

# Assessment for Quality of Life for Patients with Chronic Kidney Diseases in Saudi Arabia: A Cross-Sectional Study

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## ABSTRACT

**Introduction:** Studying the quality of life (QoL) for patients with Chronic Kidney Disease (CKD) is crucial as it provides insights into their well-being, treatment effectiveness, and healthcare needs. Understanding factors affecting QoL can lead to improved patient care and interventions tailored to enhance their overall quality of life.

**Objective:** To examine the QoL of patients with CKD in Saudi Arabia.

**Method:** An online survey study was conducted between December 2023 and March 2024 to collect data from CKD patients. The survey was distributed through various social media websites, targeting individuals diagnosed with CKD. Participants were asked about their demographics, CKD diagnosis, treatment, and various aspects of their quality of life. The survey aimed to gather insights into the factors influencing QoL among CKD patients.

**Results:** A total of 302 patients participated in this study. The majority of patients with CKD rated their life in general as "Good" (63.6%). Regarding enjoyment of life, most patients reported an "Average degree" (58.3%). The aspects of life with the highest negative impact on patients with CKD are daily activities (65.9%), work or study (60.9%), and psychological condition and balance (60.9%). Aspects that were more severely affected among patients with CKD are hypertension (27.2% severe), edema (20.9% severe), and shortness of breath (8.9% severe).

**Conclusion:** The study highlights the significant impact of CKD on patients' quality of life. Recommendations include tailored interventions to address the negative impact on daily activities, work or study, and psychological well-being. Healthcare providers should pay particular attention to managing hypertension, edema, and shortness of breath, which were identified as severely affecting patients.

**Keywords:** Chronic Kidney Disease; Quality of Life; Saudi Arabia; Survey

## INTRODUCTION

Chronic kidney disease (CKD) is characterized by continuous declined kidney function or kidney damage for a minimum of three months, regardless of the underlying reason<sup>1</sup>. CKD is a considerable global health concern<sup>2-4</sup>, with the increasing burden globally<sup>5</sup>. CKD affects 10% of the international population or more than 800 million individuals worldwide<sup>6</sup>. The number of Disability-adjusted life years (DALYs) and the number of new cases of CKD has risen by more than twofold between 1990 and 2019, with the DALYs crossing 40 million<sup>5</sup>.

The increasing prevalence of diabetes, hypertension, and obesity are considerable contributors to the burden of CKD; these well-known traditional risk factors for CKD have a prominent role in the prevalence of CKD<sup>7-9</sup>. In the Arab world, the prevalence of the three crucial risk factors for CKD – obesity, hypertension, and diabetes – is notably high, exceeding levels seen in other regions<sup>10</sup>. In Saudi Arabia, there is an expanding crisis of CKD due to an elevated prevalence of risk factors like hypertension and diabetes<sup>11</sup>; there has been a significant increase in diabetes cases, and about 22.7% of the population is affected by hypertension<sup>12</sup>. A prior study conducted in Saudi Arabia found that 82.7% of CKD patients were either obese or overweight<sup>13</sup>. CKD is estimated to affect about 24% of the population in Saudi Arabia<sup>14</sup>. Still, there remains a poor level of public awareness and understanding of CKD in Saudi Arabia<sup>15</sup>.

There are often serious consequences linked to CKD, which involve increased risk for morbidity, mortality, CVD, acute kidney injury, healthcare costs, and compromised quality of life (QoL)<sup>16-18</sup>. CKD impacts a wide range of perspectives, from the patient's QoL to the national development, overall societal, and family income<sup>19-22</sup>. Advanced stages of the disease pose a significant threat to the QoL of people<sup>23</sup>.

The quality of treatment is strongly linked to QoL for patients suffering from end-stage renal disease (ESRD) and CKD. The adaptation to CKD represents a complex interaction of social, psychological, and physical factors, which considerably affect the outcomes for the patient<sup>24</sup>. Health-related QoL (HRQoL) has often been found to decrease in patients suffering from chronic diseases like CKD. These observations underline the development of HRQoL advancement as a goal of healthcare and research for these diseases<sup>25</sup>. Measurement of HRQoL will aid patients in comprehending their illness and the potential effects of their therapy on their health<sup>26</sup>.

