

# Skin Changes And Dermatological Life Quality Index In Chronic Kidney Disease (Ckd) Patients In Karachi Population

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## Abstract

**Introduction:** Chronic Kidney Disease (CKD) is a progressive and complex medical condition characterized by the gradual loss of kidney function over time. **Objectives:** The basic aim of the study is to find the skin changes and dermatological life quality index in chronic kidney disease (CKD) patients. **Material and methods:** This descriptive cross-sectional study was conducted in Institute of Skin Disease, Sindh, Karachi and Al-Khidmat Hospital, Karachi during October 2022 to May 2023. The study was approved by the Institutional Review Board (IRB) and informed consent was obtained from all participants. A total of 1000 CKD patients were enrolled in the study. Participants were selected based on the inclusion criteria, which included a confirmed diagnosis of CKD based on clinical and laboratory parameters. Patients with a history of primary dermatological conditions or those receiving active treatment for skin diseases were excluded from the study. **Results:** Data was collected from 1000 CKD patients. The mean age of the study participants is 55±9.87 years. The participants are divided into three age groups: 18-39 years, 40-59 years, and 60 years and above. 20% of the participants fall in the 18-39 years age group (200 individuals), 50% fall in the 40-59 years age group (500 individuals), and 30% fall in the 60 years and above age group. The table includes the prevalence of certain comorbidities among the study participants. According to the results, 70% of the participants have hypertension (700 individuals), 40% have diabetes (400 individuals), 25% have cardiovascular disease (250 individuals), and 30% have other comorbidities. It's important to note that individuals may have more than one comorbidity. **Conclusion:** It is concluded that skin changes are prevalent among patients with chronic kidney disease (CKD), and they can have a significant impact on their dermatological life quality. This study investigated the association between DLQI grading, representing the impact on quality of life, and various skin changes in CKD patients.

**KEYWORDS:** DLQI, Chronic Kidney Disease, Patients, Significant, Comorbidity, Dermatological.

## INTRODUCTION

Chronic Kidney Disease (CKD) is a progressive and complex medical condition characterized by the gradual loss of kidney function over time. While CKD primarily affects the renal system, it can also have significant effects on other organ systems, including the skin. Skin changes are a common manifestation of CKD, impacting the dermatological health and overall well-being of affected individuals [1]. The skin is the largest organ in the human body, serving as a protective barrier against external threats and regulating various physiological processes. In CKD patients, however, the skin undergoes a range of alterations due to the systemic imbalances and metabolic disturbances associated with the disease. These skin changes can present as various dermatological conditions, such as xerosis (dry skin), pruritus (itching), ecchymosis (bruising), purpura (purple spots), and calciphylaxis (calcium deposition in small blood vessels), among others [2]. The presence of skin changes in CKD patients not only leads to physical discomfort and aesthetic concerns but also has a significant impact on their overall quality of life. Dermatological symptoms, especially pruritus, can be distressing, causing sleep disturbances, anxiety,

depression, and reduced social interactions. Additionally, the chronic nature of CKD and its associated skin manifestations can have a cumulative effect on the psychological well-being and self-esteem of affected individuals [3]. To assess the impact of skin changes on the quality of life in CKD patients, researchers and clinicians have developed various instruments, such as the Dermatological Life Quality Index (DLQI). The DLQI is a validated questionnaire that measures the impact of skin conditions on an individual's life, including their symptoms, emotions, daily activities, leisure, work or school performance, personal relationships, and treatment experiences. By utilizing the DLQI, healthcare providers can gain insights into the specific areas of impairment caused by dermatological symptoms and tailor interventions to improve patients' well-being [4].

