



The Effectiveness of Self-Efficacy Training Based on Kolcaba's Comfort Theory on Anxiety among Chronic Kidney Disease Patients Undergoing Hemodialysis

Sulistiyorini¹, Blacius Dedi^{2*}, Tri Ismu Pujiyanto²

¹Program Master of Nursing Science, Universitas Karya Husada Semarang, Indonesia

²Department of Nursing Science, Universitas Karya Husada Semarang, Indonesia

Corresponding Author*

Dr. Blacius Dedi, S.KM., M.Kep

Department of Nursing Science, Universitas Karya Husada Semarang, Indonesia

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ABSTRACT:

Introduction:

Chronic kidney disease (CKD) patients undergoing hemodialysis are at increased risk of psychological distress, particularly anxiety, due to the chronic and invasive nature of the treatment. Addressing these psychosocial challenges is vital to improving patients' quality of life and adherence to therapy.

Objective:

This study aimed to evaluate the effectiveness of self-efficacy training based on Kolcaba's Comfort Theory in reducing anxiety levels in CKD patients receiving hemodialysis.

Methods:

A quasi-experimental design with a non-equivalent control group was used. A total of 84 participants were selected using total sampling from a dialysis unit in dr. Loekmono Hadi Kudus Hospital in Central Java, Indonesia. Participants were divided into intervention (n=42) and control (n=42) groups. The intervention group received a structured training program based on Comfort Theory. Anxiety levels were assessed using the Hospital Anxiety and Depression Scale (HADS) before and after the intervention. Data were analyzed using paired t-tests and logistic regression.

Results: There was a significant reduction in anxiety scores in the intervention group post-training (pre: 17.29; post: 12.63; $p < 0.001$). Logistic regression revealed that the training was a significant predictor of reduced anxiety (OR = 4.11; 95% CI: 1.23–15.53; $p = 0.001$). Age, gender, and duration of hemodialysis had no significant influence.

Conclusion:

Self-efficacy training grounded in Kolcaba's Comfort Theory significantly reduces anxiety among hemodialysis patients. This psychosocial intervention may be integrated into routine care protocols to improve psychological well-being and clinical outcomes.

1. Introduction

Chronic kidney disease (CKD) is a growing global health burden characterized by progressive and irreversible loss of renal function. Patients with end-stage renal disease often require long-term hemodialysis therapy to sustain life. While hemodialysis improves survival, it also imposes various physical and emotional stressors, contributing to diminished quality of life [1].

Among these stressors, psychological disturbances such as anxiety are prevalent and debilitating. Hemodialysis is

associated with uncertainty, dependence on machines, and strict lifestyle adjustments, all of which provoke emotional instability. Anxiety in CKD patients not only impacts psychological well-being but can also reduce treatment adherence and complicated disease management [2,3].

Addressing anxiety is crucial in the comprehensive care of hemodialysis patients. Previous studies have highlighted the importance of psychological support interventions to mitigate anxiety and promote patient adaptation. One such promising approach is self-efficacy



training, which empowers patients to gain confidence in managing their health conditions and emotional responses [4].

Kolcaba's Comfort Theory provides a holistic framework to enhance comfort across four dimensions: physical, psychospiritual, sociocultural, and environmental. Integrating self-efficacy training within this theoretical model is believed to improve emotional regulation and reduce anxiety by enhancing patients' perceptions of control and support during treatment [5,6].

2. Objectives

This study aims to examine the effectiveness of self-efficacy training based on Kolcaba's Comfort Theory in reducing anxiety among CKD patients undergoing hemodialysis. The findings are expected to contribute to evidence-based nursing practices that promote psychological resilience and holistic care for patients with chronic illnesses.

3. Methods

Study Design and Setting

This quasi-experimental study used a non-equivalent control group design. The research was conducted at RSUD Dr. Loekmonohadi Kudus, Central Java, Indonesia, in May 2025.

Participants

A total of 84 patients diagnosed with CKD and undergoing regular hemodialysis were included. Inclusion criteria were willingness to participate, presence at the time of study, and ability to cooperate. Exclusion criteria included refusal to participate, absence, or patient death during data collection.

Participants were randomly assigned into an intervention group (n=42) and a control group (n=42).

Intervention

The intervention group received a structured self-efficacy training based on Kolcaba's Comfort Theory, consisting of sessions focused on: Physical and psychospiritual comfort, Emotional regulation and anxiety recognition, Building coping strategies, Supportive peer modeling. The control group received standard care.

