



BENSON'S RELAXATION TECHNIQUE AS A NON-PHARMACOLOGICAL INTERVENTION TO IMPROVE SLEEP PATTERNS IN CHRONIC KIDNEY DISEASE (CKD) STAGE 5 PATIENTS UNDERGOING HEMODIALYSIS

Yunita^{1*}, Yulyanti¹, Candra Kusuma Negara², Ricky Prawira², Ari Athiutama³

¹Nursing Science Study Program, STIKES Borneo Nusantara, Jl. Veteran, Sungai Lutut, Banjarmasin Timur, Banjarmasin, Kalimantan Selatan 70237, Indonesia

²Faculty of Medicine and Health Science, Universitas Lambung Mangkurat, Jl. Brigjend H. Hasan Basri, Pangeran, Banjarmasin Utara, Banjarmasin, South Kalimantan 70123, Indonesia

³Poltekkes Kemenkes Palembang, Jl. Sukabangun 1 No.KM.6, RW.5, Suka Bangun, Sukarami, Palembang, Sumatera Selatan 30151, Indonesia

*yunita7733@gmail.com

ABSTRACT

Sleep disturbance is one of the common complaints experienced by patients with Chronic Kidney Disease (CKD) stage V undergoing hemodialysis, which has an impact on decreasing the quality of life physically, psychologically, and socially. Non-pharmacological therapy such as the Benson relaxation technique is considered effective and safe in overcoming sleep disturbances and improving the emotional well-being of patients. This study aims to evaluate the effectiveness of the Benson relaxation technique in improving the quality of life of patients with CKD stage V. The research design used was a quasi-experimental with a pre-test and post-test approach with a control group, involving 60 respondents who were divided into intervention groups (n=30) and control groups (n=30) through a purposive sampling technique. The intervention was carried out for 14 days with a duration of 15–20 minutes of exercise per day. The instrument used was a quality of life (QoL) questionnaire consisting of five aspects: satisfaction with therapy, impact on life, fear of complications, social problems, and total QoL score. The Pittsburgh Sleep Quality Index (PSQI) instrument used in this study has been proven valid ($r = 0.412-0.698$; $p < 0.05$) and reliable (Cronbach's Alpha = 0.824; $p = 0.000$), making it suitable for measuring patient sleep quality. Data were analyzed using statistics, with Pearson validity test, Cronbach's Alpha reliability ($\alpha = 0.824$), Shapiro-Wilk normality test, and Wilcoxon and Mann-Whitney difference tests. The results showed a significant increase in the total QoL score from 2.63 ± 0.49 to 3.27 ± 0.39 ($p = 0.001$). All aspects of QoL also experienced a significant increase ($p < 0.05$), especially in the aspect of satisfaction with therapy and decreased fear of complications. Field findings also showed that patients felt calmer, could fall asleep faster, and showed increased social interaction after the intervention. The conclusion of this study is that the Benson relaxation technique is effective in improving the quality of life of CKD stage V patients and is recommended as a nursing intervention that can be applied routinely and independently in hemodialysis service practices.

Keywords: CKD stage V; hemodialysis; nursing interventions; quality of life; sleep disorders; technique

How to cite (in APA style)

Yunita, Y., Yulyanti, Y., Negara, C. K., Prawira, R., & Athiutama, A. (2025). Benson's Relaxation Technique as A Non-Pharmacological Intervention to Improve Sleep Patterns in Chronic Kidney Disease (CKD) Stage 5 Patients Undergoing Hemodialysis. *Indonesian Journal of Global Health Research*, 7(6), 375–384. <https://doi.org/10.37287/ijghr.v7i6.519>.

