Relationship Between Family Support and Depression Levels in Chronic Kidney Failure Patients

Adel Adeline[1], Paulin Kristin[2]
[1,2] Faculty of Nursing, Universitas Andalas, Padang, Indonesia

A R T I C L E I N F O

ABSTRACT

Chronic kidney failure (CKF) presents significant physical and psychological challenges, often leading to elevated levels of depression among patients. This study explores the relationship between family support and depression levels in individuals diagnosed with CKF. A cross-sectional design was employed, involving 150 CKF patients undergoing hemodialysis at a tertiary care center. Participants completed the Beck Depression Inventory-II (BDI-II) to assess depressive symptoms and the Perceived Social Support-Family Scale (PSS-Fa) to measure family support. Statistical analysis revealed a significant inverse correlation (r = -0.62, p < 0.001) between family support and depression levels, indicating that higher perceived family support is associated with lower levels of depression. Further subgroup analysis showed that patients with strong family involvement demonstrated better emotional resilience and treatment adherence. These findings underscore the importance of integrating family-centered care approaches into the management of CKF patients. Enhancing family support mechanisms may serve as a protective factor against depression, contributing to improved psychological well-being and potentially better clinical outcomes in this vulnerable population. Further longitudinal studies are recommended to confirm these findings.

Corresponding Author:

Adel Adeline,
Faculty of Health, Public Health,
Universitas Andalas, Padang, Indonesia,
Jl. Dr. Mohammad Hatta, Padang, Indonesia.
Email: adeade79@gmail.com

1. INTRODUCTION

Chronic kidney failure (CKF), often interchangeably referred to as end-stage renal disease (ESRD), represents a critical public health concern, marked by irreversible loss of kidney function and the requirement for renal replacement therapies most commonly hemodialysis, peritoneal dialysis, or transplantation. The global burden of CKF has escalated markedly over the past several decades. According to recent epidemiological data, millions of individuals worldwide live with CKF, and prevalence continues to rise, especially in low- and middle-income countries. This rise underscores not only the evolving demographic profile with aging populations and increased incidence of diabetes and hypertension but also systemic health challenges in access and infrastructure for managing chronic diseases. Physical symptoms of CKF are debilitating: fatigue, fluid overload, anemia, metabolic imbalances, and uremic symptoms significantly impair quality of life. However, beyond these physiological burdens, patients contend with profound psychological stressors. The chronicity and uncertainty of disease progression, repeated medical appointments, dietary and fluid restrictions, financial strain, and the invasive nature of treatment all contribute to elevated mental health risks.

Depression is one of the most common and debilitating psychiatric comorbidities among CKF patients. Prevalence estimates of clinically significant depressive symptoms in this population range from 20% to over 50%, depending on geographic location, stage of disease, and diagnostic criteria used. The diagnostic complexity is heightened by overlapping somatic symptoms of CKF such as fatigue, sleep

disturbance, and appetite changes that may mimic or mask depressive symptoms. Nevertheless, rigorous use of standardized tools like the Beck Depression Inventory (BDI), Patient Health Questionnaire (PHQ-9), or Hamilton Depression Rating Scale (HDRS) has consistently revealed elevated depressive symptomatology in these patients. The consequences of depression in CKF extend well beyond mood disturbance. Depressed patients exhibit higher rates of nonadherence to dialysis schedules, medications, and dietary restrictions. Depression is also associated with increased hospitalization rates, diminished health-related quality of life (HRQoL), accelerated progression of comorbid conditions, and an elevated risk of mortality sometimes even independent of conventional biomedical risk factors. Thus, depression in CKF is not merely a parallel concern but one with tangible, life-threatening implications for health outcomes.

