https://doi.org/10.59459/1859-1655/JMM.987

CHARACTERISTICS OF CHRONIC PAIN USING THE MCGILL PAIN QUESTIONNAIRE IN MAINTENANCE HEMODIALYSIS PATIENTS AT MILITARY HOSPITAL 103

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ABSTRACT

Objectives: *To assess chronic pain characteristics using the McGill Pain Questionnaire in maintenance hemodialysis patients at Military Hospital 103.*

Subjects and methods: *A cross-sectional study was conducted on 131 maintenance hemodialysis patients at Military Hospital 103 from May 2024 to May 2025. Chronic pain characteristics were assessed using the McGill Pain Questionnaire prior to the hemodialysis session.*

Results: *A total of 83.97% of patients experienced chronic pain. The most common pain locations were the head and facial region (55.0%), extremities (42.7%), and back (39.7%). Most patients reported pain at one or two sites (both accounting for 31.3%). Regarding the sensory dimension of pain, mild pain sensation predominated, with 72.5% of patients having a sensory score ≤ 5. In terms of the affective dimension, the majority of patients reported mild to moderate pain-related emotional responses (96.2%), with affective scores ≤ 6. Based on the total sensory-affective score, pain severity was predominantly mild, as 75.6% of patients had a total score < 10. With respect to pain intensity, most patients experienced mild pain intensity (0-3 points), accounting for 61.1% of cases. Regarding pain perception, chronic pain was mainly distributed within the mild-to-moderate range, with 72.5% of patients reporting a present pain intensity score ≤ 2. There were significant differences in the prevalence of chronic pain according to age, dialysis duration greater than 5 years, and parathyroid hormone (PTH) levels between the pain and non-pain groups ($p < 0.05$).*

Conclusions: *Pain characteristics assessed using the McGill Pain Questionnaire demonstrated that the sensory, affective, and intensity dimensions of pain were generally mild to moderate in severity; however, the pain was persistent and bothersome to patients. Older age, longer dialysis duration, and elevated parathyroid hormone (PTH) levels were significantly associated with the presence of chronic pain.*

Keywords: Chronic kidney disease, chronic pain, McGill Pain Questionnaire.

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Received: 12/01/2026; scientific review: 01/2026; accepted: 28/5/2026

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1. INTRODUCTION

Chronic pain is one of the most common complications in maintenance hemodialysis (MHD) patients [1], [2]. Esmira Sadigova et al [3] reported that 74.4% of MHD patients experienced chronic pain, of whom 61.8% had neuropathic pain. Similarly, Emilie Lambourg et al. (2021) [4] demonstrated that the prevalence of chronic pain was higher in MHD patients (63%) than in kidney transplant recipients (46%).

According to the 2020 definition of the International Association for the Study of Pain (IASP), pain is "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" [5], [6]. Chronic pain is defined as pain persisting for more than three months. This definition emphasizes that pain not only reflects the degree of physical tissue injury but is also substantially influenced by patients' emotional and psychological factors. Consequently, pain assessment is often complex and difficult to standardize.

Among currently available pain assessment tools, the McGill Pain Questionnaire (MPQ) is a highly reliable multidimensional instrument that enables a relatively comprehensive evaluation of both the intensity and qualitative characteristics of pain [7], [8]. Accurate assessment of chronic pain in maintenance hemodialysis patients is of considerable clinical importance, as it facilitates early recognition, timely monitoring of pain progression, and the development of appropriate

intervention strategies to improve patients' quality of life.

Based on these considerations, we conducted this study to evaluate the characteristics of chronic pain using the McGill Pain Questionnaire in MHD patients at Military Hospital 103.

2. SUBJECTS AND METHODS

2.1. Subjects

A total of 131 MHD patients aged ≥ 18 years with stage 5 chronic kidney undergoing HD for at least 3 months at Military Hospital 103 from May 2024 to May 2025 were enrolled in the study.

Exclusion criteria: inability to communicate, sensory disorders (e.g., spinal cord injury, peripheral neuropathy), severe acute comorbidities (e.g., severe infection, heart failure, cirrhosis, malignancy), incomplete data or refusal to participate.

2.2. Methods

- Study design: cross-sectional study.

- Sampling method: convenience sampling of all eligible patients.

- Data collection: clinical and laboratory data were collected, and chronic pain characteristics were assessed once before the hemodialysis session (10-15 minutes per patient)

- Study variables:

+ Patient characteristics: age, sex, BMI, dialysis duration, and hematological and biochemical parameters.

+ Chronic pain characteristics: pain location, number of pain sites, pain duration, and age at pain onset.

+ Chronic pain assessment using the McGill Pain Questionnaire: sensory, affective, and pain intensity dimensions.

+ Associations between chronic pain and selected clinical characteristics of the patients.