Instrument

Anxiety levels were measured using the Hospital Anxiety and Depression Scale (HADS), with validated cutoffs: Normal (0–7), Mild (8–10), Moderate (11–15), Severe (16–21)

Data Analysis

Data were analyzed using SPSS v.25. Paired t-tests assessed pre- and post-intervention differences. Logistic regression analyzed the effect of the intervention on anxiety after controlling for demographic variables

4. Results

Participant Characteristics

Table 1 Characteristics Respondents

Characteristics		Frequency	Percentage (%)
Type Sex	Man	52	61.9
	Woman	32	38.1
Age	≤ 30 Years	4	4.8
	31-50 Years	32	38.1
	≥ 51 Years	48	57.1
Education	Elementary School	5	6.0
	Junior High School	18	21.4
	Senior High School	52	61.9
	D3	1	1.2
	D4/Bachelor	8	9.5
Work	ASN	1	1.2
	Mother House Ladder	25	29.8
	Employee	1	1.2
	Students	1	1.2
HD Time	Self-employed	56	66.7
	< 15 months	62	73.8
	16-25 months	18	21.4
> 26 months	4	4.8	

Based on table 1 distribution frequency based on type sex known that part big respondents various sex man as many as 52 respondents (61.9%), some of them big respondents aged ≥ 51 years year as many as 48 respondents (57.1%), some of them big respondents 52



respondents (61.9%) had a high school education, most of them big respondents have work self-employed as many as 56 respondents (66.7%), and part big respondents have been undergoing treatment for a long time hemodialysis ≤ 15 months (73.8%).

Table 2 Frequency Distribution of Respondents Based on Anxiety Level Before Comfort Kolcaba Self-Efficacy Training at Hospital

Level Anxiety	Group				Total	
	Intervention		Control		n	%
	f	%	f	%		
Light	7	16.7	0	0.0	7	8.3
Currently	11	26.2	5	11.9	16	19.0
Heavy	24	57.1	37	88.1	61	72.7
Total	42	100	42	100	84	100

Based on table 2, the frequency distribution based on the level of anxiety before the comfort kolcaba self-efficacy training is known that the majority of the proportion of anxiety levels in both the intervention and control groups is severe anxiety. Each intervention group (57.1%), while the control group (88.1%).

Table 3 Frequency Distribution of Respondents Based on Anxiety Level After Comfort Kolcaba Self-Efficacy Training at Hospital

Level Anxiety	Group				Total	
	Intervention		Control		n	%
	f	%	f	%		
Normal	21	50.0	0	0.0	21	25.0
Light	6	14.3	0	0.0	6	7.1
Currently	12	28.6	16	38.1	28	33.3
Heavy	3	7.1	26	61.9	29	34.5
Total	42	100	42	100	84	100

Based on Table 3, the frequency distribution based on anxiety levels after the Comfort Kolcaba self-efficacy training shows that the proportion of severe anxiety levels in the intervention group (7.1%) was smaller than the control group (61.9%). Meanwhile, the proportion of normal anxiety levels in the intervention group was greater (50%) than the control group (0.0%).

Table 4. Anxiety Analysis Before and After Comfort Kolcaba Self-Efficacy Training at Hospital

Anxiety	Mean	t	df	p-value
Before Training	17.29			
After Training	12.63	11,225	83	0.000

Based on table 4, the analysis of anxiety before and after the Comfort Kolcaba self-efficacy training shows that the p-value is $0.000 < 0.05$, which means there is a difference in the average anxiety before training (17.29) and after training (12.63), so the *Comfort Kolcaba self-efficacy training* is effective in reducing anxiety levels with a difference in the average anxiety score before and after education of 4.66.

Table 5 Multivariate Analysis of Multiple Logistic Regression Test

(The Effect of Kolcaba Comfort Training, Type Gender, Age and Long HD on Anxiety HD Failed Patient Kidney Chronic)

Variables	B	SE	Wald	OR (95% CI)	p-value
Kolcaba Comfort Training	2,1968	5,348	10.229	4.11 (1.23 - 15.53)	0,001*
Sex	0,703	0.693	1.029	2.02 (0.51 - 7.85)	0.310
Age	0.379	0.747	0.258	1.46 (0.33 - 6.31)	0.612
HD Time	0.495	0.734	0.455	1.64 (0.38 - 6.91)	0.500
Constant	19,110	5,349	9,429		

Based on table 5 it is known that that research results prove that there is an influence between training efficacy comfort Kolcaba to anxiety ($p = 0.001$; OR=4.11; 95% CI = 1.23 - 15.53). While the influence type sex to anxiety, although not significant, has the potential to be a risk factor for anxiety also (OR=2.02; 95% CI=0.51-7,85; $p > 0.05$). furthermore influence age to anxiety,



although not significant, has the potential to be a risk factor for anxiety also (OR= 1,46 ; 95% CI= 0.33-6,31 ; $p = >0.05$). So Also influence HD duration against anxiety , although not significant, has the potential to be a risk factor for anxiety also (OR= 1,64 ; 95% CI= 0.38-6,91 ; $p = >0.05$).

5. Discussion

Analysis of Anxiety Before and After Comfort-Based Self-Efficacy Training

Patients with chronic kidney disease undergoing hemodialysis are known to experience high levels of anxiety due to the repeated and lifelong nature of treatment. The pre-intervention scores in this study indicated moderate to severe anxiety levels among participants, which is consistent with previous research reporting similar psychological responses among hemodialysis patients [1]. The recurring exposure to vascular access procedures, dietary restrictions, and lifestyle limitations contribute significantly to emotional distress [2].