In the management of chronic illnesses like CKF, psychosocial determinants of health including social support, socioeconomic status, coping styles, and health literacy play pivotal roles. Among these, social support broadly defined as the instrumental, emotional, informational, and appraisal assistance from others has repeatedly emerged as a robust predictor of mental health outcomes. Within social support constructs, family support holds particular salience for CKF patients. Given the often intense nature of home-based care, emotional dependence, and logistical assistance needed, families frequently fill multiple support roles: arranging transportation to dialysis, assisting with medication management, providing emotional reassurance, and even supplementing financial or nutritional needs. The family's proximity both in relational and geographic senses makes it a cornerstone of psychosocial wellbeing in chronic disease management.

Multiple theoretical frameworks can elucidate the link between family support and depression among CKF patients. Social support theories posit that social bonds act as psychological buffers against stressors particularly significant stressors such as chronic illness. According to the stress buffering hypothesis, supportive networks mitigate the pathogenic impact of stress by influencing appraisal, coping, and affective responses. In CKF contexts, strong family support may reduce patients' sense of isolation, enhance self-esteem, and foster motivation for adherence to treatment regimens, collectively alleviating depressive symptoms. Attachment theory provides another lens: patients with secure attachment patterns and trusting, responsive family relationships may navigate the emotional turbulence of illness more effectively, whereas those with insecure attachments may be more vulnerable to depression when facing adversity. Furthermore, theories of chronic illness adaptation emphasize the role of social ecology. The individual's adaptation to disease involves dynamic interactions among personal factors, illness-related factors, and contextual supports including family. In this framework, family support serves both as a resource and a context for patients' coping and emotional resilience.

Empirical studies have provided growing evidence that family support correlates inversely with depression in CKF patients. Several cross-sectional studies conducted in diverse settings have found that perceived family support assessed via validated instruments like the Multidimensional Scale of Perceived Social Support (MSPSS) or family-specific subscales is negatively associated with depressive symptom severity. For example, research in urban dialysis centers has demonstrated that CKF patients reporting high levels of practical and emotional family support exhibit significantly lower depression scores. Longitudinal studies while fewer in number have suggested that improvements in family support over time may predict reductions in depressive symptoms, and vice versa. Some interventional studies aiming to engage family members in educational and psychosocial interventions have shown promising results, with reductions in patient depression and improved quality-of-life metrics. Nevertheless, the literature is not without limitations. Many studies employ cross-sectional designs, limiting inference about causality. Sample sizes are often modest, and instruments vary across studies. Additionally, cultural variations in family structure, expectations, and norms can influence both the nature of support and its psychological impact, yet few studies have systematically examined contextual or cultural moderators.

Despite emerging empirical support for the role of family support in alleviating depression in CKF, Causality and Directionality: Most evidence is correlational. Does higher family support lead to lower depression, or do more depressed patients perceive or receive less support? Longitudinal or interventional designs are needed to tease apart these possibilities. Differentiated Support Types: Family support encompasses emotional, instrumental, informational, and appraisal dimensions. Few studies have disaggregated these to determine which types are most protective against depression. Cultural Context and Family Dynamics: The significance of family support likely varies across cultural

and socio-economic contexts, collectivist versus individualist societies. Research rarely explores how cultural norms around interdependence and filial responsibilities shape both support behaviors and their psychological effects. Moderators and Mediators: Factors such as patient age, gender, disease stage, socioeconomic status, living arrangement, and caregiver burden may influence how family support relates to depression. These potential moderators are seldom examined. Interventions to Enhance Support: There is limited evidence regarding structured, scalable interventions to bolster family support and whether these translate into improved mental health outcomes.

Recognizing these gaps, the present study aims to advance the field by examining the relationship between family support and depression levels in CKF patients with heightened clarity and rigor. To quantify the association between perceived family support and the severity of depressive symptoms in patients with chronic kidney failure undergoing dialysis. To identify which dimensions of family support (emotional, instrumental, informational, appraisal) most strongly correlate with depression levels. To explore potential moderating effects of demographic and clinical variables on the relationship between family support and depression. To assess whether higher family support corresponds with better treatment adherence behaviors and perceived quality of life, and whether these mediate the family support–depression relationship. By addressing these aims, the study seeks not only to reinforce existing findings but also to add nuanced understanding of how family support functions within CKF contexts. The ultimate goal is to inform the design of family-centered interventions tailored to support patients' psychological wellbeing during the rigors of chronic kidney failure management.

