



Alexithymia Levels in Haemodialysis and Non-Dialysis Chronic Kidney Disease Patients: Impact of Sociodemographic Factors

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Abstract Alexithymia, characterised by difficulty identifying and expressing emotions, is increasingly recognised among individuals with chronic kidney disease (CKD). However, comparative evidence between haemodialysis (HD) and non-dialysis (ND) CKD patients, particularly regarding the influence of sociodemographic factors, remains limited. The present study aimed to compare alexithymia levels between HD and ND CKD patients and to examine the role of selected sociodemographic variables, including age, gender, marital status, socioeconomic status, employment status and treatment duration. A quantitative comparative research design was adopted. Alexithymia was assessed using the Perth Alexithymia Questionnaire (PAQ) in two groups comprising 150 HD and 150 ND CKD patients. Sociodemographic and clinical information was systematically collected and statistical analyses were conducted to evaluate group differences and associations between alexithymia and sociodemographic variables. Results indicated that HD patients exhibited higher levels of alexithymia compared to ND CKD patients. Within the HD group, middle-aged, male, married and unemployed patients demonstrated comparatively elevated alexithymia levels. Although the average alexithymia scores were similar across HD and ND groups, a greater proportion of ND patients fell within the lower alexithymia range compared to those undergoing HD. Overall, alexithymia was more prevalent among CKD patients receiving haemodialysis, with sociodemographic and treatment-related factors influencing emotional processing. These findings underscore the importance of routine psychological screening for alexithymia in nephrology settings to facilitate timely psychosocial interventions.

Key Words Alexithymia, Chronic Kidney Disease, Haemodialysis, Sociodemographic Factors

INTRODUCTION

Chronic kidney disease is a progressive and irreversible condition that contributes to physical and psychological burdens across the illness trajectory. Decline in renal function among patients exacerbates feelings of uncertainty about their future, restricted lifestyles and increasing treatment demands, which affect emotional well-being [1,2]. In advanced stages, a life-sustaining yet invasive treatment of Haemodialysis (HD) is required. At the same time, non-dialysis CKD patients opt to manage the disease with routine monitoring and pharmacological medical treatment [3]. Patients experiencing CKD in both the above groups report emotional stress, anxiety, lower quality of life and depression, which highlights the need for addressing challenges related to emotional processing within the CKD population [4].

Alexithymia is a psychosomatic construct characterised by difficulty in identifying and expressing emotions, limited imagination and a tendency toward externally oriented thinking rather than internal emotional awareness [5]. Individuals experiencing alexithymia display a lack of emotional awareness, diminished social relationships and maladaptive coping strategies, which may aggravate both psychological and physical symptoms. In CKD, the long-term health burden, repeated medical procedures and prolonged stress may increase alexithymia traits [6]. CKD patients undergoing HD are exposed to repetitive invasive vascular access, limitations in fluid and diet intake and pain associated with haemodialysis [7]. At the same time, CKD patients in the non-dialysis group, although not exposed to dialysis-related procedures, may still experience uncertainty regarding disease progression, which may lead to emotional

dysregulation. These differences in illness experiences suggest that alexithymia may manifest differently across HD and ND groups.

Sociodemographic factors play a crucial role in shaping emotional functioning, disease perception and treatment adherence in chronic illness. Variables including age, gender, occupation, treatment duration, marital status and socioeconomic status influence treatment access, coping mechanisms and emotional expression, thereby increasing vulnerability to alexithymia [8]. These demographic differences may also be associated with the modality and stage of CKD, affecting emotional processing. Evaluating alexithymia in HD and non-dialysis groups through sociodemographic variables is therefore essential to identify high-risk subgroups and implement appropriate psychological interventions. A clearer understanding of these associations may help improve psychosocial care and support the development of holistic renal health programs for CKD patient.

