Section: Miscellaneous

Original Research Article

IMPACT OF A STRUCTURED SUPPORT GROUP PROGRAM ON PERCEIVED STRESS IN HEMODIALYSIS PATIENTS: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Background: Hemodialysis, though essential for patients with end-stage renal disease (ESRD), imposes considerable physical, emotional, and psychosocial burdens. Persistent exposure to stressors such as treatment dependency, lifestyle modifications, and comorbidities contributes to elevated perceived stress levels, which can impair adherence and quality of life. Structured support group programmes may help mitigate these challenges, yet their integration into routine dialysis care remains limited. The objective is to assess the effect of a structured support group programme on: Perceived stress (total, physical, and psychosocial) among patients undergoing hemodialysis. Compare perceived stress levels between the experimental and control groups at two post-test time points.

Materials and Methods: A quasi-experimental pretest-posttest study was conducted with 120 ESRD patients undergoing maintenance hemodialysis, assigned to experimental (n=60) and control (n=60) groups. The experimental group received a structured support group programme comprising cognitive behavioral therapy (CBT), relaxation training, and peer support over six weeks. Perceived stress was assessed using the Hemodialysis Stressor Scale at baseline (Pre), immediately after intervention (Post 1), and at follow-up (Post 2). Data were analyzed using Friedman and Mann-Whitney U tests; significance was set at $p<0.05$.

Results: The experimental group showed a statistically significant reduction in total stress scores from 37.35 (Pre) to 16.97 (Post 2), physical stress from 7.82 to 4.25, and psychosocial stress from 29.53 to 12.72 (Friedman test, $p<0.0001$ for all). The control group showed minimal or non-significant changes. Between-group comparisons at Post 2 confirmed significant differences favoring the experimental group for all stress domains ($p=0.0001$), while Post 1 comparisons were not statistically significant.

Conclusion: The support group programme significantly reduced perceived stress in hemodialysis patients, particularly by the end of the intervention period. These findings advocate for incorporating structured psychosocial support as part of routine hemodialysis care to improve mental well-being and treatment outcomes.

Keywords: Cognitive behavioral therapy, Hemodialysis, Peer support, Perceived stress, Psychosocial intervention, Support group, Total stress.

INTRODUCTION

End-stage renal disease (ESRD) is a chronic and debilitating condition requiring lifelong renal replacement therapy, with hemodialysis being the most common modality. While life-saving, hemodialysis imposes a significant burden on patients, encompassing strict dietary restrictions,

fluid limitations, lifestyle disruptions, financial strain, and dependence on medical technology and caregivers. These cumulative stressors contribute to elevated levels of perceived stress among patients undergoing maintenance hemodialysis, adversely affecting both psychological well-being and treatment adherence.[1,2]

Psychological stress is prevalent in hemodialysis populations, with studies reporting high levels of depression, anxiety, and emotional exhaustion.[3] Such stress is not merely a subjective experience but is associated with poorer clinical outcomes, including increased hospitalizations and mortality.[4] Moreover, it impairs patients' ability to adhere to complex treatment regimens, further worsening health outcomes.[5]

Support group programs have emerged as an effective psychosocial intervention aimed at alleviating these stressors. These programs foster a sense of belonging, provide emotional support, and enhance coping mechanisms by facilitating peer interaction and professional guidance.[6] Structured group interventions incorporating cognitive behavioral therapy (CBT), relaxation techniques, and peer support have shown promise in improving patients' psychological outcomes and perceived quality of life.[7,8] In addition to mental health benefits, social support interventions have been linked to improved physical outcomes, including better biochemical parameters and fewer complications.[9]

Peer support also plays a critical role in improving patient empowerment and self-management, particularly during transitions in care such as dialysis initiation and long-term adherence.[10] Studies suggest that incorporating such psychosocial support into routine care can enhance not only mental well-being but also treatment satisfaction and long-term survival.[11]

Despite these benefits, support group programs remain underutilized in dialysis units due to barriers such as inadequate staffing, lack of structured models, limited awareness, and logistical challenges.[12,13] There is a pressing need for empirical research to validate and promote these interventions in diverse clinical settings.

