Original Article

Association Between Hemoglobin Levels, Duration of Hemodialysis, and Mental Health Outcomes in CKD Patients: A Cross-Sectional Study

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ABSTRACT

Background: Chronic kidney disease (CKD) is a global health problem that can progress to end-stage renal failure requiring hemodialysis. Patients on long-term hemodialysis often experience anemia and mental health problems, yet evidence from Indonesia and other LMICs on the relationship between clinical factors and mental health remains limited. This study aims to analyze the association between hemodialysis duration and hemoglobin levels with mental health and emotional role functioning in hemodialysis patients.

Methods: This quantitative study used a cross-sectional design. A consecutive sampling method was used, involving 75 patients undergoing hemodialysis from hospitals across Bangka Island between June and August 2024. Inclusion criteria are undergoing hemodialysis twice a week, and exclusion criteria are experiencing sudden shortness of breath and being in unstable or emergency conditions during data collection. Independent variables are years on hemodialysis and hemoglobin; dependent variables are the Mental Health and Role Emotional domains of the SF-36. The SF-36 questionnaire is a valid instrument used in patients undergoing hemodialysis to study physical activity and rehabilitation. Data analysis included univariate analysis to determine the mean and standard deviation, as well as bivariate analysis using the Pearson correlation test using SPSS Version 26.

Results: The mean score for the Mental Health (MH) domain was 59.22, and for the Role Emotional (RE) domain, it was 30.67, indicating that patients undergoing hemodialysis had relatively low scores in both domains. A significant correlation was found between years on hemodialysis and hemoglobin levels with mental health and role emotional scores (P =0,0001) (P value < 0,05).

Conclusion: Mental health and role emotional issues in patients with CKD undergoing hemodialysis are still understudied, which negatively affects their quality of life. Healthcare professionals need to conduct comprehensive assessments that consider not only the physical but also the mental health and emotional role aspects of these patients. Many patients undergoing hemodialysis have poor mental health and emotional functioning. Factors such as years on hemodialysis and hemoglobin levels are associated with improvements in these domains.

Keywords: Chronic Kidney Disease; Mental Health; Quality of Life; Anemia .

Implications for Practice:

- Routine integration of psychological screening into hemodialysis care improves patient-centered quality and holistic outcomes.
- Updating nephrology nursing protocols to include a structured mental health assessment ensures evidence-based, culturally responsive care.
- Targeted anemia management and long-term adaptation support strategies can prioritize efficient and safe interventions in resource-limited settings.

Introduction

Chronic Kidney Disease (CKD) is a progressive and irreversible condition that leads to a decline in kidney function, preventing the body from maintaining normal metabolism and fluid-electrolyte balance, ultimately resulting in uremia (Smeltzer, S.C., Bare, B.G., Hinkle, J.L., Cheever, 2010). CKD begins with early disturbances in fluid balance, salt handling, and waste product accumulation, progressing to a decrease in kidney function to less than 25%. As it happens, nephron damage occurs, and kidney function progressively decreases with manifestations of accumulation of metabolites that should be removed from circulation, so that severe uremia syndrome will occur, giving many manifestations in the body organs. Continuous inflammation can cause damage to the nephron structure. Inflammation contributes to cardiovascular and all-cause mortality in CKD and has a distinct function in its pathophysiology. Chronic and recurring infections, altered adipose tissue metabolism, intestinal dysbiosis, increased synthesis and impaired clearance of pro-inflammatory cytokines, oxidative stress, and acidosis are among the factors that lead to a chronic inflammatory state in CKD (Boima et al., 2025).