Aim of the Study

The purpose of this investigation is to assess the level of alexithymia in the HD and ND CKD groups and the effect of sociodemographic factors like gender, marital status, age, occupation, socioeconomic status and treatment duration on the alexithymia in both HD and ND groups. By exploring these differences in demographic variables, we sought to gain insights into alexithymia and its impact on patients' emotional outcomes.

METHODS

The study started after receiving approval from Saveetha Medical College and Hospital's Institutional Human Ethics Committee (Approval No. 019/11/2023/IEC/SMCH, dated 22 November 2023). Further permission was secured from the authorities of the haemodialysis centre and the outpatient ward. The research data were collected at Saveetha Medical Hospital (Saveetha Institute of Technology and Sciences, Chennai, India). The quantitative comparison study included 300 patients with chronic kidney disease: 150 on maintenance dialysis and 150 in the non-dialysis group. For non-dialysis participants, information on CKD stage was retrieved from hospital medical records and determined based on estimated glomerular filtration rate (eGFR) according to KDIGO criteria ("Notice," 2013). Subject participants were selected randomly using a simple randomisation method, according to the inclusion criteria. CKD patients aged 18-60 years with a treatment period of more than 3 months in the HD group and undergoing pharmacological treatment for 3 months or more were recruited for the non-dialysis group. CKD patients with vision loss, cognitive deficits and neurological disorders, psychiatric comorbidities, missed appointments, inability to provide informed consent and who are unable to complete the questionnaires were excluded. Neurological and psychiatric comorbidities or substance use were identified through medical records, with treatment adherence additionally verified through reports from clinical staff.

Patients were initially provided with information about participation and informed consent and their data were kept confidential. Their demographic details, encompassing age, marital status, gender, occupational status, socioeconomic status and treatment duration (haemodialysis or medical management), were obtained. Subsequently, a face-to-face appraisal was held with each patient, briefing them on each question in English or Tamil, depending on their proficiency and authentic responses were recorded. Finally, these responses were entered into an Excel sheet and the total alexithymia scores were calculated using the scoring manual.

The present analysis used the Perth Alexithymia Questionnaire (PAQ) for measuring alexithymia in both groups. It is a 24-item self-evaluation tool in which each item is a statement designed to assess three significant alexithymia components: Difficulty in Finding Emotions (DIF), Difficulty in Describing Feelings (DDF) and Externally Oriented Thinking (EOT). Participants responded to each item on a 7-point Likert scale, with 1 representing "strongly disagree" and seven representing "strongly agree." The Perth Alexithymia Questionnaire does not specify clinical cut-off scores. Therefore, the subjects were categorised into higher, average and lower alexithymia subgroups using sample-based cut-off values derived from the mean \pm 1 standard deviation of PAQ total scores, a method commonly adopted in psychological research for group comparisons. Higher values indicate greater alexithymia.

To achieve maximum reliability, the number of items per component was kept to a minimum. All statements in the DIF and DDF sections addressed both positive and negative emotions. For example, phrases beginning with "When I am feeling good..." and "When I am feeling bad..." were designed to understand how individuals with low consciousness experience pleasant or unpleasant emotions. The EOT aspect precisely gauges a patient's inclination to avoid focusing on emotions. Therefore, statements such as "I prefer to let my emotions happen in the background, rather than focus on them" or "I do not pay attention to my emotions" were included (Chan *et al.*, 2023). An investigation demonstrated, through confirmatory factor analysis, that the PAQ has a theoretically congruent structure and can competently assess its components across all emotions (Preece *et al.*, 2020). Cronbach's alpha coefficient was employed to evaluate internal consistency reliability (Cronbach, 1951). In the current study, PAQ demonstrated excellent reliability, with a Cronbach's α exceeding 0.997 and subscale coefficients of 0.99 for DIF, DDF and EOT.

RESULTS

The association between alexithymia in the haemodialysis and non-dialysis CKD groups and sociodemographic variables, including age, marital status, gender, occupational status, treatment duration and socioeconomic status, was analysed using Chi-square (χ^2) tests. Two-way analysis of variance was used to calculate group differences (ANOVA).

