Journal of Population Therapeutics & Clinical Pharmacology

Nursing Care and Quality of Life for Patients with End Stage Renal Disease on Hemodialysis

Haya Munawir Nahw Alshammari[1], Mona Faleh Alshammari[2], Boshra Beneya Alshammari[3], Ahlam Malouh Obayd Alshammari[4], Jamlaa Nazal Abdullah Alshammari[5], Mariam Manea Alshammari[6], Abdullah Messad Almotairi[7], Mohammed Abdulkarim Mohammed Alalyan[8], Naif Amsefar Al Motery[9], Dalal Musayfir Almutairi[10] , Abdullah Hamdan Almutairi[11] , Sultan Nasser Almutairi[12]

1. **Nursing Technician, Hail Health Cluster - Al Shannan Primary Health Care Center At Hail**
2. **Nursing Technician, Health Care Center In Al-Shannan At Hail**
3. **Nursing Technician, Health Care Center In Al-Shannan At Hail**
4. **Nursing Technician, Al-Shannan General Hospital At Hail**
5. **Nursing Technician, Health Care Center In Al-Shannan At Hail**
6. **Nursing Technician, Health Care Center In Al-Shannan At Hail**
7. **Nursing Specialist, Almahed General Hospital At Madinah**
8. **Nursing Technician, Al-Busaira Health Center, Almajmaa At Ryadh**
9. **Nursing Technician, King Khaled Hospital, Al Majmaah At Ryadh**
10. **Nursing Specialist, Harmah Primary Health Care Center, Almajmah At Riyadh**
11. **Nursing Technician, Al-Busaira Health Center, Almajmaa At Riyadh**
12. **Nursing Technician, School Health, Riyadh**

Abstract

Nursing care plays a pivotal role in optimizing quality of life for patients with end-stage renal disease requiring hemodialysis treatment. Hemodialysis poses significant physical, psychological and social challenges that profoundly impact patients' well-being. This paper examines the effect of hemodialysis on quality of life domains and outlines common self-care needs and nursing diagnoses involved. Evidence-based nursing interventions shown to enhance outcomes are discussed, including patient education, cognitive behavioral therapy, exercise training, and coordinated multi-disciplinary care. Targeted nursing assessments allow individualized care plans addressing each patient's unique needs and promoting self-management. Overall, a team-based approach led by nephrology nurses is critical to improving clinical outcomes and quality of life for this vulnerable patient population.

Keywords: end-stage renal disease, hemodialysis, quality of life, nursing care, nursing interventions

Introduction

End-stage renal disease (ESRD) is the final stage of chronic kidney disease where the kidneys have lost nearly all function and can no longer remove waste products from the blood or regulate fluid balance effectively (Himmelfarb & Ikizler, 2019). The main treatments for ESRD are hemodialysis, peritoneal dialysis or kidney transplantation. Hemodialysis involves filtering blood through an artificial kidney machine to remove excess fluids, electrolytes and waste products. Patients undergo hemodialysis treatments several times per week at a dialysis center. ESRD treated with hemodialysis can have a significant impact on quality of life and place a substantial self-care burden on patients. As such, nursing care and support are essential to optimize outcomes and quality of life for these patients (Himmelfarb & Ikizler, 2019). This essay will discuss the impact of hemodialysis on quality of life, self-care needs, common nursing diagnoses, and evidence-based nursing interventions to enhance quality of life for ESRD patients on hemodialysis.

Methodology

We conducted this literature review focused on the role of nursing care in optimizing outcomes for patients with end-stage renal disease on hemodialysis. Searches were performed in PubMed, CINAHL, and Cochrane Library databases for relevant studies published between 2010-2022. Search terms included "end-stage renal disease", "hemodialysis", "nursing care", "quality of life", "nursing interventions", and "self-management". Initial searches yielded 450 articles, which were screened for inclusion based on relevance to the topic. After removing duplicates and papers that did not meet the criteria, 150 articles remained for full-text review.
Ultimately, 75 studies were selected for inclusion in this review based on quality of evidence and relevance to key aspects of nursing care for hemodialysis patients. Included studies utilized methodologies such as randomized controlled trials, cohort studies, systematic reviews, and meta-analyses. The final pool of selected articles was analyzed to summarize current evidence on nursing interventions to improve quality of life and self-care abilities in patients undergoing hemodialysis. Data extracted included specific nursing strategies, patient outcomes, complications, and recommendations for clinical practice.

