

## FREQUENCY OF CHRONIC KIDNEY DISEASE ASSOCIATED PRURITUS AND ITS ASSOCIATION WITH SLEEP QUALITY IN HEMODIALYSIS PATIENTS

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**Abstract:** A cross-sectional study was conducted at the Department of Medicine, Khyber Teaching Hospital Peshawar, between November 2022 and April 2023. The study aimed to evaluate the frequency of pruritus associated with chronic kidney disease (CKD) and its correlation with sleep quality in hemodialysis patients. The study cohort comprised 55 individuals diagnosed with CKD, aged between 18 and 70, and of both genders. Chi-square and Independent Samples T-tests were used for statistical analysis, and a significance level of  $P < 0.05$  was considered statistically significant. The study found that 39 (70.9%) patients reported chronic kidney disease-associated pruritus. Among the pruritus patients, 7.7% reported no effect on their sleep, 43.6% reported occasional sleep, and 48.7% reported severe effects on sleep. The study showed a significant association between increasing age and pruritus ( $P = 0.0001$ ) but no significant association between pruritus and gender ( $P = 0.23$ ). The mean age of the patients was  $40.8 \pm 14.12$  years. The study concluded that the prevalence of pruritus in hemodialysis patients with chronic kidney disease was very high. Also, pruritus in individuals with chronic renal disease significantly correlated with sleep quality and advancing age among hemodialysis patients.

**Keywords:** Chronic Kidney Disease, Pruritus, Sleep Quality

### Introduction

Chronic kidney disease (CKD) is a global health concern affecting millions of individuals, and among its most debilitating complications is the development of end-stage renal disease (ESRD) (Wiliyanarti and Muhith, 2019). Hemodialysis, a life-sustaining renal replacement therapy, becomes a lifeline for those with ESRD, providing essential filtration functions that the kidneys can no longer perform (Evangelidis et al., 2017). However, hemodialysis patients often face various physical and psychological challenges, with one particularly distressing symptom being pruritus, commonly known as itching (Panzeri and Ferrario, 2020). Pruritus in hemodialysis patients is a multifaceted and pervasive issue that has gained increasing recognition recently. Itching can manifest as a maddening, persistent sensation, often involving the skin and sometimes with no identifiable external cause. While the exact mechanisms underlying uremic pruritus remain complex and not entirely elucidated, it is widely acknowledged as a significant quality-of-life concern for individuals undergoing hemodialysis (Altınok Ersoy and Akyar, 2019; Fishbane et al., 2020).

One of the most insidious aspects of pruritus in this context is its potential to disrupt sleep patterns and, consequently, impair sleep quality (Ozen et al., 2018). Sleep disturbances are highly prevalent among hemodialysis patients, often caused or exacerbated by restless leg syndrome, obstructive

sleep apnea, and nocturnal hypertension. Pruritus, however, has emerged as a crucial contributor to sleep disruptions in this population, further exacerbating the already substantial burden of CKD and its treatments (Rehman et al., 2019).

Pruritus-induced sleep disturbances can severely compromise hemodialysis patients' overall quality of life, impacting their physical, emotional, and social well-being (Pereira and Ständer, 2017). Recognizing the impact of pruritus on sleep quality underscores the importance of proactive symptom management, not only for itching but also for improving sleep patterns and overall health outcomes (Haq et al., 2022). Insights into the relationship between pruritus and sleep quality may guide the development of targeted interventions, potentially alleviating symptoms and enhancing patient well-being. A deeper understanding of how pruritus affects sleep quality fosters patient-centered care approaches, emphasizing holistic symptom management and patient education (Mehrpooya et al., 2020).

This study will serve as a foundation for an in-depth exploration of pruritus-associated sleep disturbances in hemodialysis patients. By examining the existing body of research, investigating potential mechanisms, evaluating clinical interventions, and considering the broader implications for patient care, this investigation aims to illuminate the intricate relationship between pruritus and sleep quality. Ultimately, this knowledge can empower

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healthcare providers to optimize the management of these interconnected symptoms, enhance patient comfort, and improve the overall experience of hemodialysis for individuals living with CKD on hemodialysis.