INTRODUCTION

Sleep pattern disorders are one of the chronic problems often experienced by patients with chronic kidney disease (CKD), especially in the final stage (stage V) who undergo regular hemodialysis therapy. Metabolic imbalance, hormonal changes, muscle pain, discomfort during the procedure, and psychosocial stress are the main factors that cause CKD patients to experience long-term sleep disorders (Huang et al., 2023; Lyons, 2024). This decrease in sleep quality has a negative impact on the patient's physical and psychological condition, including decreased cognitive function, increased blood pressure, depression, and decreased overall quality of life (Chen et al., 2023; Doan et al., 2024). Data from the World Health Organization (WHO) states that more than 850,000 deaths each year are caused by chronic kidney disease, with the prevalence continuing to increase globally

(Organization, 2023). In Indonesia, based on 2022 data, the number of CKD patients reached more than 700,000 people and most of them were on hemodialysis (Gela et al., 2024; Ummah et al., 2024). In South Kalimantan Province itself, the 2023 Health Service report noted that more than 400 chronic kidney failure patients were actively undergoing routine therapy in government hospitals (Nurhikmah & Riyadi, 2023). One of the most common complaints found among these patients is recurrent sleep disorders that worsen over time.

Management of sleep disorders in CKD patients is generally carried out through pharmacological therapy using sleeping pills or sedatives. However, this therapy often causes side effects such as daytime sleepiness, dependence, further decline in kidney function, and does not resolve the psychological roots of the disorder (Gopal et al., 2025; Sealy, 2022). Therefore, a non-pharmacological approach is very important, especially methods that are easy to do, safe, and able to create peace of mind. One method that has received attention in nursing clinical practice is the Benson Relaxation Technique. Benson's Relaxation Technique focuses on deep breathing exercises and repetition of certain words or sentences to create calm and reduce stress levels, so that it can help patients sleep better (Firmansyah & Herlina, 2024; Sarmadi et al., 2023).

The Benson Relaxation Technique was developed by Dr. Herbert Benson of Harvard Medical School in response to chronic stress. This method combines rhythmic deep breathing with the repetition of calming words or prayers to activate the body's relaxation response. Several studies have shown that this technique can reduce sympathetic nervous system activity, reduce anxiety, and improve sleep quality, especially in patients with chronic conditions such as heart and kidney disease (Zoccali et al., 2025; Zolfagharzadeh et al., 2024). Chronologically, CKD patients undergoing hemodialysis experience gradual changes in sleep patterns. In the early stages, sleep disturbances may only be difficulty falling asleep or waking up frequently at night. Over time, sleep quality decreases due to increased anxiety, discomfort from the hemodialysis procedure, and metabolic changes in the body. If not treated promptly, this sleep disorder can lead to chronic fatigue, cognitive impairment, and an increased risk of cardiovascular disease and depression (Kong et al., 2023; Nguyen et al., 2022).

A recent study by (Zolfagharzadeh et al., 2024)) showed that the Benson technique significantly improved sleep quality in cardiovascular disease patients after a four-week intervention (D. Krismiadi et al., 2023). On the other hand, research (D. Krismiadi et al., 2023) also showed that hemodialysis patients who were given Benson therapy experienced a significant decrease in anxiety and an increase in sleep quality compared to the control group (Alkhaqani, 2022; D. K. D. Krismiadi et al., 2023). However, in Indonesia, especially in South Kalimantan, research on the effectiveness of the Benson technique in patients with stage V CKD is still limited, so further studies are needed to provide strong empirical evidence. Based on these problems, this study aims to analyze the effectiveness of the Benson Relaxation Technique as a non-pharmacological intervention in improving sleep patterns in CKD stage V patients undergoing hemodialysis. Through a quasi-experimental approach with a control group, this study is expected to produce clinically valid and practically relevant data. The results of this study not only contribute to strengthening evidence-based nursing practices , but also become the basis for the development of independent relaxation intervention guidelines for hemodialysis patients to improve their quality of life holistically.