After the implementation of self-efficacy training based on Kolcaba's Comfort Theory, a statistically significant reduction in anxiety scores was observed in the intervention group. The approach enables patients to manage their emotional reactions through structured training in self-regulation, coping skills, and internal motivation. This aligns with findings by Safi et al., which highlighted the importance of enhancing self-efficacy as a pathway to reducing anxiety in patients with chronic conditions [3].

Moreover, the use of Kolcaba's Comfort Theory, which encompasses physical, psychospiritual, sociocultural, and environmental dimensions, contributed to a holistic improvement in patient well-being. Similar comfort-based interventions in nursing practice have been shown to improve patient outcomes by promoting a greater sense of control and emotional stability [4,5].

Factors Influencing Anxiety in Hemodialysis Patients

This study also explored demographic and clinical characteristics such as gender, age, education level, and duration of hemodialysis therapy as potential predictors of anxiety. The logistic regression analysis revealed that these variables did not have a statistically significant effect on anxiety outcomes. This suggests that anxiety in hemodialysis patients is influenced more by psychosocial than demographic factors, a conclusion supported by Damanik's findings on anxiety patterns in similar populations [6].

Importantly, the only factor that significantly influenced anxiety reduction was the provision of the Comfort-based self-efficacy intervention. Patients who received this training were more than four times as likely to exhibit declining anxiety levels. This highlights the relevance of structured psychosocial support in chronic disease management, in accordance with Bandura's theory on self-efficacy and behavior change [7].

The non-significance of demographic factors suggests that such interventions can be universally applied across various patient groups. Prior studies confirm that regardless of age or sex, psychosocial interventions when designed with a holistic framework can improve coping mechanisms and reduce anxiety [8].

6. Conclusion

Analysis of Anxiety Before and After Kolcaba Comfort Self-Efficacy Training. Statistically, there was a significant difference between anxiety levels before and after training in the intervention group (p -value = 0.000). The decrease in mean anxiety scores indicates that the training was able to holistically address comfort needs in accordance with the Kolcaba Comfort principles. The positive psychological effects of the training demonstrate that empowering self-efficacy can effectively address patients' emotional distress.

Effect of Training, Gender, Age, and Duration of Hemodialysis on Anxiety in Hemodialysis Patients with Chronic Kidney Failure. Statistical tests showed that only the Kolcaba Comfort-based self-efficacy training had a significant effect on patient anxiety. Gender, age, and duration of hemodialysis did not show a significant relationship with anxiety levels. This indicates that the training is effective for broad application regardless of patient demographic characteristics, making it an inclusive and adaptive nursing intervention.

For Further Research: Future researchers are also encouraged to incorporate qualitative approaches, such as in-depth interviews or focus group discussions (FGDs), to delve deeper into patients' subjective experiences related to self-efficacy training and comfort during hemodialysis. This approach will provide a more comprehensive understanding of patients' emotional and psychosocial needs. In addition, the development of technology-based intervention models, such as self-efficacy training through digital media (educational applications or telecounseling), is also worth researching to address the challenges of limited time, energy, and mobility for patients undergoing routine hemodialysis therapy, as well as to support digital transformation in modern nursing services.



Ethical Considerations

This study was approved by the Ethical Review Committee of RSUD dr . Loekmonohadi Kudus, Central Java, Indonesia (No: 06/KEPK/RSLH/II/2025). Written informed consent was obtained from all participants.

Conflicts of Interest

The author declares no conflict of interest.

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References

1. Yosep I, Hikmat R, Mardhiyah A. Anxiety levels among hemodialysis patients: A cross-sectional study. *J Nurs Pract.* 2023 ;6 (2):102–108.
2. Baransano IF, Tambunan E. Levels of depression, anxiety, and stress in chronic kidney failure patients undergoing hemodialysis. *Nurs Update.* 2023 ;14 (2):89–96.
3. Kolcaba K. *Comfort theory and practice: A vision for holistic health care and research.* New York: Springer Publishing Company; 2003.
4. Bandura A. *Self-efficacy: The exercise of control.* New York: WH Freeman; 1997.
5. Damanik H. Anxiety level of chronic kidney failure patients undergoing hemodialysis. *Imelda Scientific Journal of Nursing.* 2020 ;6 (1):80–85.
6. Safi F, Areshtanab HN, Ghafourifard M, Ebrahimi H. The association between self-efficacy, perceived social support, and family resilience in patients undergoing hemodialysis: a cross-sectional study. *BMC Nephrol.* 2024 ;25:207 .
7. Rahmatika D, Hasanah U. The effect of psychoeducation on anxiety in chronic kidney disease patients undergoing hemodialysis. *Indonesia J Ment Health Nurs.* 2024 ;7 (1):45–52.
8. Tabiee S, Momeni A. The effects of comfort-based interventions on the level of comfort among hemodialysis patients. *Mod Care J.* 2017 ;14 (3):e64687.