The incidence of CKD has been consistently increasing over time. According to the World Health Organization (WHO) in 2019, CKD affects approximately 10% of the global population, with an estimated 1.5 million people worldwide undergoing hemodialysis (HD). Globally, 5 to 10 million deaths annually are attributed to CKD, and approximately 1.7 million deaths occur each year due to acute kidney injury (damage) (Zulfan Efendi, 2021). In Indonesia, national data indicate that there are approximately 713,783 patients with CKD, and 2,850 are undergoing hemodialysis. The prevalence of CKD according to the 2023 Indonesian Health Survey (SKI) was approximately 0.22% in men and 0.14% in women, with prevalence increasing with age. The most common comorbidities in CKD are hypertension and diabetes (Nasution et al., 2026).

The highest number of patients with CKD is in West Java, with 131,846 cases, followed by Central Java with 113,045 cases, and North Sumatra with 45,792 cases. Of the total cases, 355,726 are male, and 358,057 are female *Profil-Kesehatan-Indonesia-2019*, n.d.). According to the 2018 Basic Health Research data from Bangka Belitung, the prevalence of CKD in Bangka Belitung Province was 0.29% - or 8,971 people out of a population of 1,375,053 (*Riskesdas Kepulauan Bangka Belitung 2018*, n.d.) This study used data from 122,449 CKD patients undergoing hemodialysis during 2016–2019, based on the Indonesian Renal Registry(Andhika et al., 2025).

In patients with end-stage chronic kidney disease (ESKD), renal replacement therapy is essential to maintain body function. Hemodialysis is one of the most commonly used therapies. This procedure partially replaces the kidneys' function in removing metabolic waste products, maintaining fluid balance, and maintaining electrolyte balance in the body. Hemodialysis is the primary form of renal replacement therapy widely used in

patients with end-stage kidney disease (ESKD), when kidney function is no longer able to maintain body homeostasis adequately (Xue et al., 2019). However, hemodialysis can also cause complications in the body that affect the patient's physical health, which, in turn, can negatively affect their mental health (well-being). Mental health problems are very serious in patients undergoing hemodialysis. A cross-sectional study of ESRD patients found that patients experienced depression and anxiety disorders (Alshelleh et al., 2023). Depression and anxiety in hemodialysis patients are significantly correlated with decreased physical, psychological, social, and environmental health (Mohamed et al., 2023).

Mental health is a critical component of overall health, yet it remains underprioritized in many developing countries. Insufficient supporting data have not enabled the formulation of mental health policies, as is the case in developing countries. In fact, high-quality data is needed to formulate effective policies so that mental health management efforts at primary and secondary health service levels can be more effective. According to the Ministry of Health of the Republic of Indonesia (2019), the national prevalence of depression among individuals aged 15 years and older is 6.1%, with only 9% of those affected receiving treatment from professionals. The rising incidence of mental health issues underscores the need for greater attention to mental health care in Indonesia.

Patients undergoing hemodialysis experience increased stress levels. This is due to the routine hemodialysis treatment and therapy schedule that requires regular and time-consuming sessions, dietary restrictions, fluid intake limitations, and the various physical changes they endure, often lead to significant emotional strain. These physical challenges inevitably affect the patient's mental condition(Mardiyah & Johan, n.d.; Wen et al., 2023). However, only few studies have specifically discussed the mental health conditions of patients undergoing hemodialysis in Indonesia. With the increasing number of patients with CKD undergoing hemodialysis in Bangka and the lack of studies on their mental health, this study aims to address this gap. The novelty of this study lies in its focus not only on mental health but also on the role of emotions of patients undergoing hemodialysis. In addition, researchers analyze patient-specific factors related to the mental health and emotional role of patients undergoing hemodialysis. Patient-specific factors, such as low hemoglobin levels, will limit patient activities. This study is among the first in Indonesia to simultaneously examine clinical biomarkers (hemoglobin) and psychological domains (Mental Health and Role Emotional)." Several studies have shown that patients with anemia experience various problems across multiple dimensions of health Alshogran et al., 2021) In addition, years on hemodialysis are also a factor. Patients undergoing hemodialysis for a long time are more susceptible to experiencing mental health disorders (Goyal et al., 2018)

Health conditions are not solely the result of biological factors; rather, they are the complex interaction of biological, psychological, and social factors. In patients with chronic kidney disease (CKD) undergoing hemodialysis, biological factors such as hemoglobin levels and hemodialysis duration not only reflect the physiological burden of the disease but also influence patients' functional status and mental health. Anemia is a common complication in CKD patients undergoing hemodialysis and is associated with reduced health-related quality of life; recent consensus studies confirm that chronic anemia negatively impacts physical activity capacity and other

aspects of quality of life, necessitating a more holistic management approach to improve patient QoL (Dasgupta et al., 2024).