Assessment of the QoL of CKD patients is necessary for determining the broader impacts of the disease and guiding improvements in patient care. In Saudi Arabia, the prevalence of CKD and its risk factors is remarkably high; hence, knowing how CKD impacts the QoL of the affected patients is critical. Therefore, this study aimed to examine the QoL for patients with CKD in Saudi Arabia.

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## METHODS

### Study design

An online survey study was conducted between December 2023 and March 2024 to collect data from CKD patients.

### Sampling procedure

Convenience sampling technique was employed to recruit the sample for this investigation. This method of sampling falls under the classification of non-probability sampling. This research comprised eligible patients who met our inclusion criteria and were willing to participate. On the first page of the questionnaire, patients were presented with an informed consent form and given the option to continue or discontinue. To ensure that the patients understood the significance of their involvement, the study's objectives were presented in detail. In the invitation letter for the study, the inclusion criteria were specified.

### Study population and recruitment

This study's population consisted of patients with CKD who were 18 years or older. There were no exclusion criteria based on gender, age, severity or disease duration. The survey link was shared on social media platforms to invite those with CKD to participate.

### Questionnaire tool

The questionnaire tool for this study was developed based on previous literature. The questionnaire tool examined patients' demographic characteristics (age, area of residency, gender, education, employment status, family monthly income, marital status, and disease history). Besides, the questionnaire tool collected information related to patients' quality of life, the impact of chronic kidney disease on aspects of life, the impact of illness on aspects of physical health, and evaluated treatment therapy aspects.

### Ethical approval

The study was approved by the Research Ethics Committee at King Faisal University, Saudi Arabia (KFU-REC-2023- NOV – ETHICS1628). This study was performed in accordance with the principles stated in the Declaration of Helsinki. All participants gave their consent before being involved in this study.

### Statistical analysis

This study's data were analyzed using version 29 of the SPSS program. Descriptive statistics were used to present the study findings. Categorical variables were presented as frequencies and percentages.

## RESULTS

Table 1 below show patients' demographic characteristics. A total of 302 patients participated in this study. The vast majority of the patients (91.4%) were aged 51 years and older. Around 79.1% of the patients reported that they live in the Western region of Saudi Arabia. The majority of the patients (75.2%) were males. More than half of the patients (53.0%) reported that they have bachelor degree. Around 41.4% of the patients reported that they work outside the healthcare sector. Around half of the patients (50.3%) reported that their family monthly income level is more than 7500 SAR. Around 63.6% of the patients were married. The vast majority of the patients (94.7%) reported that they have other comorbidities.

**Table 1.** Patients' demographic characteristics

Variable	Frequency	Percentage
<b>Age groups</b>		
18-25 years	2	0.7%
26-35 years	5	1.7%
55-36 years	19	6.3%
51 years and older	276	91.4%
<b>Area of residency</b>		
Eastern region	13	4.3%
Western region	239	79.1%
Central region	7	2.3%
Northern region	22	7.3%
Southern region	21	7.0%
<b>Gender</b>		
Females	75	24.8%
Males	227	75.2%
<b>Education:</b>		
Primary school or lower	59	19.6%
Intermediate school	12	4.0%
High school	51	16.9%
Bachelor degree	160	53.0%
Higher education	20	6.6%
<b>Employment status</b>		
Student	4	1.3%
Retired	91	30.1%
Unemployed	69	22.8%
Working in the healthcare sector	13	4.3%
Working outside the healthcare sector	125	41.4%
<b>Family monthly income</b>		
2500 SAR and lower	57	18.9%
2501-5000 SAR	41	13.6%
5001- 7500 SAR	52	17.2%
More than 7500 SAR	152	50.3%
<b>Marital status</b>		
Married	192	63.6%
Divorced	23	7.6%
Single	19	6.3%
Widowed	68	22.5%
<b>Do you have comorbidities?</b>		
Yes	286	94.7%