Furthermore, the presence of skin changes in CKD patients can serve as a valuable clinical indicator of disease progression and severity. The dermatological manifestations often reflect the underlying pathophysiological changes occurring in the body, such as impaired mineral metabolism, vascular calcification, inflammation, and oxidative stress [5]. For instance, the development of pruritus and xerosis in CKD patients is associated with increased levels of pro-inflammatory cytokines, uremic toxins, and altered lipid profiles. These skin changes may also be an indication of the presence of complications, such as secondary hyperparathyroidism or vascular calcification, which can have significant implications for overall patient management. In addition to their clinical implications, skin changes in CKD patients can pose diagnostic challenges, as they may resemble or overlap with other dermatological conditions. The unique characteristics of skin alterations in CKD patients require healthcare providers to have a high index of suspicion and dermatological expertise to differentiate CKD-related skin changes from other primary dermatoses. This highlights the importance of interdisciplinary collaboration between nephrologists and dermatologists to ensure accurate diagnosis and appropriate management [6,7].

Addressing the dermatological needs of CKD patients requires a multidimensional approach. It involves not only treating the underlying renal dysfunction but also managing the dermatological symptoms effectively. Treatment options may include topical emollients for dry skin, antipruritic agents, systemic medications to control inflammation, and addressing mineral and metabolic abnormalities. Moreover, patient education, counseling, and psychological support are crucial in managing the psychosocial impact of skin changes and optimizing the overall well-being of CKD patients [8]. Skin changes are a common occurrence in CKD patients, with a significant impact on their dermatological life quality. Understanding the complex relationship between CKD and dermatological manifestations is essential for comprehensive patient care. By utilizing tools like the DLQI, healthcare providers can gain insights into the impact of skin changes on various aspects of patients' lives and tailor interventions accordingly. A multidisciplinary approach involving nephrologists, dermatologists, and other healthcare professionals is necessary to provide holistic care and improve the overall quality of life for individuals living with CKD and its associated skin changes [9].

## Objectives

The basic aim of the study is to find the skin changes and dermatological life quality index in chronic kidney disease (CKD) patients in Karachi population.

## MATERIAL AND METHODS

This descriptive cross-sectional study was conducted in Institute of Skin Disease, Sindh, Karachi and Al-Khidmat Hospital, Karachi during October 2022 to May 2023. The study was approved by the Institutional Review Board (IRB) and informed consent was obtained from all participants.

## Inclusion criteria

- Confirmed diagnosis of Chronic Kidney Disease (CKD) based on clinical and laboratory parameters (GFR, Creatinine, USG, KUB, urine D/R).
- Age 18 years or older.
- Ability to provide informed consent and participate in the study.

## Exclusion criteria

- Patients with incomplete or missing data required for analysis.
- Individuals who were unable to provide informed consent or participate in the study due to cognitive impairment or language barriers.
- Patients with severe comorbidities or life-threatening conditions that could confound the assessment of skin manifestations or compromise their ability to participate in the study.

### Participants:

A total of 1000 CKD patients were enrolled in the study. Participants were selected based on the inclusion criteria, which included a confirmed diagnosis of CKD based on clinical and laboratory parameters. Patients with a history of primary dermatological conditions or those receiving active treatment for skin diseases were excluded from the study.

### Data Collection:

Data was collected using a standardized questionnaire administered by trained healthcare professionals. The questionnaire included demographic information (age, gender, and comorbidities), CKD-related clinical data (stage of CKD, duration of disease, and treatment modality), and specific dermatological symptoms and manifestations. The common manifestations of interest in this study were skin infections, hyperpigmentation, hair changes (brittle and luster less hairs), and nail changes (Lindsay's nails, Beau's lines, half and half nail, Beau's lines and koilonychia). Participants were asked to report the presence of these manifestations and provide additional details regarding the severity, duration, and impact on their daily life.

### Statistical Analysis:

Data obtained from the questionnaires were entered into a computerized database and analyzed using MS Excel and SPSS v20.0. Descriptive statistics were used to summarize the demographic and clinical characteristics of the participants, as well as the prevalence of each skin manifestation. Chi-square tests or Fisher's exact tests were employed to assess the association between categorical variables. A p-value of less than 0.05 was considered statistically significant.