To identify specific differences between groups, minimise type I error and perform post hoc comparisons, the Bonferroni t-test was used. SigmaPlot version 14.5 (Systat Software Inc., San Jose, CA, USA) was employed for statistical analyses. $p < 0.05$ or less was regarded as statistically significant.

Table 1 shows the association between alexithymia and both HD and ND in the CKD groups. The percentage scores of higher, average and lower alexithymia in both HD and ND groups were 20.7%, 10.7%, 68.7%, 5.3%, 10.7% and 84%, respectively. The p-value of 0.001 or less indicates a significant difference between the two groups. Patients on haemodialysis exhibited higher alexithymia than the non-dialysis group. Whereas both HD and ND patients experience similar levels of average alexithymia, the majority of non-dialysis CKD patients had lower alexithymia. As demonstrated in Table 2, there was a significant difference among age, employment status and alexithymia (p -value=0.001). Post hoc t-tests reveal a considerable difference between CKD patients aged 40-60 in both groups. The mean score of 66.8 indicates that a higher proportion of middle-aged patients in the haemodialysis group experienced higher alexithymia. A higher rate of

patients who are unemployed in the HD group experienced greater alexithymia. No significant difference was found in sociodemographic factors or treatment duration between the dialysis and alexithymia groups. According to Table 3, no significant differences among the groups or the demographic variables in the ND group.

Table 4 demonstrates the influence of age on alexithymia in both groups. Post hoc t-tests show a significant difference between middle-aged patients in both groups ($p < 0.001$). The mean score of 66.8 shows that the majority of HD patients aged between 40 and 60 exhibit higher alexithymia than those in the ND group. There is a significant difference between male CKD patients in the HD and ND groups. The mean value of 68.8 shows that male CKD patients in the HD group had higher alexithymia than those in the non-dialysis group. The

Table 1: Association of Alexithymia in HD and Non-Dialysis Groups

Psychological Factor	Categories	Dialysis (HD)	Non-Dialysis (ND)
Alexithymia	High	20.7% (31)	5.3% (8)
	Average	10.7% (16)	10.7% (16)
	Low	68.7% (103)	84% (126)

χ^2 : 15.874, $p < 0.001$, Haemodialysis: 150, Non-Dialysis: 150. The figures in the parentheses are the count of high, average and low alexithymia within haemodialysis (HD) and Non-Dialysis (ND)

Table 2: Association of the Dialysis (HD) group with the distribution of Alexithymia with demographic variables

Demographic Variable	Demographic Category	Higher Alexithymia	Average Alexithymia	Lower Alexithymia	χ^2	p-value
Age	<39 years	9.7% (3)	-	21.6% (22)	20.429	<0.001
	40 - 59 years	74.2% (23)	10% (16)	47% (48)		
	> 60 years	16% (5)	-	32% (33)		
Gender	Male	80.6% (25)	62.5% (10)	71% (73)	1.930	0.981
	Female	19% (6)	37.5% (6)	29% (30)		
Marital Status	Married	90% (28)	87.5% (14)	86% (89)	0.331	0.848
	Unmarried	9.7% (3)	12.5% (2)	13.6% (14)		
Employment Status	Employed	13% (4)	6% (1)	91% (94)	93.694	<0.001
	Unemployed	87% (27)	94% (15)	9% (9)		
Socioeconomic status	Lower	71% (22)	44% (7)	68% (70)	8.314	0.081
	Middle	26% (8)	56% (9)	32% (33)		
	Upper	3% (1)	-	-		
Treatment duration (Years)	<1	26% (8)	25% (4)	14% (14)	3.942	0.414
	1-5	64.5% (20)	56.3% (9)	72% (74)		
	> 5	9.7% (3)	18.6% (3)	14.6% (15)		

Haemodialysis: 150. The numbers in parentheses indicate the counts of patients with higher, average and lower alexithymia in the dialysis group (HD). The χ^2 and 'P' values were obtained using the chi-square test.