This study aims to assess the effectiveness of a structured support group program in reducing perceived stress among patients undergoing hemodialysis. By evaluating pre- and post-intervention stress levels, this research seeks to provide evidence supporting the integration of psychosocial care into standard hemodialysis protocols.

MATERIALS AND METHODS

Study Design and Approach: This study employed a quasi-experimental pretest-posttest design with a control group, utilizing a quantitative research approach.

Setting and Population: The study was conducted in the hemodialysis unit of a selected tertiary care hospital in Ernakulam, Kerala, India. Participants included adult patients diagnosed with ESRD, undergoing maintenance hemodialysis for at least six months.

Inclusion Criteria

- Aged 30–65 years
- Undergoing hemodialysis twice weekly via AV fistula or tunneled catheter
- Literate in Malayalam
- Possession of an Android mobile phone

Exclusion Criteria

- Hearing or visual impairments
- Psychiatric or cognitive disorders
- Clinical deterioration during the study
- Missed sessions or relocation during the study period

Sample Size and Sampling Technique: A total of 120 participants were selected using purposive sampling, with 60 patients assigned to the experimental group and 60 to the control group. Sample size was estimated based on a repeated measures ANOVA design, accounting for dropout.

Intervention (Experimental Group): Participants received a six-week structured support group program, including:

- Two individual sessions using Cognitive Behavioral Therapy (CBT) during dialysis
- Two virtual group sessions focusing on cognitive restructuring, emotion mapping, and peer sharing
- Relaxation techniques such as Progressive Muscle Relaxation and mindfulness practice
- Homework assignments and weekly follow-ups

Control Group: Received routine care without additional psychosocial intervention.

Data Collection and Tools:

- Perceived stress was measured using the Hemodialysis Stressor Scale
- Baseline demographic and clinical data were collected via structured interviews and medical records
- Data were collected at three time points: Pre-intervention (Day 1), Post 1 (Day 42), and Post 2 (Day 70)

Statistical Analysis: Normality was assessed using the Shapiro-Wilk test, indicating non-normal distribution. Hence, non-parametric tests (Friedman test, Dunn's post hoc test, and Mann-Whitney U test) were employed to evaluate within- and between-group differences. A p-value < 0.05 was considered statistically significant.

RESULTS

Baseline Characteristics: The mean age was 51.30 ± 7.49 (experimental) and 52.33 ± 4.18 years (control) ($p = 0.933$). Significant differences were observed in monthly income ($p = 0.007$) and family type ($p = 0.017$), while other demographics were

comparable. All participants were nonsmokers, and none had prior exposure to support group programs.

Table 1: Assessment of effect of support group programme on Perceived stress among patients undergoing Hemodialysis (N=120)

Perceived stress score (Total)		Mean	Std. Deviation	Quartile			Friedman Test F value/p value
				25th	Median	75th	
Experimental group (N- 60)	Pre	37.35	10.817	33.25	40.00	43.00	67.127/0.0001*
	Post 1	27.15	11.300	17.25	31.50	37.00	
	Post 2	16.97	9.517	11.00	15.00	22.00	
Control group (N- 60)	Pre	34.10	13.917	24.25	31.50	42.75	5.835/0.054
	Post 1	31.23	16.363	17.75	37.00	38.75	
	Post 2	29.75	8.514	25.00	30.00	34.00	