**Methodology**

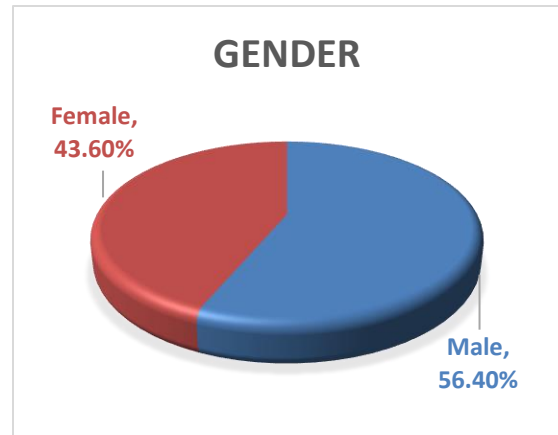
A six-month cross-sectional study was undertaken at the Department of Medicine, Khyber Teaching Hospital Peshawar, from November 2022 to April 2023, involving a cohort of 55 patients diagnosed with chronic kidney disease (CKD) aged between 18 to 7- years of either gender, spanning from February 2023 to September 2023. The study included patients diagnosed with chronic renal illness who exhibited symptoms of rashes and pruritus. Conversely, patients who experienced rashes and pruritus unrelated to chronic kidney disease (CKD) and caused by other medical conditions were not considered for inclusion in the study. All patients provided information regarding their age, gender, pruritus, and sleep quality. The data underwent analysis using SPSS 22, which involved the calculation of frequencies and percentages for categorical data, as well as the determination of mean and standard deviation for continuous data. The Chi-square test was employed to assess the relationship between variables. Pruritus was assessed using the 5-D itching scale, while sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) test.

Data was analyzed using IBM SPSS 24. Mean and standard deviation were used numerically, while frequencies and percentages were assessed for qualitative variables. Chi-square and Independent Samples T-tests were used for association, keeping a P value < 0.05 as significant.

**Results**

The present investigation was conducted on 55 individuals diagnosed with chronic renal disease undergoing hemodialysis treatment. The average age of the patients was 40.8±14.12 years. Based on the gender distribution, our study observed that 56.4% of the patients were male, while 43.6% were female. About the coexisting medical disorders,

it was revealed that 23.6% of the patients exhibited diabetes, while 36.4% presented with hypertension. The prevalence of pruritus associated with chronic renal disease was 39 cases, accounting for 70.9% of the population studied. Out of a cohort of 39 individuals experiencing pruritus, 7.7% indicated no discernible impact on their sleep, while 43.6% reported occasional disruptions to their sleep patterns. The remaining 48.7% of patients conveyed that pruritus significantly and adversely affected their sleep. A substantial correlation was seen between advancing age and pruritus (P = 0.0001), but no significant correlation was detected between pruritus and gender (P = 0.23).



**Figure 1 Gender distribution**

**Table 1: Frequency of chronic kidney disease associated pruritus**

Chronic kidney disease-associated pruritus	Frequency	Percent
Yes	39	70.9
No	16	29.1
Total	55	100.0

**Table 2: Association of chronic kidney disease associated pruritus with sleep quality**

		Effect on sleep quality			Total	P-value
		Does not affect sleep	Occasionally effects sleep	Severely effects sleep		
Pruritus	Yes	3 7.7%	17 43.6%	19 48.7%	39 100.0%	0.0001
	No	15 93.8%	0 0.0%	1 6.2%	16 100.0%	
Total		18 32.7%	17 30.9%	20 36.4%	55 100.0%	

**Discussion**

The presence of pruritus poses a complex problem that has a substantial impact on the sleep quality of patients afflicted with CKD (Shirazian et al., 2017). Pruritus associated with CKD is a pathological state characterized by pruritus, or

itchy, that has a negative impact on the quality of sleep. Previous studies have demonstrated that the prevalence of pruritus in individuals with pruritus associated with CKD ranges from 40% to 70% (Mistik et al., 2006). Sleep disruptions associated with CKD-aP have been reported to occur in a range of 28.8% to 90% (Takahashi et al., 2016).