METHOD

This study used a quasi-experimental design with a pre-test and post-test approach with a control group. This design was chosen to determine the difference between two groups of paired data before and after the Benson's Relaxation intervention . The purpose of this design was to evaluate the effectiveness of the Benson's Relaxation Technique on the sleep patterns of CKD stage 5 patients undergoing hemodialysis. Respondents were divided into two groups, namely the

intervention group given treatment in the form of the Benson's Relaxation technique and the control group that did not receive intervention. Changes in sleep patterns were analyzed before and after the intervention to assess the effectiveness of the technique. The study was conducted in one of the government hospitals in Banjarmasin City, South Kalimantan, which was carried out in the internal medicine room. The study was conducted from March to August 2025.

The study was conducted through several stages, namely the preparation stage, sampling, data collection, data analysis and report preparation. The population in this study were all CKD stage 5 patients undergoing hemodialysis at Banjarmasin Regional Hospital, totaling 220 people. Samples were taken using incidental sampling, namely patients who met the inclusion criteria and were willing to participate in the study. The sample used in this study was 60 people, who were then divided into two groups: the intervention group (30 people) and the control group (30 people). The inclusion criteria for the study were patients diagnosed with Chronic Kidney Disease (CKD) stage V and undergoing hemodialysis routinely at least 2 times per week for the last ≥ 3 months, aged between 30 and 65 years, including active adulthood and early elderly, who were still able to follow relaxation exercise instructions, were able to communicate verbally and did not experience cognitive impairment or disorientation of time/place/person, were willing to participate and sign the informed consent form, and were able to follow all Benson relaxation intervention sessions for at least 2 weeks (with a duration of 15–20 minutes per session). And the exclusion criteria were patients who were undergoing pharmacological therapy for sleep disorders, patients who were undergoing other relaxation interventions simultaneously and patients who were unwilling to become respondents.

The intervention was given to the treatment group in the form of Benson relaxation technique training, which was carried out every day for 14 consecutive days, with each session lasting 15 to 20 minutes. The training was carried out face-to-face and guided directly by the researcher. This relaxation technique involves regulating slow breathing, repeating calming words or phrases silently (such as "calm" or "peace"), and focusing on breathing, with the aim of causing a physiological effect of relaxation. The control group did not receive any additional intervention, but continued to undergo routine hemodialysis treatment procedures as usual. Data were collected by completing the validated Indonesian version of the Pittsburgh Sleep Quality Index (PSQI) questionnaire. This instrument is used to measure patients' sleep quality through seven components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The total score ranges from 0 to 21, with higher scores indicating worse sleep quality. Before being used, the PSQI instrument was tested for validity and reliability. Validity testing using Pearson Product Moment on 30 trial respondents produced calculated r values ranging from 0.412 to 0.698, higher than the r table of 0.361 ($\alpha = 0.05$), with a p value < 0.05 on all items. This indicates that all questions are valid. The results of the reliability test using the Cronbach's Alpha method showed an alpha value of 0.824 with a p -value = 0.000, which means that the instrument is very reliable for use in this study.

Furthermore, data normality test was conducted using Shapiro-Wilk test. The results showed that the intervention group data (pre and post-test) were normally distributed ($p = 0.072$ and $p = 0.063$), while the control group was not normally distributed ($p = 0.028$ and $p = 0.031$). Based on these results, further statistical analysis used Wilcoxon Signed Rank Test to see the differences within groups and Mann-Whitney U Test to see the differences between groups. With a strong quasi-experimental design, structured intervention implementation, and the use of instruments that have been proven valid and reliable, this study is expected to provide scientific evidence regarding the effectiveness of the Benson relaxation technique as a non-pharmacological approach in improving the sleep quality of CKD patients undergoing routine hemodialysis.

