.28 <sup>b</sup>	0.33 <sup>b</sup>	-0.24 <sup>b</sup>	-0.29 <sup>c</sup>	-0.20	-0.31 <sup>c</sup>
PHQ-9	-	-	-0.31	-0.17	-0.41 <sup>b</sup>	-0.41 <sup>b</sup>

<sup>a</sup>Data denote correlation coefficient (*r*).

<sup>b</sup>*P* < 0.001, <sup>c</sup>*P* < 0.05.

Past trails demonstrated that sufferers accepting maintenance dialysis practicing a mass of bodily and sensitive indications, a particularly high prevalence of unhappiness, and notable deterioration in QOL. The results of the present trail advises that sufferers with advanced CKD who are not dependent on chronic renal replacement therapy experience a comparable overall load of indications and depression and less QOL. These novel grades have an order of important clinical implications for patients and providers.

Despite investigation representing the reduced bodily and psychosocial comfort of sufferers with ESRD, the clinical, treatment, and/or patient-related factors that cause symptoms, depression, and impaired QOL in this patient population remain incompletely understood. While the bodily rigors of dialysis treatment and emotive, social, and occupational influence of this chronic therapy would seem to be likely mediators.

An important loss without a lack of kidney role may be sufficient for patients to develop symptoms, depression, and impaired QOL. Defining whether this communicates to metabolic derangements, recollected uremic toxins, comorbid medical situations, anxiety about the presence of CKD and potential future need for renal replacement therapy, or other factors, is important to facilitate the implementation of appropriate therapy.

Our results have main implications for sufferers with CKD. Sufferers with advanced CKD may be not aware how chronic renal transplantation treatment will affect their psychosocial and physical well-being. The need for chronic dialysis results in a notable altering in lifestyle for many sufferers.

Based on our results, it appears plausible that many sufferers with Chronic Kidney Disease may not show a substantial alteration in psychosocial and/or physical well-being at the transition time. If confirmed in longitudinal trails, sufferers and providers will be able to use this knowledge to make more informed decisions on whether and when to initiate chronic renal transplantation treatment. Approximately 500,000 sufferers in the US accepted chronic renal transplantation treatment, most of who are managed with hemodialysis.

Prior examinations demonstrate that bother some indications and depression are usually under managed in this people. It is now unknown whether similar under therapy of indications exists in sufferers with CKD. Recent analyses advices that 20 million Americans have moderate to advance CKD.

Analogous to patients with ESRD, the care of

those with advanced CKD is focused in large part on the treatment of anemia, bone disease, electrolyte disturbances, and hypertension. Nonetheless, consciousness among renal providers of the high load of indications and depression in the large group of patients with CKD is essential for the implementation of appropriate symptom-alleviating and anti depressive therapies.

Studies evaluating kidney and primary provider awareness and therapy of indications and depression in this sufferer group are warranted, as are struggles to study whether the implementation of treatment changes into improvements in QOL. It should be documented that depression has been linked with impaired QOL and elevated mortality in sufferers' accepting hemodialysis, and may be related with mortality in Chronic Kidney Disease as well.

Confirming that depression is related with adverse results including death in sufferers with CKD is necessary, as are efforts to regulate whether pharmacologic and/or nonpharmacologic therapy for depression can attenuate such adverse effects in the broad spectrum of patients with renal disease. While the SF-36 and PHQ-9 have been utilized before in sufferers with Chronic Kidney Disease, the DSI has not been tested in this sufferer group.

We observed moderate connection between the PHQ-9 and DSI, PCS, and MCS scores. Moreover, the DSI revealed strong internal consistency accuracy in sufferers with CKD. These results advised that with additional studies of its psychometric characteristics, this questionnaire could be used on a broad basis to assess symptoms in patients with CKD.

Sufferers with End Stage Renal Illness were somewhat more likely to report sleep-associated indications, muscle cramps, dry mouth, and lightheadedness. Although these changes did not come across the range of statistical importance after adjustment for multiple comparisons, there is biologic plausibility to such differences that warrants future examination. Similarly, sufferers with ESRD reported lesser scores on the physical function subscale of the SF-36. Although this did not change into

differences in PCS results, this report sheds preliminary light on sub domains of Quality Of Life that may vary b/w these two people.

There are limitations to this study.

Firstly, the sufferer population was comparatively small, which may lessen the generalizability of our results.

Secondly, we excluded patients with severe diseases present together (comorbid) and those not residing at home.

These are exclusion standards that may have unreasonably affected those with ESRD and rendered our dialysis cohort healthier than dialysis patients in general. It should be noticed that the general demographic characters of our ESRD cohort were similar to the US ESRD population, while our CKD cohort comprised a larger number of men compared with the overall population of patients with CKD. Future studies should relate these health-related domains in a much greater and broader sample of ESRD and CKD patients, including those with serious comorbid illness.

Third, the valuation of indications in sufferers on hemodialysis was conducted in patients' homes, rather than during dialysis sessions. It is possible that sufferers on hemodialysis experience more indications at the time of their treatment than in the confines of their home.

However, the DSI ascertains symptoms over the past week, making it likely that patients would integrate both dialysis and non dialysis experiences in their responses.

Lastly, the cross-sectional nature of our trail precluded a valuation of the progress of indications across the spectrum of CKD stages and did not permit us to evaluate the associations of indications, depression, and impaired QOL with serious adverse patient outcomes.

#### 4. CONCLUSION

In conclusion, we observed that sufferers with End Stage Renal Illness on dialysis and those with progressive CKD experience a similar overall burden of physical and emotional symptoms and sadness and comparably low QOL. Given the considerable and well-identified decrements in the psychosocial and physical well-being of sufferers with ESRD receiving chronic renal replacement

therapy, our results advise that important attention should be paid to these health-related domains by clinicians and families in the large and growing number of sufferers who suffer from advanced CKD. Apart from treating the symptoms by drugs, patients should be given motivation for living as they have to undergo dialysis until they receive a new kidney as in ESRD.

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