Table 3: Association of Non-Dialysis (ND) group on the distribution of alexithymia with demographic variables

Demographic Variable	Demographic Category	Higher Alexithymia	Average Alexithymia	Lower Alexithymia	χ^2	p-value
Age	<39 years	12.5% (1)	31% (5)	25% (32)	3.931	0.415
	40 - 59 years	37.5% (3)	25% (4)	45% (57)		
	> 60 years	50% (4)	44% (7)	29% (37)		
Gender	Male	87.5% (7)	62.5% (10)	50% (63)	4.855	0.088
	Female	12.5% (1)	37.5% (6)	50% (63)		
Marital Status	Married	62.5% (5)	56% (9)	73% (92)	2.197	0.333
	Unmarried	37.5% (3)	44% (7)	27% (34)		
Employment Status	Employed	25% (2)	19% (3)	45% (57)	5.038	0.081
	Unemployed	75% (6)	81% (13)	55% (69)		
Socio-economic status	Lower	87.5% (7)	62.5% (10)	66% (83)	3.251	0.517
	Middle	12.5% (1)	31% (5)	32.5% (41)		
	Upper	-	6.3% (1)	1.6% (2)		
Treatment duration (Years)	<1	50% (4)	25% (4)	44% (55)	2.653	0.617
	1-5	50% (4)	69% (11)	53% (67)		
	> 5	-	6.3% (1)	3.2% (4)		

Non-Dialysis: 150, The numbers in parentheses indicate the counts of patients with higher, average and lower alexithymia in the non-dialysis group (ND). The χ^2 and 'P' values were obtained using the chi-square test.

Table 4: Influence of Age on Alexithymia in HD and ND groups

S. No.	Groups	Age	Alexithymia
1	Dialysis	<40 years	47.6 + 7.8
2	Dialysis	40 - 60 years	66.8 + 4.2
3	Dialysis	≥ 60 years	51.9 + 6.3
4	Non-Dialysis	<40 years	35.4 + 6.3
5	Non-Dialysis	40 - 60 years	37.3 + 4.9
6	Non-Dialysis	≥ 60 years	44.8 + 5.6
7	Comparison of groups (Dialysis/Non-Dialysis)		F = 11.099 p < 0.001
8	Comparison of age (<39/40-60≥ 60)		F = 1.567 p = 0.210
9	Interaction (group X age)		F = 2.531 p = 0.081
10	Comparison within Dialysis (<39/40-60)		t = 2.162 p = 0.094
11	Comparison within Dialysis (<39/≥ 60)		t = 0.424 p = 1.0
12	Comparison within Dialysis (40-60≥ 60)		t = 1.962 p = 0.152
13	Comparison of non-dialysis (<39/40-60)		t = 0.239 p = 1.0
14	Comparison of non-dialysis (<39/>60)		t = 1.105 p = 0.811
15	Comparison of non-dialysis (40-59/>60)		t = 1.000 p = 0.954
16	Comparison between <40 (HD/Non-Dialysis)		t = 1.214 p = 0.226
17	Comparison between 40 - 60 (HD/Non-Dialysis)		t = 4.581 p < 0.001
18	Comparison between ≥60 (HD/Non-Dialysis)		t = 0.838 p = 0.403

The values are mean+standard error (HD: 150, non-dialysis: 150). The 'F', 't' and 'P' values are by two-way ANOVA with Bonferroni 't' test for multiple comparisons

Table 5: Influence of Gender on Alexithymia in Dialysis (HD) and Non-dialysis (ND) groups