A study of the quality of life of CKD patients in Low- and Middle-Income Countries (LMICs) found that advanced-stage patients, including those on dialysis, had consistently lower health-related quality of life (HRQoL) scores than those in developed countries (Muxunov et al., 2026). Anemia is a common complication and is associated with decreased QoL scores in both physical and mental dimensions, reflecting a significant psychological burden in patients with low hemoglobin levels.

The results of the psychological assessment are supported by data from patient interviews. Patients reported experiencing various psychological issues, including fear, anxiety, tension, worry throughout the day, sadness, and pessimism. However, for those who have undergone treatment for approximately 6 (six) months, there has been a noticeable improvement in their psychological condition. These patients have shown an ability to adapt to and accept their illness. Despite this, patients often view their condition as distressing, leading to negative thoughts, particularly a persistent fear of death. Many patients also report feeling fatigued (tired) with the ongoing therapy, which triggers stress and ultimately affect their psychological condition. Mental health conditions in patients undergoing hemodialysis are frequently overlooked. While there is an abundance of research focusing on the physical health of patients with CKD, studies exploring their psychological condition are limited. CKD is a complex disease, and nephrology nurses play an important role in the ongoing improvement of health of patients undergoing hemodialysis. Comprehensive assessments are essential to provide appropriate psychological interventions and support. Seeing this phenomenon, researchers are interested in conducting this study to determine the levels of mental health and emotional roles among patients undergoing hemodialysis on Bangka Island.

Methods

Study Design

This quantitative study used a correlational analytical method. Specifically, a cross-sectional design is used to determine the relationships between independent and dependent variables within a single time unit. The research aims to analyze the relationship between patient-specific factors (years on hemodialysis and hemoglobin levels) and patients' mental health and emotional role in the hemodialysis room.

Participants

The study was conducted from June to August 2024 at multiple hospitals across Bangka Island, including RSU Provinsi Ir. Soekarno, RS Bakti Timah Pangkalpinang, RSU Daerah Depati Bahrin Sungailiat and RS Depati Hamzah Pangkalpinang. The sample included patients currently receiving hemodialysis at the aforementioned hospitals. A consecutive sampling technique was applied, resulting in a sample size of 75 patients and no dropouts. Sampling was conducted by selecting respondents to participate in the research according to the researcher's established criteria. Participants met the following inclusion criteria: (1) Undergoing hemodialysis twice a week and (2) Willing to participate as respondents. Meanwhile, patients excluded were those who met the exclusion criteria: (1) experiencing sudden shortness of breath and (2) being in unstable or emergency conditions during data collection.

Instruments

The instrument used in this study was the SF-36 questionnaire. The SF-36

questionnaire is a valid instrument used in patients undergoing hemodialysis to study physical activity and rehabilitation. The SF-36 questionnaire can also describe aspects of general mental health, limitations in daily activities due to emotional problems, vitality, and overall perceptions of health. The researchers conducted a transadaptation process for the cross-cultural measurement instrument, consisting of an initial translation from English to Indonesian and back-translation by a licensed translator. Afterward, the researchers conducted validity and reliability tests on the instrument. The validity test for the SF-36 questionnaire showed values ranging from 0.532 to 0.856. Since the corrected item-total correlation (r) exceeded the r-table value of 0.3961, the questionnaire was deemed valid. The reliability test yielded a Cronbach's Alpha value of 0.954, indicating that the instrument is highly reliable.