### Patients' quality of life

Table 2 below show patients' quality of life. The majority of patients with CKD rated their life in general as "Good" (63.6%) or "Very good" (17.5%). Regarding enjoyment of life, most patients reported an "Average degree" (58.3%) or "A lot" (31.8%) of enjoyment. In terms of satisfaction with how they spend their time, the majority were either "Satisfied" (81.1%) or "Very satisfied" (13.2%), with a minority stating they were "Not satisfied" (5.6%). Before being diagnosed with CKD, most patients rated their overall health as "Good" (60.3%) or "Excellent" (11.6%). After the CKD diagnosis, fewer patients reported feeling better, with only 5.6% stating they "Feel much better" and 20.2% saying they "Feel better." A larger percentage (42.1%) reported "No change" in their health, while a substantial portion (32.1%) indicated their condition had worsened.

**Table 2.** Patients' quality of life

Variable	Frequency	Percentage
<b>How do you evaluate your life in general?</b>		
Very good	53	17.5%
Good	192	63.6%
Neutral	50	16.6%
Bad	6	2.0%
Very bad	1	0.3%
<b>How much do you enjoy life?</b>		
Extreme degree	2	0.7%
A lot	96	31.8%
Average degree	176	58.3%
A little	28	9.3%
<b>How satisfied are you with the way you spend your time?</b>		
Very satisfied	40	13.2%
Satisfied	245	81.1%
Not satisfied	17	5.6%
<b>How did you rate your overall health before you were diagnosed with chronic kidney disease?</b>		
Excellent	35	11.6%
Good	182	60.3%
Acceptable	81	26.8%
Not acceptable	4	1.3%
<b>How do you rate your overall health after being diagnosed with chronic kidney disease?</b>		
I feel much better	17	5.6%
I feel better	61	20.2%
No change	127	42.1%
My condition worsened	97	32.1%

**The impact of chronic kidney disease on aspects of life**

Table 3 below presents patients' response to items that examined the impact of chronic kidney disease on aspects of life. The aspects of life with the highest negative impact on patients with CKD are daily activities (65.9%), work or study (60.9%), and psychological condition and balance (60.9%). Other aspects significantly affected include daily vital energy (62.6%), sleep quality (50.7%), and focus and mental health (50.3%). Additionally, the quantity and type of food (47.0%) and travel and leisure activities (55.3%) are areas where patients report notable negative impacts. Conversely, aspects such as marital relationship (32.8%), quantity and type of fluids (52.6%), and religious activities (61.6%) are perceived more positively, with lower negative impacts.

**Table 3.** The impact of chronic kidney disease on aspects of life

Life aspect	Negative impact	No impact	Positive impact
Work or study	60.9%	37.1%	2.0%
Personal care	33.8%	63.9%	2.3%
Sleep quality	50.7%	48.7%	0.7%
Psychological condition and balance	60.9%	36.4%	2.6%
Daily activities	65.9%	30.8%	3.3%
Quantity and type of food	47.0%	32.1%	20.9%
Quantity and type of fluids	20.9%	26.5%	52.6%
Relationships and social activities	23.2%	50.3%	26.5%
Your personal hobbies	21.9%	67.2%	10.9%
Marital relationship	15.6%	51.7%	32.8%

Mobility	16.6%	80.1%	3.3%
Daily vital energy	62.6%	28.5%	8.9%
Focus and mental health	50.3%	39.4%	10.3%
Travel and leisure activities	55.3%	33.1%	11.6%
Religious activities such as prayer and fasting	20.9%	17.5%	61.6%

**The impact of illness on aspects of physical health**

Table 4 below presents the impact of illness on aspects of physical health. Aspects that were more severely affected among patients with CKD are hypertension (27.2% severe), edema (20.9% severe), and shortness of breath (8.9% severe). These aspects show a higher percentage of severe impact compared to others such as pain (6.3% severe), weight (8.3% severe), anemia (2.6% severe), and bone health (3.6% severe).