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**Table 3: Association of chronic kidney disease associated pruritus with gender**

		Gender		Total	P value
		Male	Female		
Pruritus	Yes	20 51.3%	19 48.7%	39 100.0%	0.23
	No	11 68.8%	5 31.2%	16 100.0%	
Total		31 56.4%	24 43.6%	55 100.0%	

**Table 4: Association of chronic kidney disease associated pruritus with age**

Age (Years)	Pruritus	N	Mean	Std. Deviation	P value
	Yes	39	46.41	11.800	
No	16	27.13	9.164		

Pruritus associated with CKD has been recognized as a contributing factor to instances of nocturnal awakenings and challenges in initiating sleep. It is worth mentioning that research has demonstrated a correlation between moderate to severe pruritus in patients undergoing hemodialysis and a higher likelihood of experiencing poor sleep quality, with the former group being three times more susceptible to this issue. A research investigation revealed that pruritus was observed in 66.9% of individuals undergoing hemodialysis treatment. Furthermore, among this group, 41.2% reported experiencing sleep difficulties associated with pruritus. Moreover, evidence suggests that those who experience compromised sleep quality due to moderate to severe pruritus are at an increased likelihood of mortality (Zucker et al., 2003). In individuals diagnosed with Stage 5 CKD, a significant proportion of 61% reported encountering challenges in initiating sleep due to pruritus, also known as itching (Sheikh et al., 2014). Additionally, 44% of these patients observed disturbances in their sleep patterns specifically attributed to itching sensations. The prevalence of pruritus associated with CKD in Pakistan varies between 64.64% and 77.7% (Pisoni et al., 2006). An independent study examined the incidence of moderate to severe pruritus resulting from CKD (Study et al., 2005). The study found that the prevalence of this condition was 45% in hemodialysis patients, which took place from 1996 - 2001. In the subsequent DOPPS II study, conducted from 2002 to 2004, the prevalence of moderate to severe pruritus decreased somewhat to 42%. Nevertheless, a considerable proportion of patients, namely 45%, expressed dissatisfaction with the quality of their sleep. There is a strong correlation between inadequate sleep quality and a heightened likelihood of experiencing hypertension, chronic kidney disease-associated anemia of inflammation, impaired glucose tolerance, diabetes mellitus, depression, reduced health-related quality of life, increased mortality rates, and more consumption of healthcare services (Rehman et al., 2018).

Pruritus associated with CKD has been identified as a highly frequent consequence among persons undergoing hemodialysis. Previous studies have documented a wide range of prevalence rates for CKD-associated pruritus among individuals undergoing hemodialysis, with reported figures ranging from 22% to 84%. The present study aimed to ascertain the prevalence rate of pruritus associated with

CKD, which was found to be 70.9%. Our results agree with a study that reported a prevalence of pruritus 74%<sup>18</sup>.

We observed that pruritus was significantly associated with increasing age; our findings are in comparison with the aforementioned study, which also reported pruritus being associated with age (Kim et al., 2010).

In our study, 7.7% of patients with pruritus reported that pruritus did not affect their sleep, around 43.6% reported that it occasionally affects their sleep, while 48.7% reported that it severely affects their sleep. We found a significant association between pruritus and its effects on sleep (P = 0.0001).

**Conclusion**

Based on our research findings, it can be inferred that pruritus, a symptom commonly observed in individuals with chronic kidney disease (CKD) undergoing hemodialysis, exhibits a high prevalence. Moreover, our study reveals a substantial correlation between pruritus associated with CKD, sleep quality, and advancing age among hemodialysis patients.

**Declarations**

**Data Availability statement**

All data generated or analyzed during the study are included in the manuscript.

**Ethics approval and consent to participate**

Approved by the department Concerned.

**Consent for publication**

Approved

**Funding**

Not applicable

**Conflict of interest**

The authors declared absence of conflict of interest.

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