- Criteria for assessing pain according to the McGill questionnaire [8]:

+ The sensory pain score: the sum of 11 descriptors assessing the sensory dimension of pain (0-33 points), reflecting the severity and physical characteristics of pain. The affective pain score was the sum of 4 descriptors evaluating emotional responses to pain (0-12 points), representing the psychological impact of pain. The total sensory-affective pain score ranged from 0 to 45 points, providing a comprehensive assessment of the patient's pain experience.

+ Pain intensity (Numeric Rating Scale [NRS], 0-10 points) reflected the patient's self-rated current pain severity. Present Pain Intensity (PPI, 0-5 points) provided an overall assessment of pain severity. Higher scores indicated more severe pain, reflecting not only the sensory dimension but also the emotional burden and tolerability of pain.

- Ethics approval: approved by the Institutional Ethics Committee of Military Hospital 103 (Decision No. 88/HĐĐĐ dated August 19, 2024). All patients participated voluntarily, and the study procedures did not affect patients' health or treatment.

- Statistical analysis: SPSS 25.0. Descriptive statistics were presented as mean ± SD, frequencies, and percentages. Comparisons between two independent groups were performed using Student's t-test for normally distributed variables. Differences in proportions between groups were assessed using the Chi-square test.

3. RESULTS

Table 1. General characteristics

Characteristics (n = 131)		Results
Age (years)	$\bar{X}$ ± SD	58.51 ± 14.89
	Min-Max	21-85
Gender (n, %)	Male	77 (58.78)
	Female	54 (41.22)
BMI (kg/m^2)	$\bar{X}$ ± SD	20.72 ± 2.51
	Min-Max	14.53-29.07
Dialysis vintage (months)	$\bar{X}$ ± SD	50.83 ± 37.07
	Min-Max	6-185
HGB ($\bar{X}$ ± SD) (g/L)		88.59 ± 19.46
Hypoalbuminemia (n, %)		8 (6.1)
Increased PTH (n, %)		87 (66.4)
Increased β^2-Microglobulin (n, %)		131 (100)

Male patients accounted for 58.78% of the cohort. Mean age, BMI, dialysis duration, hemoglobin, and serum albumin were 58.51 ± 14.89 years, 20.72 ± 2.51 kg/m², 50.83 ± 37.07 months, 88.59 ± 19.46 g/L, and 40.77 ± 4.59 g/L, respectively.

- Characteristics of chronic pain (n = 131):

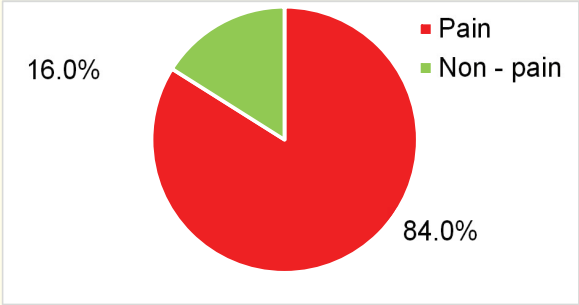

Figure 1. Pain distribution in the study patients.

The rate of patients with chronic pain is quite high, accounting for 84.0%.

Table 2. Characteristics of chronic pain.

Characteristics		Number (n = 131)	Rate (%)
Sites	Head, face	72	55.0
	Neck	23	17.6
	Chest, abdomen	26	19.8
	Back	52	39.7
	Extremities	56	42.7
	Others	2	1.5
Number of pain sites	0	21	16.0
	1	41	31.3
	2	41	31.3
	3	16	12.2
	4	7	5.3
	≥ 5	5	3.8
Duration of chronic pain (months)	< 12	32	24.4
	12-36	39	29.8
	37-60	18	13.7
	61-94	12	9.2
	95-120	7	5.3
	> 120	2	1.5
Age at onset of chronic pain (years)	≤ 30	7	5.3
	31-40	9	6.9
	41-50	21	16.0
	51-60	17	13.0
	61-70	45	34.4
	> 70	11	8.4
	$\overline{X}$ ± SD	56.32 ± 13.82	

Chronic pain occurred at one or multiple sites, most commonly in the head and facial region (55.0%), extremities (42.7%), and back (39.7%). Pain at one or two sites was most frequent (31.3% each), while pain at ≥ 5 sites was uncommon (3.8%). Chronic pain duration was mainly < 5 years (67.9%). Mean age at pain onset was 56.32 ± 13.82 years, most commonly in the 61-70-year group (34.4%).

Table 3. Chronic pain characteristics according to the McGill Pain Questionnaire.