**Table 4.** The impact of illness on aspects of physical health

Variable	Mild	Moderate	Severe
Pain	57.6%	36.1%	6.3%
Weight	56.0%	35.8%	8.3%
Anemia	83.4%	13.9%	2.6%
Bone	78.8%	17.5%	3.6%
Shortness of breath	61.6%	29.5%	8.9%
Edema	39.7%	39.4%	20.9%
Hypertension	36.8%	36.1%	27.2%

**Evaluation of treatment therapy aspects**

Table 5 below presents patients' evaluation of treatment therapy aspects. The majority of patients reported feeling better (55.6%) due to the medications, with a smaller percentage indicating no change (38.7%) and a few feeling that their health is deteriorating (5.6%). In terms of the number of medications, most patients reported taking either a moderate number (4-6 medications, 43.4%) or a few (1-3 medications, 49.3%), with fewer reporting taking too many (7 and above, 7.3%). Regarding side effects, the majority did not suffer from any side effects (58.6%), while some reported symptoms that did not affect their quality of life (29.8%), and a smaller percentage suffered from side effects that negatively impacted their lives (11.6%). Financially, most patients were fully insured for their medicines (85.4%). Treatment availability was reported as always available for a majority of patients (64.9%), with fewer indicating it was sometimes available (33.4%) and very few reporting it as not available (1.7%). Adherence to treatment was high, with 79.1% of patients always committing to it. Most patients reported knowing some information (52.0%) or everything (43.4%) related to the instructions for using medications. Ease of swallowing pills was rated as easy by the majority (61.6%), while 35.4% found it moderate and 3.0% found it difficult. Medication frequency was reported as moderate (2-3 times) by the majority (56.0%), followed by low (once, 39.7%), and high (4 or more times, 4.3%).

**Table 5.** Evaluation of treatment therapy aspects

Variable	Frequency	Percentage
<b>The effect of medications on my life in general:</b>		
I feel better	168	55.6%
I don't feel any change	117	38.7%
I feel that my health is deteriorating	17	5.6%
<b>Number of medications:</b>		
Too much (7 and above)	22	7.3%
Moderate (4-6)	131	43.4%

Little (1-3)	149	49.3%
<b>Side effects associated with the medication:</b>		
I do not suffer from any side effects.	177	58.6%
I suffer from symptoms, but they do not affect the quality of my life.	90	29.8%
I suffer from side effects that affect my life negatively.	35	11.6%
<b>Financial cost of medicines:</b>		
Not-insured	21	7.0%
Partially-insured	23	7.6%
Full insured	258	85.4%
<b>Availability of treatment:</b>		
Not available	5	1.7%
Sometimes available	101	33.4%
Always available	196	64.9%
<b>Adherence to treatment:</b>		
I don't commit	10	3.3%
Sometimes, I commit	53	17.5%
I always commit	239	79.1%
<b>Receive instructions for using medications:</b>		
I don't know it	14	4.6%
I know some information	157	52.0%
I know everything related to it	131	43.4%
<b>Ease of swallowing pills (pill size):</b>		
Easy	186	61.6%
Moderate	107	35.4%
Difficult	9	3.0%
<b>Medications frequency:</b>		
Low (once)	120	39.7%
Moderate (2-3 times)	169	56.0%
High (4 or more)	13	4.3%

## DISCUSSION

In our study, most participants rated their general life as "Good" or "Very good" (81.1%). This high level of QoL differs from the findings in earlier studies across the globe. These indicate that cultural, social, and healthcare-related factors may impact CKD patients' experiences.

For instance, in India, only 24.3% of CKD patients reported their general QoL as good or very good, and overall satisfaction with general health was rated as satisfied or very satisfied among 34.3% of patients<sup>27</sup>. A prior study conducted in Thailand found that CKD patients' QoL at CKD clinics has to be enhanced<sup>28</sup>. A significant decline in QoL was reported across all stages of CKD by studies from India<sup>29</sup>, Nigeria<sup>30</sup>, Ethiopia<sup>31</sup>, and Brazil<sup>17</sup>, suggesting a more marked adverse impact of CKD in these populations compared to our study population. In Malaysia, the advanced CKD stages are associated with lower HRQOL scores<sup>32</sup>. Moreover, QoL degraded in all stages of CKD in hospitalized patients in Saudi Arabia<sup>33</sup>. These underline the importance of contextual factors, including quality of healthcare services, systems of social support, and cultural attitudes toward disease, which may play a significant role in patients' QoL and life satisfaction perceptions.