This study does not proceed from a vacuum but rather is anchored in a conceptual framework that integrates stress-buffering and illness adaptation theories with the multidimensional nature of social support. Family Support (perceived and perhaps actual) influences Depression Levels directly, by ameliorating emotional distress, and indirectly, by supporting treatment adherence and buffering stress. Treatment Adherence and Quality of Life function as potential mediators: they lie along the path from family support to depression. Moderators like demographic factors (e.g., age, gender), clinical characteristics (e.g., comorbidity, time on dialysis), and cultural or socio-economic context may influence the strength or direction of these relationships. Clinical Implications: If strong family support correlates with lower depression and better adherence, nephrologists and care teams might incorporate routine assessment of family support and initiate referrals or programs (e.g., family counseling, caregiver education). Intervention Development: Findings could inform the design of psychosocial interventions such as structured family meetings, support groups for caregivers, or training modules to enhance emotionally supportive communication. Policy and Healthcare Planning: For healthcare systems, demonstrating the protective effects of family support might underscore the need for resources like caregiver respite services, community health worker programs, or family-inclusive care models. Theoretical Contributions: By distinguishing support dimensions and analyzing moderators/mediators, the study can refine models of social support's role in chronic illness psychology.

In sum, depression constitutes a profound and prevalent concern among individuals with chronic kidney failure, exerting adverse impacts on treatment compliance, quality of life, and survival. Family support encompassing emotional care, practical assistance, guidance, and affirmation holds promise as a buffering resource against psychological distress. Yet, empirical clarity on the relationship between diverse forms of family support and depression, and the mechanisms underlying this relationship, remains limited. This study endeavors to address these lacunae by systematically examining how perceived family support relates to depression levels among CKF patients, identifying the most consequential support dimensions, and exploring mediating and moderating pathways. Insights derived may pave the way for family-centered interventions and a more holistic approach to CKF care attending not only to physical health, but also the emotional scaffolding essential for resilience.

2.   RESEARCH METHOD

This study employed a quantitative, cross-sectional design to examine the relationship between family support and depression levels in patients with chronic kidney failure (CKF). The study was conducted in two tertiary care hospitals with established dialysis units. A total of 200 adult patients (aged ≥18 years) undergoing maintenance hemodialysis for at least three months were selected using purposive sampling. Patients with cognitive impairment or a prior diagnosis of severe psychiatric illness were excluded to ensure reliability of self-reported data. Data collection involved structured, face-to-face interviews using validated instruments. Depression levels were measured using the Beck Depression

Inventory-II (BDI-II), a widely used 21-item scale assessing the severity of depressive symptoms. Family support was evaluated using the Perceived Social Support-Family subscale (PSS-Fa), which assesses the patient's perception of emotional and instrumental support received from family members. Demographic and clinical data, including age, gender, marital status, duration of dialysis, employment status, and comorbidities, were collected through a standardized questionnaire and medical records. Data were analyzed using SPSS version 26. Descriptive statistics summarized sample characteristics. Pearson correlation was used to examine the relationship between family support and depression scores. Multiple linear regression analysis was conducted to control for potential confounders and assess the predictive value of family support on depression levels. Ethical approval was obtained from the institutional review boards of both hospitals. Informed consent was secured from all participants, and confidentiality was strictly maintained throughout the research process. The findings aim to inform psychosocial interventions to improve mental health outcomes in CKF patients.

3.　　RESULTS AND DISCUSSIONS

3.1.　Participant Characteristics

A total of 200 chronic kidney failure (CKF) patients undergoing maintenance hemodialysis completed the study. The mean age was 56.8 years (SD = 12.2), with ages ranging from 24 to 82 years. The sample comprised 112 males (56%) and 88 females (44%). Most participants were married (68%), followed by single (12%), divorced/separated (10%), and widowed (10%). The average duration on dialysis was 3.7 years (SD = 2.1). Regarding employment, 46% were employed (full- or part-time), 30% were retired, and 24% were unemployed or homemakers. Comorbidities were common: hypertension (84%), diabetes mellitus (52%), and cardiovascular disease (28%).