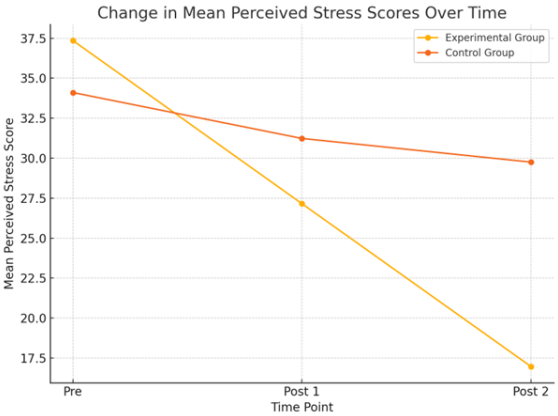

Figure 1: Change in mean perceived stress score over time

Effect of the support group program on perceived stress (Stress score Total) in hemodialysis patients showed a significant reduction in stress levels over time in the experimental group, as seen through the Friedman Test ($F = 67.127$, $p < 0.0001$). Pairwise comparisons (Dunn's post hoc test) indicate that Experimental Group: Significant reductions in perceived stress occurred between Pre and Post 1 ($p = 0.0001$), Pre and Post 2 ($p = 0.0001$), and Post 1 and Post 2 ($p = 0.0001$). In contrast, the Control Group did not show statistically significant changes in perceived stress levels over time, as indicated by the Friedman Test ($F = 5.835$, $p = 0.054$). [Table 1 and Figure 1]

Table 2: Assessment of effect of support group programme on Physical Perceived stress among patients undergoing Hemodialysis (N=120).

Physical Perceived stress		Mean	Std. Deviation	Quartile			Friedman Test F value/p value
				25th	Median	75th	
Experimental group (N- 60)	Pre	7.82	3.301	5.00	8.00	10.00	32.606/0.0001*
	Post 1	6.18	3.223	3.00	8.00	9.00	
	Post 2	4.25	1.936	3.00	4.00	5.00	
Control group (N-60)	Pre	8.13	3.726	6.00	8.00	11.00	8.902/0.012*
	Post 1	6.97	3.598	4.00	7.00	10.00	
	Post 2	6.20	1.571	5.25	6.00	7.00	

The Friedman test for the experimental group revealed a highly significant reduction in stress levels over time ($F = 32.606$, $p < 0.0001$), demonstrating the program's effectiveness. Dunn's pairwise post hoc analysis showed a significant reduction between Pre and Post 1 ($p = 0.012$), highlighting early improvements, which continued into the second post-assessment (Pre vs. Post 2, $p = 0.0001$), confirming sustained effectiveness. Additionally, a significant decrease from Post 1 to Post 2 ($p = 0.028$) suggested ongoing benefits of the intervention. In contrast, the control group also showed a significant difference in stress levels over time ($F = 8.902$, $p = 0.012$), though the changes were less pronounced. Post hoc analysis indicated no significant reduction between Pre and Post 1 ($p = 0.076$), suggesting minimal early change. A statistically significant difference was observed between Pre and Post 2 ($p = 0.021$), but the reduction was not as substantial as in the experimental group, and no significant difference was found between Post 1 and Post 2 ($p = 1.000$), indicating stable stress levels without the intervention. [Table 2]

Table 3: Assessment of effect of support group programme on Psychosocial Perceived stress among patients undergoing Hemodialysis (N=120)

Perceived psychosocial stress level		Mean	Std. Deviation	Quartile			Friedman Test F value/p value
				25th	Median	75th	
Experimental group (N- 60)	Pre	29.53	8.660	27.25	30.00	34.00	81.178/0.0001*
	Post 1	17.83	7.493	11.25	21.00	24.00	
	Post 2	12.72	8.545	7.00	10.50	17.00	
Control group (N-60)	Pre	25.97	11.137	19.00	24.50	32.00	6.306/0.043*
	Post 1	20.47	10.776	14.00	24.00	25.00	
	Post 2	23.55	7.635	19.00	23.50	27.00	

The Friedman test for the experimental group revealed a highly significant reduction in psychosocial stress levels over time ($F = 81.178$, $p < 0.0001$), whereas the control group also showed a significant difference ($F = 6.306$, $p = 0.043$), though the change was less pronounced. In the experimental group, comparisons between Pre and Post 1 ($p = 0.0001$) and Pre and Post 2 ($p = 0.0001$) indicated a strong and sustained reduction in stress levels, further supported by a significant decrease from Post 1 to Post 2 ($p = 0.012$). In contrast, the control group showed no significant change in psychosocial stress levels, with p-values of 0.060 (Pre vs. Post 1), 1.000 (Pre vs. Post 2), and 0.166 (Post 1 vs. Post 2), suggesting stability over time. [Table 3]