Characteristics		Number (n = 131)	Rate (%)
Sensory pain score (points)	0-5	95	72.5
	6-10	22	16.8
	11-15	14	10.7
	> 15	0	0
Affective pain score (points)	0-3	90	68.7
	4-6	36	27.5
	7-9	5	3.8
	> 9	0	0
Total sensory-affective pain score (points)	0-10	99	75.6
	11-20	28	21.4
	21-30	4	3.1
	≥ 30	0	0
Pain intensity score (points)	0-3	80	61.1
	4-7	46	35.1
	8-10	5	3.8
Overall pain experience score (points)	0	21	16.0
	1	34	26.0
	2	40	30.5
	3	29	22.1
	4	6	4.6
	5	1	0.8

McGill Pain Questionnaire assessment showed that most maintenance hemodialysis patients had mild-to-moderate chronic pain. Sensory pain scores ≤ 5 and affective pain scores ≤ 6 were observed in 72.5% and 96.2% of patients, respectively. Total sensory-affective pain scores were predominantly low, with 75.6% scoring 0-10 points and no cases of severe pain. Mild pain intensity (0-3 points) was most common (61.1%), followed by moderate pain (4-7 points, 35.1%) and severe pain (8-10 points, 3.8%).

Table 4. Associations between chronic pain and selected clinical characteristics

Characteristics		Chronic pain (n, %)		p
		Yes (n = 110)	No (n = 21)	
Sex (n, %)	Male (n = 77)	63 (81.8)	14 (18.2)	0.423
	Female (n = 54)	47 (87.04)	7 (12.96)	
Age (years) (n, %)	≤ 30 (n = 8)	3 (37.5)	5 (62.5)	0.019
	31-70 (n = 97)	86 (86.87)	11 (11.11)	
	> 70 (n = 26)	21 (80.77)	5 (19.23)	
BMI (kg/m^2) (n, %)	< 18.5 (n = 22)	17 (77.27)	5 (22.73)	0.524
	18.5-23 (n = 88)	76 (86.36)	12 (13.64)	
	> 23 (n = 21)	17 (80.95)	4 (19.05)	
Dialysis vintage (years), (n, %)	< 5 years (n = 91)	73 (80.22)	18 (19.78)	0.046
	≥ 5 years (n = 40)	37 (92.5)	3 (7.5)	

The prevalence of chronic pain was 81.8% in male patients and 87.04% in female patients, with no significant difference between sexes (p > 0.05). Chronic pain prevalence increased with age, highest in patients aged 31-70 years (86.87%, p = 0.019). Chronic pain prevalence was comparable across BMI groups (77.27%-86.36%). Patients with dialysis duration > 5 years had a higher prevalence of chronic pain than those with dialysis duration < 5 years (p < 0.05).

Table 5. Associations between chronic pain and selected laboratory parameters.

Subclinical parameters		Chronic pain		p
		Yes (n = 110)	No (n = 21)	
HGB (g/l)	$\bar{X}$ ± SD	89.95 ± 20.05	83.24 ± 14.94	0.17
Urea (mmol/L)	$\bar{X}$ ± SD	24.53 ± 11.16	22.22 ± 8.62	0.379
Creatinine (µmol/L)	$\bar{X}$ ± SD	819.5 ± 381.28	864.03 ± 292.2	0.659
β^2-Microglobulin (mg/L)	Median (IQR)	31.09 (26.02-34.94)	30.01 (24.71-33.49)	0.504
Albumin (g/L)	Median (IQR)	40,07 (37.65-43.31)	40.23 (38.05-43.13)	0.918
Protein(g/L)	Median (IQR)	71.71 (67.15-75.98)	71.55 (68.0-75.04)	0.759
PTH (pg/mL)	Median (IQR)	147.85 (36.25-369.32)	74.8 (42.5-111.00)	0.035

Only PTH levels differed significantly between patients with and without chronic pain (p = 0.035). No significant differences were observed in HGB, urea, creatinine, albumin, protein, or β2-microglobulin levels.

4. DISCUSSION

The patients ranged in age from 21 to 85 years, with a mean age of 58.51 ± 14.89 years. This finding was comparable to studies by Lambourg et al. (2021) [4] and Esmira Sadigova et al. (2020) [3], which reported mean ages of 55 ± 14 and 53.2 ± 12.6 years, respectively. These results reflect the predominance of middle-aged and elderly patients in the hemodialysis population.

Mean BMI was 20.72 ± 2.51 kg/m². Most patients had normal BMI (18.5-23 kg/m², 67.2%). Underweight was observed in 16.8% of patients, while only 6.1% were overweight; no cases of obesity were recorded. These findings are consistent with Levey A.S. et al. (2003) [9], who reported poor nutritional status in HD patients due to dietary restriction, anorexia, chronic inflammation, and metabolic disorders. The results also align with NKF-KDOQI guidelines, in which protein-energy wasting and chronic inflammation are characteristic features of ESKD.