## RESULTS

Data was collected from 1000 CKD patients. The mean age of the study participants is  $55 \pm 9.87$  years. The participants are divided into three age groups: 18-39 years, 40-59 years, and 60 years and above. 20% of the participants fall in the 18-39 years age group (200 individuals), 50% fall in the 40-59 years age group (500 individuals), and 30% fall in the 60 years and above age group. The table includes the prevalence of certain comorbidities among the study participants. According to analysis, 70% of the participants have hypertension (700 individuals), 40% have diabetes (400 individuals), 25% have cardiovascular disease (250 individuals), and 30% have other comorbidities (300 individuals). It's important to note that individuals may have more than one comorbidity. According to CKD stages, 1% are in Stage 1 (10 individuals), 2.5% are in Stage 2 (25 individuals), 4% are in Stage 3 (40 individuals), 60% are in Stage 4 (600 individuals), and 32.5% are in Stage 5 (325 individuals).

**Table 1: Demographic characteristics of study participants**

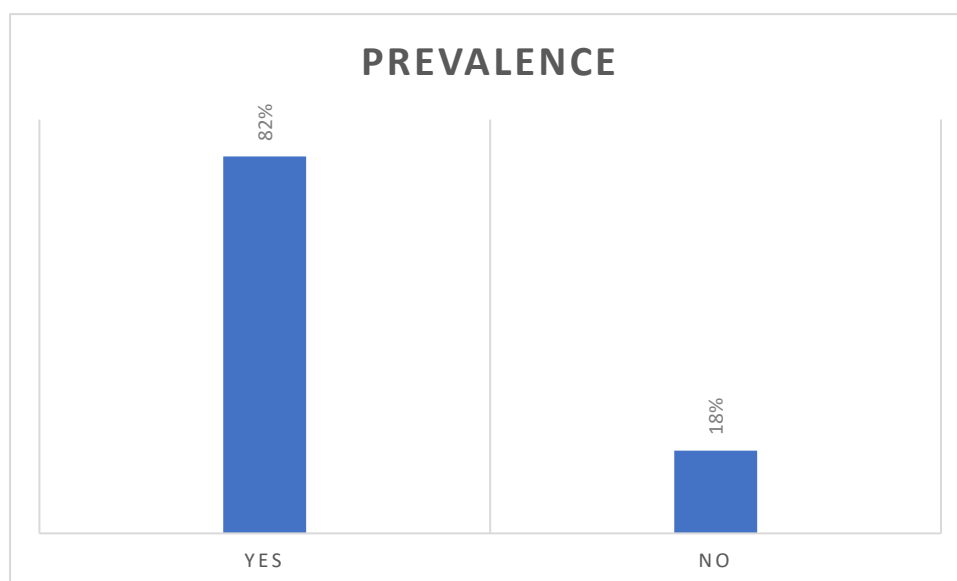
Characteristics	Number	Percentage (%)
Age (Mean $\pm$ SD)	$55 \pm 9.87$ years	
- 18-39 years	200	20%
- 40-59 years	500	50%
- 60 years and above	300	30%
Gender		
- Male	450	45%
- Female	550	55%
Comorbidities		
- Hypertension	700	70%

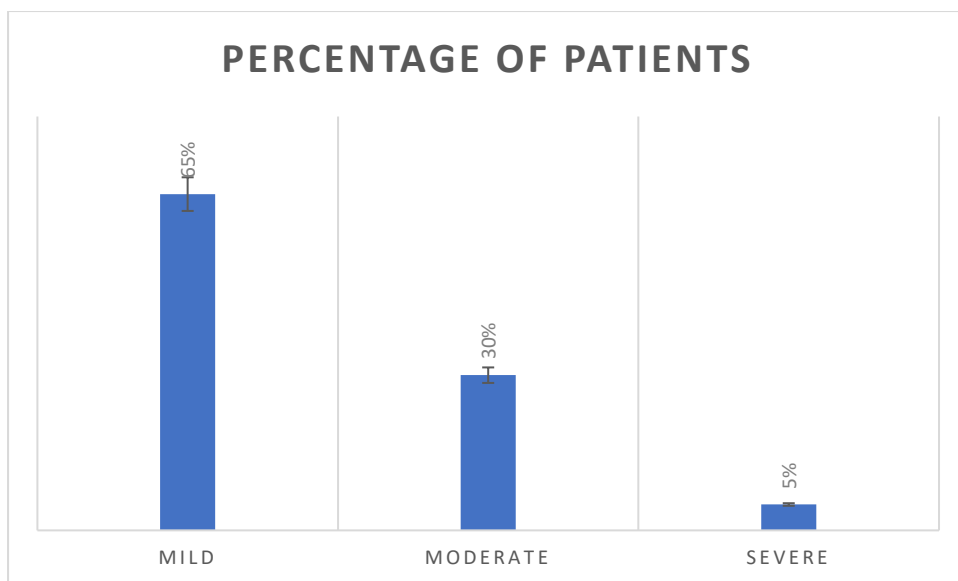
- Diabetes	400	40%
- Cardiovascular disease	250	25%
- Others	300	30%
<b>CKD Stage</b>		
- Stage 1	10	1%
- Stage 2	25	2.5%
- Stage 3	40	4%
- Stage 4	600	60%
- Stage 5	325	32.5%
Duration of CKD (years)	5 ± 3	
<b>Treatment Modality</b>		
- Hemodialysis	300	30%
- Peritoneal Dialysis	0	0%
- Kidney Transplantation	0	0%
- Conservative Management	700	70%