S. No.	Groups	Gender	Alexithymia
1	Dialysis	Male	63.3 + 3.8
2	Dialysis	Female	51.0 + 6.1
3	Non-Dialysis	Male	43.3 + 4.4
4	Non-Dialysis	Female	34.4 + 4.7
5	Comparison of groups (HD /Non-Dialysis)		F = 14.438 p < 0.001
6	Comparison of gender (male/female)		F = 4.871 p = 0.028
7	Interaction (group X gender)		F = 0.124 p = 0.725
8	Comparison within Dialysis (male/female)		t = 1.722 p = 0.086
9	Comparison of non-dialysis (male/female)		t = 1.386 p = 0.167
10	Comparison between Male (HD /Non-Dialysis)		t = 3.443 p < 0.001
11	Comparison between Female (HD /Non-Dialysis)		t = 2.161 p = 0.032

The values are mean+standard error (haemodialysis: 150, non-dialysis: 150). 'F', 't' and 'p' values are by two-way ANOVA with Bonferroni 't' test for multiple comparisons

Table 6: Influence of Marital Status on Alexithymia in HD and Non-dialysis (ND) groups

S. No.	Groups	Marital Status	Alexithymia
1	Dialysis	Married	60.3 ± 3.3
2	Dialysis	Unmarried	50.0 ± 15.0
3	Non-Dialysis	Married	39.4 ± 3.5
4	Non-Dialysis	Unmarried	38.0 ± 9.0
5	Comparison of groups (Haemodialysis /Non-Dialysis)		F = 3.348 p = 0.068
6	Comparison of marital status (married/unmarried)		F = 0.433 p = 0.511
7	Interaction (group X marital status)		F = 0.260 p = 0.611
8	Comparison within Dialysis (married/unmarried)		t = 0.683 p = 0.495
9	Comparison of Non-Dialysis (married/unmarried)		t = 0.143 p = 0.887
10	Comparison between Married (HD /Non-Dialysis)		t = 4.364 p < 0.001
11	Comparison between Unmarried (HD /Non-Dialysis)		t = 0.685 p = 0.494

The values are mean+standard error (haemodialysis: 150, non-dialysis: 150). 'F', 't' and 'p' values are by two-way ANOVA with Bonferroni 't' test for multiple comparisons

Table 7: Influence of Employment Status on Alexithymia in Dialysis (HD) and Non-dialysis (ND) groups

S.No	Groups	Employment Status	Alexithymia
1	Dialysis	Employed	48.5 ± 7.2
2	Dialysis	Unemployed	63.6 ± 3.6
3	Non-Dialysis	Employed	35.7 ± 5.0
4	Non-Dialysis	Unemployed	41.6 ± 4.2
5	Comparison of groups (HD /Non-Dialysis)		F = 10.707 p = 0.001
6	Comparison of employment status (employed/unemployed)		F = 3.766 p = 0.053
7	Interaction (group X employment status)		F = 0.637 p = 0.425
8	Comparison within Dialysis (employed/unemployed)		t = 1.764 p = 0.079
9	Comparison of Non-Dialysis (employed/unemployed)		t = 0.906 p = 0.366
10	Comparison between employed (HD /ND)		t = 1.463 p = 0.145
11	Comparison between the unemployed (HD /ND)		t = 3.814 p < 0.001

The values are mean+standard error (haemodialysis: 150, non-dialysis: 150). 'F', 't' and 'p' values are by two-way ANOVA with Bonferroni 't' test for multiple comparisons

influence of married status on the alexithymia in both groups is represented in Table 6. In the married category, the two groups differed significantly from one another. The mean value of 60.3 reveals that a higher proportion of CKD patients in the HD group who are married have higher alexithymia. Table 7 demonstrates the association between occupational status and alexithymia in the HD and ND groups. A significant difference in the unemployed category between the two groups ($p < 0.001$). The mean value of 68.3 represents that a higher proportion of unemployed HD patients have higher levels of alexithymia.