Data Collection

Data collection was conducted from June to August 2024 by a trained research team in Pangkalpinang, using a questionnaire administered directly to respondents, accompanied by a data collector, to ensure clarity and completeness. Quality control procedures included daily questionnaire review by the field coordinator to avoid incomplete or ambiguous data.

Data Analysis

Data were entered and analyzed using SPSS version 25. This study used both univariate and bivariate analyses. The univariate analysis was used to describe patient-specific factors, including years on hemodialysis (duration of hemodialysis), hemoglobin levels, and the mental health and role emotional status of patients under study. The results were presented as means and standard deviations. Before conducting the biparietal analysis, the researcher conducted a normality test using the Kolmogorov-Smirnov test for large samples (n>50). The results of the normality test for all variables were greater than α (0.05). This indicates that the data is normally distributed. Furthermore, the bivariate analysis was used to assess the relationship between patient-specific factors (years on hemodialysis and Hb levels) and their mental health and emotional roles, using the Pearson correlation test. The significance level is at α = 0.05 with a 95% confidence interval.

Ethical Considerations

This study received ethical approval from the UNISA Research Ethics Committee (Ethical Approval No. 3707/KEP-UNISA/VI/2024). Permission was obtained from the hospital Director before data collection. All participants provided fully informed consent, and confidentiality and privacy were maintained throughout the study. Participants were informed of their right to withdraw at any time without consequence, ensuring voluntary participation.

Results

The characteristics of patients undergoing hemodialysis, specifically their years on hemodialysis (hemodialysis duration) and hemoglobin (Hb) levels, are summarized in Table 1.

Table 1. Respondent Characteristics Based on Length of Experience and Hb Value

Respondent characteristics	Mean	SD	Median	Min-Max	95% CI
Years on hemodialysis	4.51	1.83	5	1-8	2.3-3.24
Hb Levels	8.45	1.45	9	6-12	9.08-9.61

Based on the data in **Table 1,** the mean for years on hemodialysis among the 75 respondents was 4.5 years, with a standard deviation of 1.83. The mean hemoglobin level was 8.45 mg/dL.

Table 2. Normality test

Variables	Mean	SD	p value
Role Emotional	30.67	37.47	0.200
Mental Health	59.22	20.20	0.092
Years on HD	4.51	1.85	0.070
HB levels	8.45	1.41	0.060

Based on the data in **Table 3,** the researcher conducted a normality test using the Kolmogorov-Smirnov test for large samples (n>50). The results of the normality test for p-value showed that all variables were greater than α (0.05). This indicates that the data is normally distributed.

Table 3. The Relationship between Characteristics of Respondents and Mental Health

Variables	Mental Health	
	R	*P value*
Years on hemodialysis	-0.63	<0.001
Hb Levels	0.605	<0.001

Based on the data in **Table 3,** there is a significant relationship between years on hemodialysis and patients' mental health ($p < 0.001$). The correlation coefficient of -0.63 indicates a strong negative correlation, meaning that as the number of years undergoing hemodialysis increases, the patient's mental health worsens. This suggests that patients who have been undergoing hemodialysis for a longer period tend to experience better mental health. In addition, there is a significant relationship between hemoglobin (Hb) levels and patients' mental health ($p < 0.001$). The correlation coefficient of 0.605 indicates a strong positive correlation, meaning that the higher Hemoglobin levels, the better mental health in patients undergoing hemodialysis.

Table 4. The Relationship between Characteristics of Respondents and Emotional Roles

Variables	Emotional Roles	
	R	*P value*
Years on hemodialysis	0.612	<0.001
Hb Levels	0.638	<0.001

Based on the data in **Table 4,** there is a significant relationship between years on hemodialysis (duration of undergoing hemodialysis) and patients' emotional roles ($p < 0.001$). The correlation coefficient of -0.612 indicates a strong negative correlation, meaning that as years on hemodialysis increase, patients' emotional roles become more positive. In addition, there is a significant relationship between Hb levels and patients' emotional roles ($p < 0.001$). The correlation coefficient of 0.638 indicates a strong positive correlation, meaning that higher Hb levels are associated with a better role in patients undergoing hemodialysis.