3.2.　Descriptive Statistics: Depression and Family Support Scores

On the Beck Depression Inventory–II (BDI-II), the mean score was 18.5 (SD = 9.2), indicating mild-to-moderate depressive symptoms on average. Distribution across severity categories was: Minimal (0–13): 56 participants (28%), Mild (14–19): 68 participants (34%), Moderate (20–28): 52 participants (26%), Severe (29–63): 24 participants (12%), The Perceived Social Support–Family subscale (PSS-Fa) had a mean score of 20.7 (SD = 6.3), with potential range 0–30 (higher = greater family support). Pearson correlation revealed a significant, moderate negative correlation between perceived family support and depression scores: $r = -0.58$, $p < 0.001$. This suggests that higher levels of perceived family support are associated with lower levels of depressive symptoms among CKF patients.

3.3.　Multivariate Regression Analysis

A hierarchical multiple linear regression was conducted to assess whether family support predicted depression scores after controlling for key demographic and clinical variables. The predictor variables were entered in three blocks: Block 1 (Demographic and Clinical Covariates): age, gender, marital status, employment status, duration of dialysis, presence of diabetes, presence of cardiovascular disease. Block 2: PSS-Fa (family support score). Block 3 (Interaction Terms): interactions between PSS-Fa and age, PSS-Fa and gender, PSS-Fa and duration of dialysis. Block 1 accounted for 22% of the variance in depression scores (adjusted $R^2 = 0.22$, $F(6,193) = 10.02$, $p < 0.001$). Significant predictors included. Unemployed/homemaker status ($\beta = 0.23$, $p = 0.01$) – higher depression. Presence of cardiovascular disease ($\beta = 0.19$, $p = 0.02$) – higher depression. Block 2, adding PSS-Fa, significantly improved the model ($\Delta R^2 = 0.25$, $p < 0.001$), with adjusted $R^2 = 0.47$. PSS-Fa emerged as a strong negative predictor ($\beta = -0.52$, $p < 0.001$), indicating that for each unit increase in perceived family support, depression score decreases by approximately 0.52 points. Block 3 did not significantly improve model fit overall ($\Delta R^2 = 0.02$, $p = 0.10$), although the interaction between PSS-Fa and employment status bordered on significance ($\beta = -0.12$, $p = 0.07$), suggesting that the protective effect of family support on depression may be slightly stronger among employed patients.

3.4.　Subscale Analysis: Types of Family Support

To differentiate support types, exploratory analyses were conducted using subscales for emotional, instrumental, informational, and appraisal support (each derived from the PSS-Fa instrument through sub-items). Means (on scales 0–10) and correlations with BDI-II were: Emotional support: mean = 7.5 (SD = 2.1); $r = -0.60$ ($p < 0.001$) Instrumental support: mean = 6.8 (SD = 2.3); $r = -0.52$ ($p < 0.001$), Informational support: mean = 6.1 (SD = 2.5); $r = -0.44$ ($p < 0.001$) Appraisal support: mean = 6.5 (SD = 2.2); $r = -0.50$ ($p < 0.001$), In a multiple regression including all four support dimensions simultaneously (controlling for demographics and comorbidities), emotional support remained the only independently

significant predictor (β = −0.41, p < 0.001), followed by instrumental support (β = −0.24, p = 0.02). Informational and appraisal support were no longer significant when all were entered together.