The high QoL in our study in Saudi Arabia is probably related to several crucial factors. Social support has decreased fatigue and improved sleep quality among hemodialysis (HD) patients in Saudi Arabia<sup>34</sup>, which may increase their overall QoL. Furthermore, spiritual coping and religiosity, in Saudi culture, may associated with better HRQOL in health dimensions among HD patients<sup>35</sup>. Another reason for this is the high quality of care in Saudi Arabia. A significant ratio of HD patients

in Saudi Arabia is ministered by the Ministry of Health in collaboration with external dialysis centers<sup>36</sup>, where quality standards are assured. Moreover, a prior study highlighted that education programs influence several HRQOL dimensions positively<sup>37</sup>.

In our study, treatment adherence was high. Besides, most patients reported knowing some information or everything related to the instructions for using medications. This high level of adherence is of utmost importance for CKD management and is related to better health outcomes and improved QoL. Different prior studies underline that adherence to treatment plays a crucial role in chronic disease care<sup>38-42</sup>. A previous investigation among patients with chronic disorders in Saudi Arabia found that they have moderate medication adherence levels<sup>40</sup>. This is slightly lower than the adherence level among our participants, which could be due to several factors, including education level, clinical characteristics, psychological, and sociodemographics, which were established to affect treatment adherence<sup>38-40</sup>.

Medications non-adherence frequently connected with upsurge in hospitalization and deterioration of disorder<sup>42</sup>. Besides, an earlier study demonstrated that medications non-adherence may lead to a rise in therapeutic complexity and a worsening QoL<sup>41</sup>. Therefore, high adherence to treatment regimens is essential to improve health outcomes and reduce the burden on health systems. In this consideration, educational programs had a crucial role in improving treatment adherence and QOL of CKD patients<sup>43</sup>.

In our study, the majority reported feeling better due to medications. Most patients reported taking a moderate number or a few medications. Besides, the majority did not suffer from any side effects. Still, some reported symptoms that did not affect their QoL and a smaller percentage suffered from side effects that negatively impacted their lives. The positive response to medications highlights the positive medication consequences on the QoL in CKD patients while emphasizing the importance of medication management in minimizing the emergence of adverse effects. Optimizing medication regimens and encouraging collaboration with healthcare providers may improve patient outcomes and enhance the QoL for CKD patients. Previous studies have shown the importance of safely using medication in CKD, commenting on the complexity of medication management as kidney function lessens<sup>44</sup>. It supports that medication is key in the prevention of complications (like heart attacks) and slowing the progression of CKD<sup>45</sup>. Additionally, it refers to the persistent medication-related problems experienced by HD patients and how pharmacists play a significant role in managing these problems<sup>46</sup>.

Our study also showed that the majority were "Satisfied" or "Very satisfied" with how they spend their time, with a total of 94.3%, which implies that there is activity carried out to keep the perspective of CKD patients positive in the region. Align with our findings, a prior study showed that life satisfaction was moderate to high among HD patients in Jordan<sup>47</sup>. On the contrary, previous studies reported that CKD patients' daily lives, work or study, and psychological conditions were negatively affected<sup>48-51</sup>. These contrasts may result from differences in the availability of social and recreational activities, patterns of care, and cultural attitudes toward chronic illness, suggesting that CKD patients in Saudi Arabia and Jordan could have better support systems and be more involved in fulfilling activities. The unique cultural practices in religious activities may play a critical role in increased satisfaction with practices time spent by CKD patients. Besides, exercise counseling and programs can benefit CKD patients. According to studies, exercise may enhance the physical capacity of CKD patients irrespective of the treatment they receive<sup>52</sup>.