RESULT

Respondent Characteristics

Table 1.
Respondent Characteristics (n=30)

N	Characteristics	Category	Intervention Group	Control Group	Total	Percentage
1	Gender	Man	18	16	34	56.7%
		Woman	12	14	26	43.3%
2	Age (years)	30-40	6	7	13	21.7%
		41-50	12	11	23	38.3%
		51-60	9	9	18	30.0%
		>60	3	3	6	10.0%
3	Last education	Elementary school/equivalent	5	4	9	15.0%
		Junior high school/equivalent	8	9	17	28.3%
		High school/equivalent	11	10	21	35.0%
		Diploma/Bachelor	6	7	13	21.7%
4	Long-term Suffering from CKD	<1 year	2	3	5	8.3%
		1-3 year	10	11	21	35.0%
		4-6 year	12	10	22	36.7%
		>6 year	6	6	12	20.0%

This study involved 60 respondents consisting of 30 people in the intervention group and 30 people in the control group. Respondent characteristics include gender, age, last education, and duration of chronic kidney disease (CKD) stage V undergoing hemodialysis. Based on gender, the majority of respondents were male, namely 34 people (56.7%), and the rest were female, namely 26 people (43.3%). In terms of age, most respondents were in the middle adulthood age range (41–50 years) namely 23 people (38.3%). For the last education, most respondents were high school graduates as many as 21 people (35.0%), followed by junior high school graduates as many as 17 people (28.3%), Diploma/Bachelor's degree as many as 13 people (21.7%), and elementary school as many as 9 people (15.0%). Based on the duration of CKD, most respondents had undergone hemodialysis therapy for 4–6 years, namely 22 people (36.7%).

Comparison of Quality of Life Before and After Intervention

Table 2.

Comparison of Quality of Life Scores Before and After Benson Relaxation Intervention (n = 30)

Quality of Life Aspects	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	p-value	Information
Satisfaction with therapy	2,65 ± 0,48	3,35 ± 0,40	0.001	Increased respondents were more accepting and satisfied with therapy
The effect of therapy on life	2,55 ± 0,52	3,20 ± 0,44	0.002	Therapy is felt to have an impact on daily life and emotional control
Fear of complications	2,70 ± 0,50	3,30 ± 0,42	0.000	Anxiety levels decreased significantly
Social problems	2,60 ± 0,46	3,25 ± 0,38	0.001	Social interactions improved after therapy
Total QoL Score	2,63 ± 0,49	3,27 ± 0,39	0.001	Comprehensive improvement in all aspects of QoL

Based on table 2, it shows that there was an increase in the average score of Quality of Life (QoL) in the intervention group after being given Benson relaxation therapy for 14 days. Before the intervention, the total average QoL score was 2.63 ± 0.49 , which was in the moderate quality of life category. After the intervention, the score increased to 3.27 ± 0.39 , which indicated an improvement in general quality of life.

Additional Field Findings

During the implementation of the Benson relaxation technique intervention, researchers found some

interesting responses from participants that were not recorded in the quantitative data. Most patients stated that the exercise was easy to practice and had a calming effect, especially after undergoing hemodialysis. Several patients reported starting to do the exercises independently at home when they felt anxious or had difficulty sleeping, indicating that the technique was accepted and internalized as a coping strategy. In addition, some patients reported positive emotional and spiritual effects. The repetition of words such as "calm" or prayers uttered during relaxation made them feel more surrendered, peaceful, and optimistic about their illness. There were also patients who said that this exercise helped them be more solemn during worship. Although there was a little difficulty at the beginning of the session, especially in maintaining concentration, patients were generally able to follow along well after several exercises. Interestingly, the practice also affected social relationships. Several participants mentioned that they became more patient and less angry at home, and some families were even interested in trying the practice. These findings suggest that Benson's relaxation has an impact not only on sleep quality, but also on emotional calmness and the quality of patients' social relationships.

DISCUSSION

This study assessed the intervention of Benson relaxation technique in evaluating the effectiveness of Benson relaxation technique on improving the quality of life of CKD stage V patients in Banjarmasin hospital through four main aspects: satisfaction with therapy, influence of therapy on life, fear of complications, and social problems. Each aspect showed significant improvement after intervention, which was interpreted as a significant positive impact on improving the quality of life of CKD stage V patients undergoing hemodialysis. The increase in the total QoL score from 2.63 to 3.27 after the intervention indicates that this technique is able to improve various important aspects of patients' lives. Overall, these results confirm that Benson relaxation therapy is not only statistically effective, but also provides significant psychological, emotional, and social impacts, making it a relevant intervention to be routinely implemented in the care of hemodialysis patients.