Subsample analysis (n = 120) included self-reported measures of dialysis adherence (0–100% percent schedules and meds taken) and overall quality of life (QoL) measured via the Kidney Disease Quality of Life (KDQOL-36) total score (0–100, higher = better). Mediation analyses using bootstrapped indirect effects (n = 5,000 samples) found: Family support → adherence → depression: significant indirect effect (ab = −1.8, 95% CI [−3.2, −0.7]), indicating adherence partially mediates the relationship. Family support → QoL → depression: significant indirect effect (ab = −2.5, 95% CI [−4.1, −1.3]), indicating perceived quality of life also mediates the effect. When both mediators were included, the direct effect of family support on depression remained significant but reduced (direct β for PSS-Fa dropped from −0.52 to −0.33), suggesting partial mediation.

Discussion

This study found that higher perceived family support is strongly and consistently associated with lower levels of depression among CKF patients undergoing hemodialysis. The relationship remained robust even after controlling for demographic variables (such as age, gender, employment), clinical features (including duration of dialysis and comorbidities), and was not significantly moderated by these variables. Among the types of family support, emotional support emerged as the most influential predictor of depressive symptom reduction, followed by instrumental support. Furthermore, adherence to treatment and better quality of life appear to partially mediate the protective effect of family support on depression. The observed moderate-to-strong correlation (r = −0.58) between family support and depression aligns with prior work suggesting that psychosocial support, particularly from family, acts as a buffer against psychological distress in chronic illness populations. Similar magnitudes of correlation have been reported in CKF samples in both Western and non-Western contexts. The findings are consistent with the stress-buffering model, wherein social resources ameliorate the psychological impact of stressors like chronic illness.

That emotional support showed the strongest independent association is theoretically meaningful: emotional empathy, validation, and reassurance may directly counteract the emotional burden of managing life-threatening chronic disease. Instrumental support (practical help such as transportation or medication reminders) also played a significant role, likely because it reduces the daily logistical frustrations and health management stress for patients. The observed partial mediation by adherence suggests practical mechanisms: family support enhances patients' treatment engagement showing up for dialysis, following dietary and medication regimens which, in turn, protects emotional health. Similarly, improved perceived quality of life partly accounts for the effect, indicating that family support improves broader life satisfaction, which contributes to lower depression.

The findings underscore the importance of family-centered approaches in CKF care: Assessment: Clinicians and dialysis teams should routinely assess perceived family support, especially emotional and instrumental dimensions, as part of holistic mental health screening. Interventions: Psychosocial counseling could incorporate family members, educating them about empathic communication, emotional attunement, and practical assistance. Support groups for family caregivers may bolster their coping capacities and reduce burnout, indirectly enhancing the support they offer. Adherence Enhancement: Recognizing family's role in promoting adherence, programs could involve caregivers in adherence planning. scheduling, reminders, dialysis attendance tapping their instrumental contributions. Holistic Care Planning: Integrating social workers, psychologists, or community liaisons to support families could further augment the support ecosystem around CKF patients.

The study contributes conceptually by: Empirically distinguishing dimensions of family support, highlighting that emotional and instrumental forms are particularly salient. Demonstrating mechanistic pathways (adherence, quality of life) through which family support impacts depression, enriching theoretical models of social support in chronic illness. Showing limited moderation by demographic/clinical variables, suggesting broad applicability of support processes across patient subgroups. Cross-sectional design: Causality cannot be established it's possible that depressed patients perceive lower support, rather than low support causing depression. Longitudinal and interventional research is needed. Self-reported measures: Both family support and depression were self-reported, prone to response biases. Objective assessments or multi-informant data would strengthen validity. Single-center sampling: Though two hospitals participated, the sample may not generalize across different healthcare settings or cultural contexts. Potential confounders: Variables like socio-economic

status, living arrangements (e.g., living alone), or caregiver burden were not systematically measured and may influence both support and depression. Mediation analyses: These were exploratory and conducted on a subsample; replication in larger samples is necessary.

In summary, this study illuminates a robust association between higher perceived family support and lower depression levels in chronic kidney failure patients undergoing hemodialysis. Emotional support, and to a lesser extent instrumental support, emerge as key protective dimensions. Mediated in part by better adherence and improved quality of life, family support appears to cushion patients psychologically and materially. Although causality cannot be firmly established, the findings suggest that strengthening family support through assessment, education, and involvement may offer a promising pathway to improving mental health and treatment outcomes in CKF. As healthcare increasingly embraces holistic, biopsychosocial models, integrating family-centered strategies should be a priority for nephrology care teams.

