

# The correlation between pruritus and xerosis with the quality of life of patients undergoing hemodialysis in Atma Jaya Hospital

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## Abstract

Pruritus and xerosis cutis are the most common symptoms of chronic kidney disease (CKD), of which the pathophysiology remains unclear to date. We conducted this study to assess the impact of these condition on the quality of life of the CKD patients who undergoing hemodialysis. This cross-sectional descriptive research studied 39 patients in the Hemodialysis Unit of Atma Jaya Hospital in August 2019. The pruritus and xerosis severity were assessed by the 5-D Pruritus Scale and Overall Dry Skin score (ODS), respectively. The DLQI questionnaire measured patients' quality of life. All subjects had xerosis cutis, and 46.2% suffered pruritus. A strong significant positive correlation was found between pruritus and xerosis cutis scores with the degree of quality of life of the subjects ( $r=0.923$  dan  $r=0.620$ ;  $p=0.000$ ). We concluded that the more severe pruritus and xerosis cutis would negatively impact CKD patients' quality of life undergoing hemodialysis.

## Key words

DLQI, hemodialysis, quality of life, pruritus, xerosis.

## Introduction

Pruritus is a common symptom of chronic kidney disease (CKD) patients undergoing hemodialysis, with a 50-90% prevalence.<sup>1,2</sup> Pruritus generally occurs 3-6 months after hemodialysis onset, but several patients experience it before the start of the hemodialysis therapy.<sup>3</sup> Onset, duration, and intensity of pruritus can change throughout the hemodialysis period, but the symptom generally worsens during the night and often happens on the back,

extremity, chest, and head area. Around 20-50% of patients experience generalized pruritus.<sup>1</sup>

Xerosis cutis occurs in around 85% of patients with CKD and generally worsens before the onset of hemodialysis therapy.<sup>4</sup> Xerosis is presumed to be caused by a decrease in water content within the stratum corneum, disturbance in sebum production due to sebaceous gland atrophy, and decrease in dermis layer water content caused by fluid displacement during the dialysis process.<sup>4</sup>

Pruritus and xerosis cutis may lead to discomfort, which affects the quality of life in patients.<sup>1</sup> Pruritus and xerosis cutis in patients undergoing hemodialysis are often taken lightly and not managed thoroughly. Data regarding the impact of pruritus and xerosis on patients'

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quality of life with CKD in Indonesia was scarce. This study aimed to better understand the impact of pruritus and xerosis on CKD patients' quality of life undergoing hemodialysis therapy.

## Methods

This study was a descriptive cross-sectional study on patients in the hemodialysis unit in Atma Jaya Hospital in August 2019. Sample collection was conducted by interview on all patients with CKD undergoing hemodialysis therapy in Atma Jaya Hospital in August 2019. A total of 39 patients were included in this study. Inclusion criteria consisted of males and females aged above 18 years old, undergoing hemodialysis in the hemodialysis unit in Atma Jaya Hospital in August 2019, present during data collection, and consented to be study subject by signing the informed consent given. Patients with chronic skin disease such as psoriasis and patients with difficulty in communicating were excluded.

The severity of pruritus was assessed using the 5-D Pruritus Scale, while xerosis cutis was assessed by a dermatovenereologist doctor and was classified according to Overall Dry Skin Score (ODS). Quality of life was classified using the Dermatology Life Quality Index (DLQI) questionnaire. All three questionnaires were translated into Bahasa Indonesia and were tested for validity and reliability prior to use.