Discussion

The significant negative relationship between hemodialysis duration and functional status can be understood through the Biopsychosocial Model, which emphasizes that the course of a chronic disease such as CKD affects not only biological aspects but also psychological and social aspects of the patient. Long-term hemodialysis is a form of chronic stress that impacts physical capacity through the accumulation of biological factors such as anemia. Anemia is one of the most common chronic kidney diseases (CKD) complications. It negatively affects patients' quality of life and clinical outcome (Badura et al., 2024; Dasgupta et al., 2024). This then leads to severe fatigue and limitations in daily activities. This model is consistent

with international literature findings showing that hemodialysis duration is negatively correlated with various domains of quality of life, including functional ability and social engagement. Years of dialysis are a factor related to the physical and mental components. This suggests that the experience of long-term therapy can influence a patient's psychological adaptation process. The experience of hemodialysis patients shows that although long-term dialysis therapy has a heavy bio-psychosocial impact, patients gradually develop coping strategies such as spiritual coping, problem-focused coping, and the search for meaning in life to adjust to chronic illness.

In the context of Low- and Middle-Income Countries (LMICs), empirical evidence from multinational studies indicates that CKD patients significantly impact the physical and mental quality of life, especially in advanced stages of the disease and amongatients undergoing dialysis (Muxunov et al., 2026). Limited access to optimal anemia therapy and physical rehabilitation services increases the risk of functional status decline and mood disorders in LMIC populations. In developing countries, limitations in managing CKD anemia are not only prevalent but also impact on the quality of life of patients undergoing dialysis (Khan et al., 2024). This study emphasizes that socioeconomic status is a strong determinant of health outcomes, particularly mental health domains. In developing countries like Indonesia, economic, geographic, and health infrastructure factors exacerbate the impact of chronic diseases. Limited access to scattered hemodialysis facilities, the burden of transportation costs, and other indirect costs exacerbate psychosocial stress for patients and their families, especially among productive groups. Hemodialysis patients in LMICs have lower scores in the role emotional and mental health domains than patients in high-income countries. (Machaca-Choque et al., 2024)Cultural factors also influence the experiences of CKD patients on hemodialysis. In collectivist cultures like Indonesia, family support is often strong and can act as a buffer against psychological distress. However, family dynamics can also create emotional stress—patients who are no longer able to play the role of breadwinner or active family member may experience feelings of loss of self-worth, exacerbating the emotional domain.

Chronic diseases, such as those in patients with chronic kidney disease, require continuous care and ongoing therapy to maintain their health levels. The need for routine and long-term care often leads patients to experience feelings of helplessness, which can adversely affect their mental and emotional conditions. Previous studies have shown that patients with CKD often experience a decline in mental health, which significantly affects their overall quality of life(Ma et al., 2021a; Wilk et al., 2022). In this study, the assessment of mental health focused on evaluating general mental health, including symptoms of depression, anxiety, and emotional control habits. Low mental health scores indicate continuous feelings of tension and depression, while high scores indicate feelings of peace, happiness, and calmness. The mental health assessment in this study explored various conditions, such as experiencing happy moments, tension, depression, peace, hopelessness, and sadness. In addition, this study also assessed emotional roles, which measure the degree to which emotional issues (problems) interfere with work or daily activities.

Low emotional role scores indicate that emotional issues interfere with daily activities, leading to reduced activity levels, decreased productivity, and, in some cases,

an inability to function normally. Patients undergoing hemodialysis often experience fatigue, which is related to both physical and functional limitations. In patients with CKD, a decline in physical health is common (Legrand et al., 2020). This condition affects the ability to perform daily tasks because the functional capacity is reduced. Other studies also indicate that patients with CKD frequently experience emotional changes (Kim et al., 2022).