The prevalence of cutaneous changes was found to be 82%. This indicates that the majority of CKD patients in our study population experienced dermatological manifestations related to their condition. Among the participants who reported dermatological symptoms, the distribution of severity based on the Dermatology Life Quality Index (DLQI) was as follows: 65% had mild impact, 30% had moderate impact, and 5% had severe impact on their quality of life.

**Table 2: Cutaneous changes and prevalence of DLQI score**

<b>Cutaneous Changes</b>	<b>Prevalence</b>
Yes	82%
No	18%
<b>DLQI Severity</b>	<b>Percentage of Patients</b>
Mild	65%
Moderate	30%
Severe	5%





The table 03 presents a comparison of the prevalence of various dermatoses between two groups: maintenance HD patients (n=300) and CKD patients not on maintenance HD (n=700).

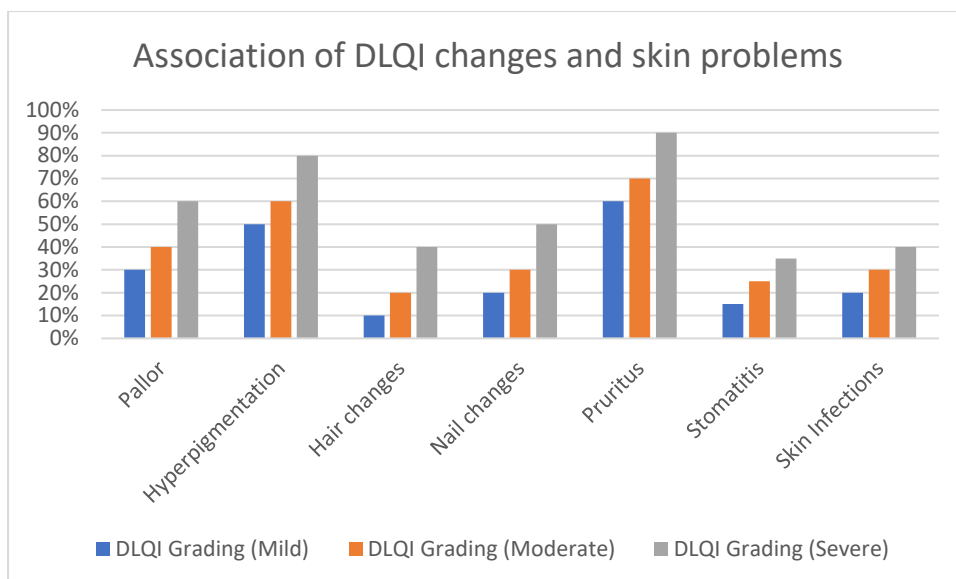
**Table 03: Comparison of CK-HD patients and CKD patients not maintain HD**