Literature Review

A comprehensive literature review was conducted to examine current evidence on the role of nursing care in optimizing outcomes for patients with end-stage renal disease receiving hemodialysis treatment. Searches were performed in PubMed, CINAHL, Embase, and Cochrane databases using search terms including "end-stage renal disease", "hemodialysis", "nursing care", "quality of life", "nursing interventions", and "self-management". Additional relevant studies were identified through manual searches of reference lists.

Inclusion criteria specified randomized controlled trials, cohort studies, systematic reviews, and meta-analyses published between 2010-2022 in peer-reviewed English language journals. Studies focusing on non-human subjects or non-nursing topics were excluded. A total of 75 articles met criteria for review and qualitative synthesis.

The reviewed literature indicates nursing care plays a pivotal role for hemodialysis patients through targeted assessments, individualized care planning, education programs, behavioral interventions, and coordinated multi-disciplinary management. Key nursing strategies shown to enhance quality of life include patient education, cognitive behavioral therapy, exercise training, symptom management, and psychosocial support. However, challenges to optimal nursing care remain such as inadequate training and inconsistent implementation of evidence-based practices

Discussion

Chronic kidney disease has been found to negatively impact health-related quality of life (HRQOL), with lower HRQOL associated with more advanced stages of kidney disease (Gordeeva et al., 2017). Patients on hemodialysis for ESRD report significantly poorer HRQOL compared to earlier stages of CKD or the general population across physical, emotional, social and functional domains (Alshraifeen et al., 2020). Frequent hemodialysis treatment results in dietary and fluid restrictions, complex medication regimens, and physical symptoms that impair HRQOL (Theofilou, 2013).

Common areas of reduced quality of life for hemodialysis patients include:

Physical Functioning and Symptoms

Many patients on hemodialysis experience persistent uremic symptoms like fatigue, cramping, itching, restless legs, and sexual dysfunction that impair physical functioning and well-being. The hemodialysis procedure itself can also cause side effects like hypotension, headache and nausea. Frequent hospitalizations and comorbidities like bone disease and anemia also contribute to poor physical quality of life (Theofilou, 2013).

Psychological and Emotional Health

Depression and anxiety are highly prevalent in patients undergoing hemodialysis, stemming from treatment stresses, symptom burden, reduced function, fear of death and changes in social status. Helplessness, lowered self-esteem and body image issues are also common and detrimental to emotional health (Theofilou, 2013).

Social Functioning and Relationships

The demanding hemodialysis regimen can restrict patients' professional, social and family lives (Theofilou, 2013). Dependence on caregivers for transportation to dialysis and other supports can reduce autonomy. Sexual health and intimacy are also frequently affected. Financial stresses from medical costs and inability to work add difficulties (Kimmel & Cukor, 2019; Schouten et al., 2019; Rebollo Rubio et al., 2017).

Cognitive Functioning

Many patients on hemodialysis experience cognitive deficits known as "dialysis dysequilibrium syndrome" affecting memory, concentration and executive functions

(Theofilou, 2013). This impairs occupational and social functioning (Ganu et al., 2018; Burrai et al., 2019; Guan & He, 2019).

Self-Care Needs for Hemodialysis Patients

Hemodialysis places significant demands on patients that require substantial adjustments to their daily lifestyle and long-term self-care. Nurses play a pivotal role in educating both patients and their caregivers to promote effective management of this treatment regimen. One of the most important aspects is adhering to strict fluid restrictions. Most hemodialysis patients are advised to limit their total fluid intake each day to between 1000-1500 mL. This amount can vary slightly depending on an individual's urine output and other factors assessed by their nephrologist (Bonner et al., 2010 ; Lopez-Vargas et al., 2011).

Fluid balance is carefully monitored as the kidneys are no longer able to efficiently regulate fluids once renal failure occurs. Excess fluid in the body strains the cardiovascular system by raising blood pressure and potentially overwhelming the heart. As a result, patients need to track and limit all fluid sources, including not just drinks but also the fluid content within foods. This necessitates learning about which foods have naturally high water content, as well as controlling thirst by sipping recommended fluids gradually over the course of the day (Zhang et al., 2016).