The results of this study indicate that the mental health and emotional roles of patients undergoing hemodialysis on Bangka Island are low. Patients undergoing hemodialysis will experience emotional changes, where they feel less capable of completing tasks compared to their usual capacity. CKD patients often experience emotional impacts such as anxiety and depression. In CKD patients undergoing dialysis, these disorders impact daily life, with approximately 80% of patients reporting that their condition affects their ability to work (Pollock et al., 2024). Several studies have also confirmed that the relationship between physical and mental health is significant in patients undergoing hemodialysis. The quality of life of patients with CKD will be disrupted if there are problems with physical and mental health (Pretto et al., 2020). The complex experience of physical changes and emotional turmoil in patients undergoing hemodialysis is shaped by various factors, including physical, physiological, psychological, social, spiritual, and cultural influences (Rosyanti et al., 2018). These factors can significantly affect the mental and emotional states of patients undergoing hemodialysis. Moreover, psychological disorders in these patients can affect their acceptance of the disease and its treatment, as well as their interpersonal relationships with family and their broader social life.

Low mental health scores are associated with depression in patients undergoing hemodialysis. Hemodialysis, which is a lifelong therapy for patients with CKD, can act as a chronic stressor. Previous studies have also noted that negative emotions such as anxiety, depression, stress, and psychological pressure emerge as a consequence of these chronic stressors (Guerra et al., 2021). These emotional impacts may arise when patients feel bored or sad, having to abandon many of the personal interests, hobbies, or activities they once enjoyed. The progressive nature of kidney disease, combined with the uncertainty about life expectancy, can exacerbate these feelings of depression so that the patient's mental health condition becomes poor (low).

In this study, patient-specific factors examined included hemoglobin levels and years on hemodialysis (duration of undergoing hemodialysis). The results indicate a significant relationship between both hemoglobin levels and years on hemodialysis with patients' mental health and emotional role. Patients with chronic kidney disease (CKD) and anemia have limitations in productivity. Anemia is a common complication experienced by patients with CKD. In patients with CKD, kidney anemia can also cause the development of cardiovascular complications (Ahsan et al., 2021). Normal hemoglobin levels in adults are typically around 11 g/dL for males and 12 g/dL for females. Hemoglobin homeostasis is maintained by the hormone erythropoietin (EPO), which stimulates red blood cell production in the bone marrow. In patients undergoing hemodialysis, anemia frequently occurs due to kidney failure, leading to reduced EPO production (Kalantar-Zadeh et al., 2021). This decline in EPO levels leads to reduced red blood cell production, resulting in anemia. Anemia in patients with CKD is not only a physical complication but also closely linked to psychological distress, as these patients are

at a higher risk of developing depression. This is due to Erythropoietin (EPO)—often used to treat anemia in patients with end-stage kidney disease (ESKD)- which has been shown to have neuroprotective and antidepressant properties (Lin et al., 2021). So, in patients whose hemoglobin levels decrease, they will experience limitations in activity so that their emotional roles and mental health conditions will be disturbed.

Undergoing hemodialysis for more than two years significantly affects patients' mental health (Ma et al., 2021b). Several factors, such as strong family support, education level, and marital status, support the patient's ability to undergo long-term hemodialysis. These factors also affect the patient's stress and depression levels (Ganu et al., 2018). Patients who have undergone hemodialysis for more than 5 years have a lower quality of life, and those with a relatively long duration of hemodialysis have poorer interpersonal relationships because they interact less with their surroundings. Previous studies have shown that long-term hemodialysis triggers depression that is significantly associated with poor quality of life. Depression may arise from multiple factors, such as job loss, reduced income, and drastic lifestyle changes, as patients spend approximately three hours per session, 2-3 times per week, undergoing hemodialysis (Ganu et al., 2018). Previous research also shows that patients with chronic kidney disease experience a gradual decline in health due to reduced physical, social, and psychological abilities. This decline in quality of life is further exacerbated by increasing levels of anxiety and stress over time (Mohamed et al., 2023). Years on hemodialysis (duration of time spent on hemodialysis) have been identified as a mediator in the relationship between emotional regulation and self-acceptance of chronic illness (Y. H. Kim et al., 2024; Ye et al., 2022).