DISCUSSION

The present study examined the differences in alexithymia between haemodialysis (HD) and non-dialysis (ND) groups and the influence of sociodemographic variables. The results reveal that HD patients experience higher alexithymia, suggesting that treatment modality and disease burden significantly influence emotional processing in the CKD population. This finding aligns with theoretical frameworks indicating that repetitive exposure to invasive procedures and prolonged medical distress often lead to emotional suppression and difficulty identifying emotions [9,10]. Higher levels of alexithymia among maintenance dialysis patients may reflect their inability to experience and express emotions both outwardly and internally. This response may arise due to persistent stressors such as frequent cannulation, dependency on treatment and reduced independence.

Initially, suppressing emotions may function as a coping mechanism for patients. However, over time these responses may manifest as an inability to define, identify and express emotions, which are central characteristics of alexithymia [11]. Similar patterns have been observed across chronic illness populations, where higher alexithymia is associated with increased disease burden and emotional vulnerability [12,13]. Age emerged as a significant determinant, with middle-aged haemodialysis patients demonstrating higher alexithymia compared with those in the ND and other age groups [14]. Individuals in midlife often experience peak occupational, familial and financial responsibilities. The interference of chronic illness during this period may result in emotional distress, leading individuals to adopt maladaptive coping strategies such as emotional denial. This finding suggests that middle-aged HD patients may be particularly vulnerable to difficulties in emotional processing.

Gender differences indicated higher alexithymia among male haemodialysis patients compared with those in the non-dialysis group. Previous studies suggest that men tend to restrict emotional expression, especially under chronic health conditions, which may predispose them to alexithymia [15,16]. A significant association was also observed with marital status, as married CKD patients undergoing haemodialysis demonstrated higher alexithymia. Although marital relationships can provide support, chronic illness may alter relationship dynamics, increasing perceptions of caregiver burden and dependency [17-19].

These experiences may encourage patients to conceal rather than express emotions, thereby contributing to alexithymic tendencies.

Employment status was also associated with alexithymia, with unemployed HD patients demonstrating higher scores. Occupation is closely related to psychological well-being, social interaction and emotional competence. CKD patients may lose employment due to functional limitations and treatment burden, which may contribute to diminished self-identity and emotional withdrawal, thereby intensifying alexithymia [20-23].

In the non-dialysis group, no significant associations with demographic variables were observed. This suggests that emotional functioning may not yet be severely impaired in the earlier stages of CKD. These findings indicate that disease progression intensifies psychological burden and emotional inhibition among CKD patients [24]. From a clinical perspective, these findings highlight the importance of psychological screening for alexithymia among HD patients, particularly those who are middle-aged, unemployed, male and married. Alexithymia has been associated with reduced treatment adherence, underreporting of symptoms and poorer quality of life, emphasizing the need for psychosocial interventions within renal care settings [25].

CONCLUSIONS

This study substantiates that the psychological vulnerability in the haemodialysis patients is greater when compared to CKD patients in the non-dialysis group. Alexithymia has emerged as a distinguishing psychological factor in haemodialysis patients with higher scores, specifically in the middle-aged, male, married and unemployed categories. CKD patients in the non-dialysis group showed lower alexithymia levels. The influence of sociodemographic variables was significant in the haemodialysis group, while the ND patients showed consistent psychological profiles. These findings posit that the demands and prolonged burdens associated with chronic kidney disease in the long term may impair emotional awareness and regulation. The results also pinpoint the need for timely and appropriate psychological interventions for haemodialysis patients at a higher sociodemographic risk. Determining the symptoms of alexithymia at the early stage may help improve the emotional functioning of the HD patients, reduce their emotional distress and support their adherence to the treatment regimens. Integrating mental health professionals into haemodialysis care may enhance both psychological and overall well-being of the CKD patients and treatment outcomes.

Ethical Statement

Institutional Review Board Statement

The study commenced after receiving approval from Saveetha Medical College and Hospital's Institutional Human Ethics Committee (Approval No. 019/11/2023/IEC/SMCH, dated 22 November 2023).

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