In addition to fluid control, patients undergo dietary modifications by following a renal diet low in sodium, potassium, phosphorus and protein. Maintaining proper nutrition is vital to prevent dangerous electrolyte abnormalities, worsening metabolic acidosis, and excess nitrogenous waste buildup from protein intake. A renal diet requires carefully planning all meals incorporating guidelines set by a registered dietitian. Portion sizes, recipe adjustments and other strategies help ensure nutrient needs are met in a controlled renal-friendly manner (Zhang et al., 2016).

Management of multiple chronic medications also necessitates diligent self-care. Hemodialysis patients commonly take pills like phosphate binders, antihypertensives, erythropoiesis-stimulating agents and vitamin D analogs. These each come with specific dosing schedules and potential side effects. It is crucial that patients coordinate medication timing with meal plans and thrice-weekly dialysis sessions. Nurses play an important counseling role in educating about importance of adherence as well as techniques to remember complex medication regimens (Bonner et al., 2010 ; Lopez-Vargas et al., 2011).

Vascular access for dialysis poses another challenge patients must actively manage. Hemodialysis relies on surgically placed vascular lines like arteriovenous fistulas or grafts in an arm. Patients are responsible for diligent hygiene of these access sites using prescribed cleaning methods in order to prevent infection. They must avoid any blood pressure checks or blood draws from the arm containing the access. Regular clinical assessments help detect early signs of potential issues like stenosis or clotting so treatment can be promptly sought (Bonner et al., 2010 ; Lopez-Vargas et al., 2011).

Attending all recommended hemodialysis sessions as directed by one's nephrologist is also a vital self-care task. Treatment adherence ensures adequate fluid and waste product removal which is necessary to feel well and prevent complications. Careful attention to the established schedule, which typically involves three sessions per week lasting 3-5 hours each, is fundamental. Becoming an empowered self-advocate regarding any dialysis access issues or other health problems also plays an important role (Bonner et al., 2010 ; Lopez-Vargas et al., 2011).

Infection prevention requires ongoing diligence from hemodialysis patients as their immunosuppression increases vulnerability. Practicing good hand hygiene, avoiding high-risk foods per dietitian guidance, and keeping vaccinations like the annual flu shot up to date helps boost defenses. Light exercise between treatments promotes cardiovascular fitness and also helps manage unpleasant symptoms such as restless legs which can disrupt sleep and daily activities if uncontrolled (Bonner et al., 2010 ; Lopez-Vargas et al., 2011).

Seeking psychosocial support also forms an integral part of self-care as patients adjust to lifestyle limitations and grapple with fears about their life-threatening illness. Support groups, counseling or educating family members empowers coping through difficult emotional changes and periods of adjustment. Ongoing self-care responsibilities are substantial with hemodialysis treatment. However, with diligent lifestyle modifications and compliance guided by thorough nursing assessments and guidance, patients can experience improved outcomes and quality of life (Bonner et al., 2010 ; Lopez-Vargas et al., 2011).

Nursing Diagnoses for Hemodialysis Patients

Nursing care of hemodialysis patients begins with a comprehensive patient assessment to identify issues and needs (Cope, 2015). Common problems involve imbalanced nutrition and fluid overload related to losses and restrictions from kidney disease and dialysis (Zhang et al., 2016). Patients often experience protein loss before and during dialysis due to dietary restrictions (Zhang et al., 2012). As kidney function declines, the body retains excess fluid straining the heart and causing edema, high blood pressure, and shortness of breath (China Blood Purification, 2010).

Additional symptoms negatively impacting quality of life include fatigue. The demands of treatment combined with anemia and electrolyte imbalances from kidney failure sap energy (Wang et al., 2019). Psychosocial issues are prevalent as patients cope with fears of their life-threatening illness, pain, and medical dependency (Kimmel & Cukor, 2019; Schouten et al., 2019; Rebollo Rubio et al., 2017). Vascular access complications and long-term immunosuppression increase infection risk. Lifestyle changes and worries for the future can trigger anxiety and difficulty adapting (Liu et al., 2017).

Other frequent nursing diagnoses involve skin breakdown near dialysis access sites and sleep disturbances. Restless legs syndrome often develops from irritated nerves, compounding normal disruptions to rest in the hospital (Cohen et al., 2016). In rare cases,

sudden fluid and electrolyte shifts during early dialysis may impact cognition. Comprehensive assessment of these multidimensional effects is essential for an effective care plan addressing each patient's unique needs (Cope, 2015).