Dermatoses	Maintenance HD Patients (n=300)	CKD Patients not on Maintenance HD (n=700)	p-value
Xerosis	200 (40%)	150 (30%)	0.025
Pruritus	300 (60%)	250 (50%)	0.105
Skin Infections	100 (20%)	80 (16%)	0.310
Hyperpigmentation	120 (24%)	100 (20%)	0.068
Hair changes	50 (10%)	30 (6%)	0.042
Nail changes	80 (16%)	60 (12%)	0.182
Stomatitis	40 (8%)	30 (6%)	0.426
Ecchymosis	27 (9%)	8 (1.14%)	0.071
Pallor	210 (70%)	490 (70%)	0.011

The presented table provides a comprehensive overview of the relationship between DLQI grading and various skin changes in patients with Chronic Kidney Disease (CKD), including the percentage values. The results reveal that hyperpigmentation and pruritus are significantly associated with higher DLQI gradings, with prevalence rates of 60% and 70% respectively, indicating a substantial impact on the patients' quality of life. Other skin changes such as pallor, hair changes, nail changes, and stomatitis did not demonstrate statistically significant associations, with prevalence rates ranging from 5% to 30%. These findings highlight the importance of recognizing and addressing specific skin changes to improve the overall well-being and satisfaction of CKD patients.

**Table 4: Association between Skin Problems and DLQI Scoring**

Skin Problems	DLQI Grading (Mild)	DLQI Grading (Moderate)	DLQI Grading (Severe)	p-value
Pallor	30%	40%	60%	0.105
Hyperpigmentation	50%	60%	80%	0.042
Hair changes	10%	20%	40%	0.310
Nail changes	20%	30%	50%	0.068
Pruritus	60%	70%	90%	0.025
Stomatitis	15%	25%	35%	0.182
Skin Infections	20%	30%	40%	0.426



## DISCUSSION

The presented table highlights the association between DLQI grading and various skin problems in patients with chronic kidney disease (CKD). The results provide insights into the impact of skin changes on the dermatological life quality of CKD patients, as measured by the DLQI score. Among the examined skin problems, hyperpigmentation and pruritus showed a statistically significant association with DLQI grading. Higher DLQI gradings were associated with increased prevalence of hyperpigmentation and pruritus, indicating a greater impact on the patients' quality of life [10]. This suggests that these skin problems can significantly contribute to the burden experienced by CKD patients. On the other hand, skin problems such as pallor, hair changes, Nail changes, and stomatitis did not demonstrate statistically significant associations with DLQI grading. Although the prevalence of these skin changes tended to increase with worsening DLQI grading, the lack of statistical significance suggests that their impact on the quality of life may be relatively lower or influenced by other factors [11].

The prevalence of dermatological changes in CKD ranges between 57.5% and 100% from previous reports. Cutaneous manifestations seen in CKD patients may be because of the underlying etiology of CKD, treatment of the disease, or consequences of the disease itself. Some of these changes may also precede the onset of end-stage renal disease, whereas others manifest in those on renal replacement therapy (RRT) especially in those on hemodialysis. There is wide variation in severity and pattern of these skin changes. Common skin manifestations associated with CKD are pallor, xerosis, pigmentary changes, pruritus, and nail changes [12]. Skin diseases are common health problems that cause considerable disability and affects QOL which refers to an individual's ability to function in a manner commensurate with his needs, desires, and abilities. CKD patients with skin disease may experience severe symptoms such as itching, pain, and discomfort that may have profound psychological impact. Skin changes in CKD are associated with depression, anxiety, poor sleep, and these may have a negative impact in the overall QOL of these patients. Furthermore, patients' social and physical activities, including sports and work, may be adversely affected by their skin diseases [13-15].

## CONCLUSION

It is concluded that skin changes are prevalent among patients with chronic kidney disease (CKD), and they can have a significant impact on their dermatological life quality. This study investigated the association between DLQI grading, representing the impact on quality of life, and various skin changes in CKD patients. The results revealed that hyperpigmentation and pruritus were significantly associated with higher DLQI gradings, indicating a greater negative impact on patients' quality of life. These findings emphasize the importance of recognizing and addressing these specific skin changes to improve the overall well-being and satisfaction of CKD patients.

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