The 5-D Pruritus Scale is a multidimensional questionnaire used to determine pruritus degree based on five different aspects.<sup>5</sup> Each of five aspects were scored separately and were then summed to obtain the total score. Pruritus was then classified according to the total score,  $\leq 8$  for no pruritus, 9-11 for mild pruritus, 12-17 for moderate pruritus, 18-21 for severe pruritus, and  $\geq 22$  for very severe pruritus.<sup>6</sup> Overall Dry Skin Score is a scoring system developed by the

European Group on Efficacy Measurement of Cosmetics and other Topical Products (EEMCO) to make a clinical assessment on xerosis cutis using a 5 points scale.<sup>7</sup> A score of 0 indicates no skin dryness, whereas a score of 4 indicates skin roughness, large scales, inflammation, and large fissures.<sup>7</sup>

The DLQI questionnaire is a specific measurement tool for the impact of skin conditions on patients' quality of life. The questionnaire consists of six parts questions, which would then be scored, giving a possible score range from 0 to 30. A higher total score means more impact on the quality of life.<sup>8</sup>

Data analysis was done using the Spearman correlation test. The study had been approved by the ethical clearance commission on August 19, 2019, through study ethical clearance letter No: 02/08/KEP-FKUAJ/2019.

## Result

A total of 39 subjects were included in this study. The median for age was 52 years old, with age ranging from 32–79 years old. More than half of the respondents ( $n=20$ , 51.3%) were in the middle-aged group (41–60 years). As many as 27 respondents (69.2%) were male, most had gone through hemodialysis for 1-5 years (66.7%). The sociodemographic of all 39 subjects are shown in **Table 1**.

Based on history taking and dermatologic examination during data collection, there were 21 respondents without pruritus (53.8%), 7 respondents with mild pruritus (17.9%), 8 respondents with moderate pruritus (20.5%), and only 3 respondents with severe pruritus (7.7%). Xerosis was assessed by a dermatovenereologist and was classified according to the Overall Dry Skin Score. Most respondents, 18 patients (36.2%), had severe xerosis, and only 1

**Table 1** Sociodemographic Characteristics of respondents in the Hemodialysis Unit of Atma Jaya Hospital on August 2019 (N=39).

Sociodemographic Characteristics	Total (N=39)	
	N	%
Age (years); median (min-max)	52	(32-79)
Early Adulthood (18-40 year)	6	15.4
Middle Age (41-60 years old)	20	51.3
Elderly (>60 years old)	13	33.3
Gender		
Male	27	69.2
Female	12	30.8
Duration of Hemodialysis		
< 1 year	8	20.5
1-5 years	26	66.7
> 5 years	5	12.8

respondent (2.6%) had very severe xerosis.

**Table 2** shows the degree of pruritus and xerosis of study subjects.

**Table 3** and **Table 4** presented the impact of the degree of pruritus and xerosis cutis on patients' quality of life. Out of 21 subjects without pruritus, 15 subjects were not affected in regards to the quality of life. A severe impact was found only on 1 respondent out of 8 with moderate pruritus. Severe xerosis was experienced by 18 subjects, with 10 of them having a mild impact

**Table 3** Degree of Pruritus and Quality of Life of Respondents in Hemodialysis Unit of Atma Jaya Hospital on August 2019.

Degree of Pruritus	Quality of Life				Total (N=39)
	No Impact	Mild Impact	Moderate Impact	Severe Impact	
No pruritus	15	6	0	0	21
Mild pruritus	1	4	2	0	7
Moderate pruritus	0	4	3	1	8
Severe pruritus	0	2	1	0	3
Total	16	16	6	1	39

**Table 4** Degree of Xerosis and Quality of Life Distribution of Respondents in Hemodialysis Unit of Atma Jaya Hospital on August 2019.

Degree of Xerosis	Quality of Life				Total (N=39)
	No Impact	Mild Impact	Moderate Impact	Severe Impact	
Mild xerosis	9	3	0	0	12
Moderate xerosis	4	3	1	0	8
Severe xerosis	3	10	4	1	18
Very severe xerosis	0	0	1	0	1
Total	16	16	6	1	39

**Table 2.** Degree of Pruritus, Degree of Xerosis cutis, and DLQI Score of Respondents in Hemodialysis Unit of Atma Jaya Hospital on August 2019.