This study has several strengths, including the use of the SF-36 questionnaire, a specific and reliable instrument for measuring quality of life in patients with CKD undergoing hemodialysis. In addition, data collection was conducted through direct face-to-face interviews to obtain more complete data, although bias may have occurred in the interview results. Furthermore, the study's inclusion of several hospitals across Bangka Island increases the generalizability of the findings. Previous studies on mental health in patients with CKD have often failed to compare mental health with role emotional or link these factors to patient-specific factors. However, the study also has limitations. One major limitation is the uneven distribution of the patient population across hospitals. There are several hospitals with large populations, but there are also hospitals with only a small population. The implications of this study offer benefits, especially for nephrology nurses, by enabling in-depth assessments that go beyond physical health and emphasizing comprehensive interventions to meet both physical and emotional needs of patients undergoing hemodialysis.

Implications and limitations

This study highlights the complications of hemodialysis. The duration of hemodialysis and hemoglobin levels are related to the patient's functional status. Nurses have traditionally focused solely on assessing the physical condition and have not conducted comprehensive assessments encompassing the physical, mental, and social aspects of patients, particularly in low- and middle-income countries or in countries with limited resources like Indonesia. A comprehensive assessment will influence the management of hemodialysis patients. Physical, mental, and social conditions require separate

management in hemodialysis patients, which begins with a comprehensive assessment. Nephrology nurses can provide psychological support to patients with CKD. This can be achieved through a comprehensive assessment that focuses not only on physical conditions but also on the patient's overall mental health. However, this study has several limitations, including a relatively small sample size, a self-reporting instrument, which can introduce bias and limit generalizability, and an uneven distribution of hospitals. Future research should utilize a larger, multicenter sample.

Relevance to Practice

Optimal nursing care can be achieved through a comprehensive assessment that focuses not only on the patient's physical condition but also on their overall mental health. Psychological screening can be integrated into the care of hemodialysis patients to provide holistic care. Updating nephrology nursing protocols to include structured mental health assessments ensures evidence-based and culturally responsive care. This holistic assessment can be incorporated into nursing education, staff training, and institutional guidelines, thereby supporting evidence-based, patient-centered care.

Conclusion

Mental health and emotional role issues in patients with chronic kidney disease (CKD) undergoing hemodialysis are still understudied, thus negatively affecting their quality of life. It is essential for healthcare professionals to recognize the importance of comprehensive assessments that consider not only the physical but also the mental health and emotional role aspects of these patients. Many patients undergoing hemodialysis have poor mental health and emotional role functioning. Factors such as hemoglobin levels and years on hemodialysis are significantly associated with improvements in mental health and emotional roles in patients with CKD. Providing psychological support for patients with CKD undergoing hemodialysis is essential. Achieving this requires a holistic approach that goes beyond managing physical conditions and emphasizes patients' overall mental health. Updating nephrology nursing protocols to include a structured mental health assessment ensures evidence-based, culturally responsive care.

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CrediT Authorship Contributions Statement

Adiyati Mardiyah: Conceptualization, Methodology, Supervision, Writing – Original Draft, Writing – Review & Editing.

Erna Julianti: Methodology, Validation, Formal Analysis, Data Curation, Writing – Review & Editing.

Zulkifli: Investigation, Resources, Data Curation, Formal Analysis, Writing – Review & Editing.

Lyah Giovana: Investigation, Data Curation, Visualization, Writing – Original Draft, Writing – Review & Editing.

Dian Tri Raharjo: Supervision, Project Administration, Resources, Funding Acquisition, Writing – Review & Editing.

Conflicts of Interest

There is no conflict of interest.

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