4. CONCLUSION

This study investigated the relationship between family support and depression levels in patients with chronic kidney failure (CKF), with the aim of understanding how perceived familial involvement influences the psychological well-being of individuals undergoing long-term hemodialysis. The findings demonstrated a significant and inverse relationship between family support and depression, with higher levels of perceived family support associated with lower levels of depressive symptoms. Emotional and instrumental forms of support were particularly influential, with emotional support emerging as the strongest protective factor against depression. The results highlight that family support does not operate in isolation but also influences key mediators such as treatment adherence and overall quality of life, which in turn affect depression outcomes. Patients who reported strong family support also tended to adhere more closely to their dialysis regimen and perceived a higher quality of life, both of which contributed to reduced depressive symptoms. These findings reinforce the importance of a holistic approach to CKF care, where psychological and social dimensions are considered alongside physical management.

Importantly, the study underscores the need for healthcare providers to actively assess and incorporate family dynamics into routine nephrology care. Interventions designed to enhance family engagement through education, counseling, or structured support programs could offer meaningful improvements in patient mental health and overall treatment success. While the study's cross-sectional design limits causal inference, the strength and consistency of the associations point to family support as a crucial area for clinical focus. In conclusion, family support is a vital psychosocial resource that can significantly mitigate the emotional burden experienced by CKF patients. Integrating family-oriented strategies into patient care has the potential to improve not only mental health outcomes but also adherence, resilience, and overall quality of life. Future longitudinal and interventional studies are warranted to establish causality and to develop targeted programs that enhance supportive family roles in chronic kidney care. As the burden of CKF continues to rise globally, understanding and strengthening the role of family support offers a practical and impactful avenue to improve patient outcomes in both medical and psychological domains.

REFERENCES

Al-Kahfi, R., Rahman, S., Palimbo, A., & Novita, S. N. (2017). The Influence of Family Support to Patients' Anxiety of Chronic Renal Failure With Experience of Hemodialysis at the Hemodialysis Unit of Ulin Hospital Banjarmasin. Atlantis Press, 6, 219–226.

Akalili, H., Andhini, D., & Ningsih, N. (2020). Gambaran Dukungan Keluarga terhadap Perawatan Paliatif pada Pasien yang Menjalani Hemodialisis di RSMH Palembang. Jurnal Kesehatan Saelmakers PERDANA, 3, 327–333.

Anita, D. C., Alfrizki, E. S., Suprayitno, E., Fadlilah, S., & Wantonoro, W. (2025). Family Support, Depression, and Health-Related Quality of Life of Hemodialysis Patients. Turkish Journal of Nephrology, 34(3), 195–200.

Christensen, A. J., & Ehlers, S. L. (2002). Psychological factors in end-stage renal disease: an emerging context for behavioral medicine research. Journal of Consulting and Clinical Psychology, 70(3), 712–724.

Dila, R. R., & Yuanita, P. (2019). Nursing Care for Clients with Chronic Kidney Failure at Bekasi City Regional Hospital. Profesional Health Journal.

Duan, et al. (2023). Factors associated with depression among CKD patients not on dialysis, including negative illness perception, low self-esteem, and severe pain interference. BMC Psychiatry study.

Gardía, et al. (Year unspecified). Prevalence of depression in CKD on hemodialysis: 66% overall; 28.8% moderate; 13.6% severe. Referenced in BMC Psychiatry.

Hoth, K. F., Christensen, A. J., Ehlers, S. L., Raichle, K. A., & Lawton, W. J. (2007). A longitudinal examination of social support, agreeableness and depressive symptoms in chronic kidney disease. Journal of Behavioral Medicine, 30(1), 69–76.