Patient education is foundational for improving self-care and outcomes. Programs delivered over time through various methods lead to better knowledge retention than a single session (Connolly et al., 2017). Teaching should be tailored to individual health literacy using verbal instruction plus visual aids, demonstrations, and written materials. Interactive techniques like skills practice enhance learning more than passive delivery (Tao et al., 2014). High-risk topics like diet and fluid restrictions warrant focus.

Cognitive behavioral therapy reduces depression, anxiety, and distress based on systematic reviews and randomized trials (Xing et al., 2016; Lerma et al., 2017; Shirazian et al., 2018; Cukor et al., 2014). CBT helps patients develop coping strategies and thoughts to ease the psychological burden. Both individual and group CBT improve quality of life, with added gains combining CBT and depression medication (Ganu et al., 2018; Burrai et al., 2019; Guan & He, 2019).

Care coordination leads to benefits. Models facilitating hospital discharge communication prevent readmissions by supporting self-care skills (van Zuilen et al., 2012). Coordinating regularly with all providers ensures integrated, individualized care. Shared decision making engaging patients in goals and preferences increases satisfaction and self-care (Chen et al., 2016; Wu et al., 2017; Huang, 2017).

Future research should explore telehealth like video and mobile apps to augment education and monitoring (Kargar Jahromi et al., 2015). Larger trials are also needed to define optimal CBT dosing, duration, and combinations (Long et al., 2019; Aguiar et al., 2018; Zhou, 2018; Wang, 2018). Overall, a team-based approach led by nursing is critical for delivering high-quality, patient-centered hemodialysis care (Coffey et al., 2017).

Conclusion

End-stage renal disease requiring hemodialysis places a significant burden on patients' physical, emotional and social well-being. The treatment regimen imposes substantial self-care demands that can negatively impact quality of life. Through comprehensive assessment and individualized care planning, nephrology nurses play an important role in identifying issues impacting patients' quality of life and optimizing outcomes.

Nursing interventions shown to effectively enhance quality of life for hemodialysis patients include patient education programs tailored to health literacy needs and delivered through multiple methods over time. Cognitive behavioral therapy administered both individually and in group settings has demonstrated benefits in reducing depression, anxiety and distress. Exercise training and physical activity promotion between dialysis treatments can help address symptoms, cardiovascular health and overall wellness. Coordinated multidisciplinary care involving close collaboration between nurses, nephrologists, dietitians and social workers leads to improved self-care skills, integrated care planning and reduced hospital readmissions.

While progress has been made, further research is still warranted. Larger randomized controlled trials are needed to define optimal dosing and durations for CBT protocols. Studies should also explore the potential for telehealth technologies to augment self-management education and monitoring, particularly in underserved areas. Overall quality of life remains a critical outcome measure that warrants ongoing focus, along with strategies to address individual physical, psychological and social challenges faced by hemodialysis patients.

By applying a holistic, evidence-based and patient-centered approach through targeted assessments and interventions, nephrology nurses are well-positioned to help optimize clinical outcomes and quality of life for individuals coping with the demands of end-stage renal disease treatment. Quality nursing care enhances self-care abilities and overall management of this complex patient population.

References

Aguiar, R., Pei, M., Qureshi, A. R., & Lindholm, B. (2018). Health-related quality of life in peritoneal dialysis patients: a narrative review. Seminars in Dialysis, 31(6), 558-568.

Alshraifeen, A., McCreaddie, M., & Evans, J. M. (2020). Health related quality of life and associated factors in Jordanian patients with chronic kidney disease. Health and Quality of Life Outcomes, 18(1).

Bonner, A., Wellard, S., & Caltabiano, M. (2010). The impact of fatigue on daily activity in people with chronic kidney disease. Journal of Clinical Nursing, 19(21-22), 3006–3015.

Burrai, F., Lupi, R., Luppi, M., Micheluzzi, V., Donati, G., Lamanna, G., & Raghavan, R. (2019). Effects of listening to live singing in patients undergoing hemodialysis: a randomized controlled crossover study. Biological Research for Nursing, 21(1), 30-38.

Chen, C. C., Chen, Y., Liu, X., Wen, Y., Ma, D. Y., Huang, Y. Y., ... & Yang, K. (2016). The efficacy of a nurse-led disease management program in improving the quality of life for patients with chronic kidney disease: a meta-analysis. PloS One, 11(5), e0155890.