Variables	N	%
5-D Pruritus Scale Score		
Median (min-max)	7	(5-20)
Degree of pruritus		
No pruritus	21	53.8
Mild pruritus	7	17.9
Moderate pruritus	8	20.5
Severe pruritus	3	7.7
ODS Score		
Median (min-max)	2	(1-4)
Degree of xerosis		
Mild xerosis	12	30.8
Moderate xerosis	8	20.5
Severe xerosis	18	46.2
Very severe xerosis	1	2.6
DLQI Score		
Median (min-max)	2	(0-14)

and 1 of them having a severe impact on life quality.

Spearman correlation test was done to find the correlation between the degree of pruritus and xerosis towards the quality of life. The analysis found a strong positive correlation between the degree of pruritus and xerosis cutis score towards subjects' quality of life ( $r=0.923$  dan  $r=0.620$ ;  $p=0.000$ ).

## Discussion

This study aimed to better understand the correlation between the degree of pruritus and xerosis cutis towards CKD patients' quality of life. The prevalence of pruritus in this study was 46.2%, whereas prevalence in previous studies was higher than 50%. A similar study by Rehman *et al.* in Malaysia using the 5-D pruritus scale on 334 CKD patients undergoing hemodialysis found that 205 of the patients experienced pruritus, giving a prevalence of pruritus of 63.1%.<sup>1</sup> The differing prevalence found in this study is thought to be caused by the relatively smaller subjects compared to other studies.

Pruritus can affect the quality of life by causing discomfort and skin excoriation through scratching, affecting social function and sleeping pattern.<sup>2</sup> Multiple studies previously stated that pruritus and xerosis cutis is associated with quality of life.<sup>1-3</sup> Our study demonstrated a strong positive correlation between the degree of pruritus and xerosis cutis towards the quality of life in patients ( $r=0.923$  dan  $r=0.620$ ;  $p=0.000$ ). A higher score of pruritus and xerosis cutis in respondents will increase the DLQI score, which reflected a worse quality of life. A similar finding was reported by Satti *et al.* on 173 male subjects in a hemodialysis unit in Pakistan.<sup>9</sup> There was found to be a strong positive correlation between the Pruritus 5-D and DLQI score ( $r=0.78$ ,  $p<0.000$ ).<sup>9</sup>

Rehman *et al.* using different sets of questionnaires, reported similar correlation findings between pruritus and reduced quality of life in patients with CKD undergoing hemodialysis in Malaysia.<sup>1</sup> According to their study, pruritus in hemodialysis patients caused disturbances in the quality of sleep and social, daily, and work activities.<sup>1</sup> Study by Dupuy *et al.* in Europe on 334 CKD patients undergoing

hemodialysis found that the degree of xerosis cutis had a weak correlation towards a reduced quality of life ( $r=0.14$ ,  $p=0.013$ ).<sup>10</sup> Xerosis cutis, however, was considered to trigger uremic pruritus and therefore indirectly affects the quality of life in patients.<sup>10</sup>

Severe pruritus without proper management is often associated with depression and mood disturbance. The DOPPS study found that the severity of pruritus was associated with 1.3-1.7 higher incidences of depression.<sup>2,11</sup> Relationship between severe pruritus increased incidence of depression was not assessed in this study.

This study was not without limitation. The small number of subjects involved and the population of one hemodialysis unit could not fully describe Indonesia's population as a whole. This study found a significant positive correlation between the degree of pruritus and xerosis cutis towards patients' quality of life. Thus, clinicians must carefully observe and effectively manage these conditions to prevent the reduction of the quality of life in hemodialysis patients.

## Conclusion

Pruritus occurred in 46% of CKD patients undergoing hemodialysis in Atma Jaya Hospital during August 2019. A strong significant positive correlation was found between the degree of pruritus and xerosis cutis towards the quality of life in patients with CKD ( $r = 0.923$  dan  $r = 0.620$ ;  $p = 0.000$ ), where an increase of pruritus and xerosis cutis severity will negatively impact the patients' quality of life. Proper management of pruritus and xerosis cutis in patients undergoing hemodialysis is necessary to prevent deterioration in the patients' quality of life.

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