Mean dialysis duration was 50.83 ± 37.07 months, with 57.2% of patients undergoing HD for 1-5 years. This finding was comparable to the study by Esmira Sadigova et al. (2020) [3], which reported a mean dialysis duration of nearly 5 years. Prolonged hemodialysis is a major risk factor for chronic pain due to uremic toxin accumulation, chronic inflammation, peripheral neuropathy, and musculoskeletal complications. Persistent uremia and oxidative stress may also damage small nerve fibers, lowering the pain threshold and contributing to chronic pain persistence.

The prevalence of chronic pain in maintenance hemodialysis patients was approximately 84.0%, indicating that chronic pain is a major clinical problem in HD patients. This rate was higher than that reported by Sadigova et al. (2020) [3], who found a chronic pain prevalence of 74.4% in 225 hemodialysis patients in Azerbaijan, including 61.8% with neuropathic pain. Lambourg et al. (2021) [4] reported chronic pain prevalence rates of 63% in HD patients and 46% in kidney transplant recipients.

The higher prevalence observed in our study may be explained by prolonged dialysis duration (50.83 ± 37.07 months), high rates of metabolic abnormalities (elevated PTH in 66.4% and elevated β2-microglobulin in 100%), high prevalence of anemia (97.7%), and older patient age (mean 58.51 years). These pathophysiological factors have been shown to reduce pain thresholds and contribute to chronic pain mechanisms.

Analysis of pain location showed that the most common sites were the head and facial region (55.0%), extremities (42.7%), and back (39.7%). Sadigova et al. [3] reported the lower extremities (47.1%) and back (40.6%) as the most frequent pain sites. Masajtis-Zagajewska et al. [10] emphasized shoulder and lumbar spine pain associated with carpal tunnel syndrome and calcium crystal arthritis. Despite differences in predominant pain locations, most studies showed pain mainly involving the extremities and axial skeleton, reflecting the effects of hyperphosphatemia, elevated PTH, and chronic inflammation on the musculoskeletal system.

52.6% of patients had pain at ≥ 2 sites, indicating a relatively diffuse pain pattern. Davison et al. (2003) also reported that approximately 40% of patients experienced pain in two or more locations [2]. These findings suggest that pain in HD patients is not purely mechanical or localized inflammatory pain, but may involve systemic inflammation and peripheral neuropathy due to uremic toxin accumulation and mineral-bone disorder. Widespread pain may also reflect central sensitization, which is common in chronic disease states. Mean duration of chronic pain was 36.28 ± 31.2 months (approximately 3 years). Most patients (67.9%) had pain duration < 5 years, while only 6.8% had pain lasting > 7 years. This reflects the natural course of chronic pain in dialysis patients, which typically emerges after 1-2 years of treatment, coinciding with the accumulation of secondary complications. The most common age at pain onset was 61-70 years (34.4%). This period corresponds to increased accumulation of pain-related risk factors, including muscle wasting, hypoproteinemia, osteoporosis, anemia, and depression. Lambourg et al. [4] demonstrated that pain increases with both age and dialysis duration. Therefore, older patients should be prioritized for early screening and timely management of chronic pain.

The majority of MHD patients experienced mild-to-moderate chronic pain, with 72.5% having sensory scores ≤ 5 and 96.2% having affective scores ≤ 6. Total pain scores were predominantly low (75.6% scoring 0-10), and no severe pain was observed. Pain intensity was mainly mild (61.1%), followed by moderate (35.1%) and severe (3.8%), indicating persistent but rarely intense pain. The prevalence of chronic pain was 81.8% in males and 87.0% in females, with no statistically significant difference between sexes ($p = 0.423$). Sadigova et al. (2020) [3] similarly reported no significant gender-related differences in chronic pain perception. Dialysis vintage showed a significant association with chronic pain. Patients on HD for > 5 years had a higher prevalence of pain than those with < 5 years (92.5% vs. 80.22%, $p < 0.05$). This finding is consistent with the pathophysiology of end-stage kidney disease-related pain. Long-term hemodialysis leads to accumulation of uremic toxins, mineral-bone disorder with elevated PTH, and β2-microglobulin deposition causing dialysis-related amyloidosis. Masajtis-Zagajewska et al. [10] also demonstrated that longer dialysis duration increases the risk of chronic pain, particularly musculoskeletal and peripheral neuropathic pain.

5. CONCLUSION

Chronic pain was highly prevalent in MHD patients (84.0%), most commonly affecting the head and facial region (55.0%), extremities (42.7%) and back (39.7%). Pain was predominantly limited to 1-2 sites (62.6%). McGill pain questionnaire results showed mild-to-moderate pain across sensory, affective, and intensity domains. 72.5% had sensory scores ≤ 5. Mild pain intensity (0-3 points) was most frequent (61.1%). Older age and longer dialysis duration were significantly associated with chronic pain, particularly in patients aged 31-70 years (86.87%) and those on dialysis ≥ 5 years (92.5%) ($p < 0.05$).

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