Table 4: Comparison between experiment group & control group on perceived stress levels at different time points (N=120)

Variable	Post test 1		Post test 2	
	Statistic	p value	Statistic	p value
Perceived Stressor score (TOTAL)	1471.5	0.083	380.0	0.0001*
Perceived Stress score – Physical	1498.5	0.110	713.5	0.0001*
Perceived Stress score - Psychosocial	1488.5	0.099	392.5	0.0001*

The perceived stress levels between experimental group with control group at two post-test points (Post 1 and Post 2). At Post 1, there was no statistically significant difference between the groups in total perceived stress (p=0.083), physical stress (p=0.110), and psychosocial stress (p=0.099), suggesting that the intervention had not yet produced a significant change. However, by Post 2, the differences became highly significant for total stress (p=0.0001), physical stress (p=0.0001), and psychosocial stress (p=0.0001), indicating a substantial reduction in stress levels in the experiment group compared to the control group. [Table 4]

DISCUSSION

The current study revealed a statistically significant reduction in perceived stress among participants in the experimental group following the support group programme. Notably, improvements were observed across total stress, physical stress, and psychosocial stress components. The Friedman test for total perceived stress yielded an F-value of 67.127 with a p-value < 0.0001, indicating a strong overall effect. Post-hoc pairwise comparisons further confirmed significant reductions at each follow-up point ($p = 0.0001$). Physical stress showed similar improvements ($F = 32.606$, $p < 0.0001$), and psychosocial stress decreased significantly as well ($F = 81.178$, $p < 0.0001$).

In contrast, the control group exhibited no significant changes in stress levels over time ($F = 5.835$, $p = 0.054$), underscoring the intervention's efficacy in addressing stress through structured peer and educational support.

These results are consistent with García-Martínez et al. (2021), who demonstrated that perceived stress in hemodialysis patients is significantly influenced by employment status, resilience, and health-related quality of life (HRQoL). Their regression analysis revealed that resilience alone accounted for a considerable proportion of variance in stress scores, advocating for the inclusion of psychosocial support in dialysis care.[3]

Moattari et al. (2012) further supported the effectiveness of psychosocial interventions, showing that empowerment-based education reduced stress and enhanced self-efficacy in hemodialysis patients (2). Similarly, Ghasemi Bahraseman et al. (2021) reported that stress management training significantly improved coping strategies and overall self-efficacy, leading to better stress control (4). These studies collectively validate the role of structured support interventions in alleviating psychological burden among dialysis patients. [Table 5]

Table 5: Key Comparative Studies on Stress Reduction

Study	Intervention	Sample Size	Stress Outcome	p-Value
Present study	Support Group Programme	60 (exp), 60 (ctrl)	Significant ↓ in total, physical, and psychosocial stress	p<0.0001
García-Martínez et al. (2021).[14]	Resilience & HRQoL-focused analysis	156	Resilience explained 27.1% variance in stress	p<0.001
Moattari et al. (2012).[15]	Empowerment-based program	60	Significant ↓ in stress, ↑ self-efficacy	p<0.05
Ghasemi Bahraseman et al. (2021).[16]	Stress management training	70	Significant improvement in stress coping strategies	p<0.00
Lii et al. (2007).[17]	Group psychosocial therapy	60	Significant ↓ in depression and stress	p<0.01

CONCLUSION

The findings of this study clearly demonstrate that the structured support group programme was highly effective in reducing perceived stress—including total, physical, and psychosocial stress—among patients undergoing hemodialysis.

In the experimental group, stress levels significantly declined across all domains over time, with the most pronounced improvements observed by the second

post-test (Day 70). In contrast, the control group receiving routine care exhibited minimal changes, and no sustained improvement was noted.

Moreover, between-group comparisons confirmed that the experimental group achieved significantly lower stress levels than the control group by the end of the intervention period ($p < 0.0001$ for all stress domains). These findings highlight the need for integrating such structured psychosocial support programs into routine hemodialysis care to improve psychological well-being and enhance patient-centered outcomes.

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