In our study, most rated their overall health as "Good" or "Excellent" (71.9%) before diagnosis. Fewer reported feeling better after diagnosis, with a larger percentage indicating no change or worsening health. This change in health perception reflects the serious influence of CKD diagnosis on the life and mental health of patients. Consistent with our findings, patients often face mental health problems after being diagnosed with CKD, as indicated by several studies<sup>53</sup>. Symptoms do not appear in the early stages of CKD (appearing in stages 4 or 5)<sup>54,55</sup>, coupled with a lack of public understanding of kidney disorders<sup>55</sup>, making it complex for individuals to understand and accept the diagnosis of CKD<sup>56</sup>. Diagnosis of a chronic condition to those individuals who felt very well and were leading a healthy life comes as a shock, getting with it a range of emotions, including anger, depression, anxiety, and fear<sup>57</sup>.

Coping strategies play a crucial role in the management of the emotional and psychological impacts of a CKD diagnosis. Adaptive coping strategies are marked by positive decision-making to ensure favorable results<sup>58</sup>. These enable the patient to take an active and constructive role in managing their condition. Maladaptive coping strategies are marked by negative behaviors that exacerbate the original stressor and have destructive outcomes on the patient's health<sup>58</sup>. The worsening health status in our study upon diagnosis may be partly due to some of the patient's adoption of maladaptive coping strategies. Previous studies indicate that in end-stage CKD patients, a low HRQOL is significantly linked to raised mortality risk and declined treatment compliance, independent of kidney function<sup>59-61</sup>.

It is necessary to screen people who are at increased CKD risk despite not showing symptoms, which will permit earlier detection<sup>62</sup> and then reduce the psychological and mental distress related to CKD. A prior study<sup>63</sup> showed that earlier detection of CKD, particularly at stage 3, will lead to improved monitoring and management approaches, which can decrease the adverse consequences and delay the progression of CKD.

In our study, daily activities, work or study, and psychological condition were aspects most negatively impacted. Other significantly affected areas include daily vital energy, sleep quality, focus, mental health, quantity and type of food, and travel and leisure activities. These findings agree with prior studies showing that CKD impacts multiple patients' life-related dimensions<sup>29,64-68</sup>. High levels of psychological condition are prevalent in CKD patients due to consequent influences on employment, lifestyle, and relationships, the treatment burden, and reduced cognitive and physical function<sup>69,70</sup>. Fatigue impacts the daily activities of CKD patients regardless of whether patients are in the pre-dialysis stage or receiving HD or PD<sup>71</sup>. Sleep disorders are common among CKD patients and influence the health system and patients<sup>72</sup>. Geographic and sociodemographic are among the factors determining food intake among patients with CKD<sup>73</sup>. Also, a considerable number of differences between CKD and non-CKD patients exist in the intake of some food groups or even within CKD patients, depending on the type of treatment received<sup>73</sup>. HD patients experience significant lifestyle restrictions on personal travel and leisure that impact QoL<sup>74</sup>. Such challenges would require a comprehensive approach to their medical management, psychological support, nutritional counseling, and social interventions. All these would significantly improve the QoL in patients with CKD.

On the other hand, in our investigation, aspects like marital relationship, amount and type of fluids, and religious activities are perceived more positively and less negatively. Indeed, good marital relationships, proper fluid management, and religious activities highlight the need to integrate such supportive factors into the healthcare process of

patients with CKD. Health professionals must consider the role of social support, individualized plans for fluid management, and the incorporation of religious practices into care. By handling these aspects, health professionals will be able to increase the overall QoL of CKD patients, enabling them to cope better with their condition and lead a better QoL.

Our findings align with the literature that describes having a permanent partner or being married as positively associated with mental QoL in advanced CKD patients (stages 4 and 5)<sup>75</sup> and that more reasonable health and QoL, enhanced disease management practices, and better adaptive perceptions of disease for the patients and their partners are associated with elevated marital quality levels<sup>76-80</sup>. These relationships provide emotional support, improve mental well-being, and help patients cope better with their illness.