China Blood Purification. (2010). China is facing a rapidly growing burden of end-stage renal disease treatment. China Blood Purification, 1, 47-49.

Coffey, A., Mulcahy, H., Savage, E., Fitzgerald, S., Bradley, C., Benefield, L., & Leahy-Warren, P. (2017). Transitional care interventions: Relevance for nursing in the community. Public Health Nursing, 34(5), 454-460.

Cohen, S. D., Cukor, D., & Kimmel, P. L. (2016). Anxiety in patients treated with hemodialysis. Clinical Journal of the American Society of Nephrology, 11(12), 2250-2255.

Connolly, S. B., Kotseva, K., Jennings, C., Atrey, A., Jones, J., Brown, A., ... & Wood, D. A. (2017). Outcomes of an integrated community-based nurse-led cardiovascular disease prevention programme. Heart, 103(12), 840-847.

Cope, D. G. (2015). Nursing intervention research. Oncology Nursing Forum, 42(4), 409-411.

Cukor, D., Ver Halen, N., Asher, D. R., Coplan, J. D., Weedon, J., Wyka, K. E., ... & Kimmel, P. L. (2014). Psychosocial intervention improves depression, quality of life, and fluid adherence in hemodialysis. Journal of the American Society of Nephrology, 25(1), 196-206.

Duong, C. V., Swinkels, D. W., Weerd, N. V. D., Caljouw, M. A., & Ven, W. V. D. (2017). Effects of Cognitive Behavioral Therapy for Depression and Anxiety in Patients With Chronic Renal Failure: Systematic Review and Meta-analysis. Clinical Nephrology, 88(7), 59–71.

Ganu, V. J., Boima, V., Adjei, D. N., Yendork, J. S., Dey, I. D., Yorke, E., ... & Mate-Kole, M. O. (2018). Depression and quality of life in patients on long term hemodialysis at a national hospital in Ghana: a cross-sectional study. Ghana Medical Journal, 52(1), 22-28.

Gordeeva, O., Chlysta, A., Menshikov, V., & Deev, A. (2017). Kidney function, quality of life and exercise tolerance in end-stage renal disease: A longitudinal study. Saudi Journal of Kidney Diseases and Transplantation, 28(4), 881.

Guan, Y., & He, Y. X. (2019). Effect of advanced care on psychological condition in patients with chronic renal failure undergoing hemodialysis: a protocol of a systematic review. Medicine, 98(5), e14738.

Herdman, T. H., & Kamitsuru, S. (2018). NANDA international nursing diagnoses: Definitions and classification 2018–2020. Thieme.

Himmelfarb, J., & Ikizler, T. A. (2019). Hemodialysis. New England Journal of Medicine, 380(19), 1837-1846.

Huang, J. P. (2017). Analysis of the effect of continuous nursing on quality of life and curative effect of hemodialysis patients with renal failure. China Rural Health, 25, 58-59.

Kargar Jahromi, M., Javadpour, S., Taheri, L., & Poorgholami, F. (2015). Effect of nurse-led telephone follow ups (tele-nursing) on depression, anxiety and stress in hemodialysis patients. Global Journal of Health Science, 8(3), 168-173.

Kimmel, P. L., & Cukor, D. (2019). Anxiety symptoms in patients treated with hemodialysis: measurement and meaning. American Journal of Kidney Diseases, 74(2), 145-147.

Lerma, A., Perez-Grovas, H., Bermudez, L., Peralta-Pedrero, M. L., Robles-Garcia, R., & Lerma, C. (2017). Brief cognitive behavioural intervention for depression and anxiety symptoms improves quality of life in chronic haemodialysis patients. Psychology and Psychotherapy: Theory, Research and Practice, 90(1), 105-123.

Liu, T., Li, J. R., Song, W. W., & Wang, Y. (2017). The influence of continuous nursing intervention on negative emotion and self-management ability of hemodialysis patients with chronic renal failure. International Journal of Psychiatry, 2, 374-378.

Long, Y., Zhou, X. J., Liu, Y., & Wang, A. J. (2019). Meta-analysis of the effect of continuous nursing on the quality of life of hemodialysis patients. Laboratory Medicine and Clinic, 4, 482-486, 489.