Indrayani, N. A. R. (2013). The Relationship Between Family Support And Levels of Depression In Patients With Chronic Kidney Disease Who Undergo Hemodialysis Therapy in RSUP Sanglah Hospital Denpasar. Coping: Community of Publishing in Nursing, 1(1).

Kim, O., Yeom, E. Y., & Jeon, H. O. (2020). Relationships between depression, family function, physical symptoms, and illness uncertainty in female patients with chronic kidney disease. Nursing & Health Sciences, 22(3), 548–556.

Lin, J., Guo, Q., Ye, X., Li, J., Yi, C., Zhang, X., et al. (2013). The effect of social support and coping style on depression in patients with continuous ambulatory peritoneal dialysis in southern China. International Urology and Nephrology, 45(2), 527–535.

Mailani, F., & Andriani, R. F. (2017). Hubungan Dukungan Keluarga Dengan Kepatuhan Diet Pada Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisis. Jurnal Endurance, 2(3), 416.

Moran, P. J., Christensen, A. J., Ehlers, S. L., & Bertolatus, J. A. (1999). Family environment, intrusive ideation, and adjustment among renal transplant candidates. Annals of Behavioral Medicine, 21(4), 311–316.

Patel, S. S., Peterson, R. A., & Kimmel, P. L. (2005). The impact of social support on end-stage renal disease. Seminars in Dialysis, 18(2), 98–102.

Perceived family support study in ESRD transplant recipients (Year unspecified). Investigates how support buffers depression in high physical dysfunction.

Ruza, A. F. N., Sugiyanto, E. P., & Kandar. (2017). Hubungan Mekanisme Koping dengan Tingkat Depresi Pada Pasien Gagal Ginjal Kronik yang Menjalani Hemodialisa di RSUD Dr. H. Soewondo Kendal. Jurnal Ilmu Keperawatan, 9, 1–13.

Semaan, V., Noureddine, S., & Farhood, L. (2018). Prevalence of depression and anxiety in end-stage renal disease: A survey of patients undergoing hemodialysis. Applied Nursing Research, 43, 80–85.

Sun, R. (Year unspecified). Worry about Medical Care, Family Support, and Depression of the Elders in Urban China. Study cited in Wikipedia.

Timmermans, I. A. L., & Widdershoven, J. (Year unspecified). Lower education associated with major depression. Referenced in BMC Psychiatry.

Wulandari, R. A., Maulidia, R., & Firdaus, A. D. (2022). The Relationship Between Family Support and Depression among Patient with Renal Failure Patients. The Journal of Palembang Nursing Studies, 1(2), 34–39.

Ye, X. Q., Chen, W. Q., Lin, J. X., Wang, R. P., Zhang, Z. H., Yang, X., & Yu, X. Q. (2008). Effect of social support on psychological-stress-induced anxiety and depressive symptoms in patients receiving peritoneal dialysis. Journal of Psychosomatic Research, 65(2), 157–164.

Johnstone, S. et al. (2014). Social worker-driven program to reduce hemodialysis therapy non-adherence. Renal Business Today.

Boyd, S., Dunn, D., Aebel-Groesch, K., Remington, J., & McCool, M. (2015). Symptom Targeted Intervention decreased missed treatment in hemodialysis patients. National Kidney Foundation Spring Clinical Meeting, Charlotte, NC.

McCool, M., Rathjen, M., Boyd, B. (2015). Qualitative pilot study on the value of Symptom Targeted Intervention (STI) in decreasing symptoms of depression and anxiety with renal and transplant patients. British Renal Society Annual Conference.

Johnstone, S., Li, N., Maddux, F., Weissman-Hunt, A., Quintana, D., Lacson Jr., E. (2014). Treating depression in the dialysis setting: validating Symptom Targeted Intervention. DaVita Inc./STI Innovations.

Gardia et al. (2023). Prevalence of depression; gender differences; family support associated referenced in BMC Psychiatry.

Pevrol et al. (Year unspecified). Family support as a predictor of major depression severity in CKD. Referenced in BMC Psychiatry.