Regarding the religious activities aspect, the literature has established the role of religiosity on HRQOL for HD patients in Saudi Arabia<sup>35</sup>. For such patients, incorporating religion into the healthcare process is favorably recommended, as it eases the accomplishment of optimal levels of health<sup>35</sup>. Engaging in religious activity may give emotional comfort and provide a sense of community and support, contributing to better mental and emotional well-being.

CKD patients should have careful fluid management to avoid complications. Compliance with dietary fluid and salt restrictions in CKD is a multifaceted problem with environmental, cultural, individual, and social impacts<sup>81</sup>. A correct amount of daily fluid intake must be ensured to diminish fluid overload-related symptoms (such as edema, heart failure, hypertension, abdominal bloating, headaches, and dyspnea) and maintain the stability of kidney functions<sup>82,83</sup>. According to prior case studies, fluid restriction measures are advised to be utilized by nurses to decrease fluid volume overload risk among CKD patients<sup>84</sup>.

Our study revealed that in patients with CKD, hypertension, edema, and shortness of breath were more seriously affected compared to pain, weight, anemia, and bone health. The finding reflects the established impact of CKD on the cardiovascular and fluid balance systems<sup>85,86</sup>. Hypertension is both a cause and a consequence of CKD<sup>87-89</sup>, thus creating a vicious cycle that accelerates damage to the kidneys<sup>90</sup>. Moreover, hypertension is noted to be a common comorbidity in CKD patients<sup>91,92</sup>. In CKD patients, management of hypertension eases the risk of developing cardiovascular disorders and delays the progression of kidney damage<sup>93</sup>.

Furthermore, hypertension, edema, and shortness of breath commonly arise due to fluid overload<sup>94-96</sup>. Because CKD decreases GFR, it impairs water homeostasis<sup>97</sup>, resulting in fluid retention in the body. Fluid overload is a prevalent complication in mild to late stages of CKD<sup>94,98</sup>. It has been considered a significant determinant of impairment of QoL<sup>99</sup>. In the treatment of fluid overload and related diseases, such as edema and hypertension, diuretics are used<sup>100</sup>. Despite the beneficial effect, diuretics are reported to be associated with adverse renal outcomes<sup>101</sup>. Accordingly, proper fluid management and implementation of medical guidelines are crucial to reduce the burden of symptoms and maximize QoL in CKD patients. Improved fluid management with the education and support of the healthcare staff will ensure optimum health.

Pain is prevalent in CKD patients compared to the public population, and indeed, above 60% of HD patients report symptoms of moderate to severe chronic pain<sup>102,103</sup>. Chronic pain is associated with declined QoL<sup>104</sup>. CKD is associated with complex adverse physiological and metabolic changes that cause malnutrition, weight change, anemia, bone diseases,

and other related conditions<sup>105-112</sup>. Although hypertension, edema, and shortness of breath are more affected, pain management, changes in weight, anemia, and bone health are critical to improving QoL for patients with CKD. Therefore, there is a need for a comprehensive and multidisciplinary approach to manage these health aspects, involving collaboration between a nephrologist, dietitian, physiotherapist, and mental health professional.

## CONCLUSION

**The study highlights the significant impact of CKD on patients' quality of life. Recommendations include tailored interventions to address the negative impact on daily activities, work or study, and psychological well-being. Healthcare providers should pay particular attention to managing hypertension, edema, and shortness of breath, which were identified as severely affecting patients.**

## Author Contributions

A.K.A supervised this study in term of methodology, statistical analysis and rafting. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

**Funding:** No fund was received for this study.

## Ethics Approval and Informed Consent:

The study was approved by the Research Ethics Committee at King Faisal University, Saudi Arabia (KFU-REC-2023- NOV – ETHICS1628). This study was performed in accordance with the principles stated in the Declaration of Helsinki. All participants gave their consent before being involved in this study.

**Potential Conflicts of Interest:** None

**Competing Interest:** None

**Acceptance Date:** 11-07-2024

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