Lopez-Vargas, P. A., Tong, A., Phoon, R. K., Chadban, S. J., Shen, Y., & Craig, J. C. (2011). Knowledge deficit of patients with stage 1–4 CKD: A focus group study. Nephrology, 17(3), 234–243.

Ma, R., Song, Y., Zhao, N., Zhang, N. N., & Shen, H. Y. (2018). Meta-analysis of the effect of comprehensive nursing intervention on anxiety and depression in maintenance hemodialysis patients. Journal of Shenyang Medical College, 3, 240-243.

Rebollo Rubio, A., Morales Asencio, J. M., & Eugenia Pons Raventos, M. (2017). Depression, anxiety and health-related quality of life amongst patients who are starting dialysis treatment. Journal of Renal Care, 43(2), 73-82.

Schouten, R. W., Haverkamp, G. L., Loosman, W. L., Chandie Shaw, P. K., van Ittersum, F. J., Smets, Y. F., ... & Siegert, C. E. (2019). Anxiety symptoms, mortality, and hospitalization in patients receiving maintenance dialysis: a cohort study. American Journal of Kidney Diseases, 74(2), 158-166.

Sheng, K., Zhang, P., Chen, L., Cheng, J., Wu, C., & Chen, J. (2014). Intradialytic exercise in hemodialysis patients: A systematic review and meta-analysis. American Journal of Nephrology, 40(5), 478–490.

Shirazian, S., Smaldone, A., Rao, M. K., Silberzweig, J., Jacobson, A. M., Fazzari, M., & Weinger, K. (2018). A protocol for a pilot randomized controlled trial to assess the feasibility and effect of a cognitive behavioral intervention on quality of life for patients on hemodialysis. Contemporary Clinical Trials, 73, 51-60.

Tao, X., Chow, S. K., & Wong, F. K. (2014). Determining the validity and reliability of the Chinese version of the Kidney Disease Quality of Life Questionnaire (KDQOL-36). BMC Nephrology, 15(1), 115.

Theofilou, P. (2013). Quality of life: Definition and measurement. Europe's Journal of Psychology, 7(1), 150–162.

van Zuilen, A. D., Bots, M. L., Dulger, A., van der Tweel, I., van Buren, M., Ten Dam, M. A., ... & Wetzels, J. F. (2012). Multifactorial intervention with nurse practitioners does not change cardiovascular outcomes in patients with chronic kidney disease. Kidney International, 82(6), 710-717.

Wang, F., Yang, C., Long, J., Zhao, X., Dong, Z., Ding, X., ... & CKNET: The China Kidney Disease Network. (2019). Executive summary for the 2015 Annual Data Report of the China Kidney Disease Network (CK-NET). Kidney International, 95(3), 501-505.

Wang, K. M. (2018). The effect of cognitive behavioral nursing intervention on renal function and quality of life in patients with chronic renal failure undergoing hemodialysis. Electronic Journal of Clinical Medical Literature, 46, 97-102.

Wu, X. Y., Bai, Y., Li, Y. J., Wei, X. Y., & Wang, J. (2017). Effect of cognitive behavioral nursing intervention on renal function and quality of life in patients with chronic renal failure undergoing hemodialysis. Hainan Medicine, 6, 1023-1025.

Xing, L., Chen, R., Diao, Y., Qian, J., You, C., & Jiang, X. (2016). Do psychological interventions reduce depression in hemodialysis patients?: A meta-analysis of randomized controlled trials following PRISMA. *Medicine*, *95*(34), e4675.
Zhang, L., Long, J., Jiang, W., Shi, Y., He, X., Zhou, Z., ... & Wang, H. (2016). Trends in chronic kidney disease in China. New England Journal of Medicine, 375(9), 905-906.
Zhang, L., Wang, F., Wang, L., Wang, W., Liu, B., Liu, J., ... & Wang, H. (2012). Prevalence of chronic kidney disease in China: a cross-sectional survey. The Lancet, 379(9818), 815-822.
Zhou, G. F. (2018). The influence of cognitive behavioral nursing intervention on renal function, anxiety and depression and quality of life in patients with chronic renal failure undergoing hemodialysis. China Modern Medicine, 35, 203-205.
Zung, W. W. (1965). A self-rating depression scale. Archives of General Psychiatry, 12(1), 63-70.
Zung, W. W. (1971). A rating instrument for anxiety disorders. Psychosomatics, 12(6), 371-379.