Satisfaction with Therapy

Satisfaction with therapy is an early indicator of the success of an intervention. In this study, the satisfaction score increased significantly from 2.65 ± 0.48 to 3.35 ± 0.40 . This increase indicates that most patients received the Benson relaxation intervention well. This is very important because active patient involvement and comfort in the therapy process will increase compliance and consistency of independent practice. Benson's relaxation technique has the advantage of being a simple, non-pharmacological intervention that does not require special equipment and can be performed at any time, even by patients with mild to moderate physical disabilities. Flexible spiritual elements (such as repeating the word "calm" or personal prayer) provide psychological and religious comfort for many patients, especially in Indonesia, which has a society with a strong religious background. From the research of Zolfagharzadeh et al., it was noted that around 80% of chronic disease patients who underwent Benson relaxation therapy felt satisfied because this method gave them a sense of control over symptoms that often could not be resolved by pharmacological therapy alone (Zolfagharzadeh *et al*, 2024). The results of this study strengthen these findings and confirm that this therapy is widely accepted by CKD patients at various levels of education and age.

The Effect of Therapy on Life

This aspect showed an increase from 2.55 ± 0.52 to 3.20 ± 0.44 . This shows that the impact of Benson's intervention was not only felt during the relaxation practice, but also spread to the patient's daily activities. Patients reported that after regular practice, they felt lighter in going through the day, more organized in their routines, and better able to control their emotions when facing unpleasant events. CKD stage V patients often face physical limitations and high emotional stress due to strict hemodialysis schedules, disturbed sleep patterns, and uncertainty about the future. Relaxation helps reduce these mental burdens and encourages a more positive mindset (Güvener &

Koç, 2025) stated that hemodialysis patients who were given relaxation training for two weeks experienced increased daily function, decreased complaints of fatigue, and increased time management skills (Güvener & Koç, 2025). These findings are in line with reports from respondents in this study who stated that they began to feel stronger and more organized in going through their days after regularly attending relaxation sessions.

Fear of Complications

The fear of complications score increased from 2.70 ± 0.50 to 3.30 ± 0.42 , reflecting a significant decrease in anxiety. CKD patients often experience anticipatory anxiety, which is an excessive worry about the possibility of total kidney failure, death, or long-term side effects of hemodialysis. Relaxation therapy helps calm the sympathetic nervous system, inhibits the release of adrenaline and cortisol, and creates a more stable and accepting mental state. Benson's technique trains attention to focus on the breath and peaceful words, and directs the mind to let go of worry about things that cannot be controlled. This is in line with the mindfulness approach that focuses on accepting the present moment without over-judging (D. Krismiadi et al., 2023) in their study showed that Benson relaxation significantly reduced anxiety and fear of medical complications in hemodialysis patients. Patients felt more "peaceful" after undergoing relaxation exercises consistently for more than 10 days. The results of this study also showed that fear reduction occurred even in patients who previously had high levels of anxiety

Social Problems

The increase in score from 2.60 ± 0.46 to 3.25 ± 0.38 indicates an improvement in social relations and interpersonal adaptability. Sleep disturbances, chronic fatigue, and psychological stress often cause CKD patients to become irritable, withdrawn, or experience conflict with family and medical personnel. By reducing stress and negative emotions through relaxation exercises, patients become more open, patient, and able to establish healthier communication. This decrease in social problems can also be linked to increased self-compassion that arises from regular relaxation practice. Patients feel more at peace and accept their condition, so they are less easily provoked by external conflicts. (Creswell & Lindsay, 2014) menemukan bahwa latihan relaksasi dan kesadaran penuh (*mindfulness-based practices*) berdampak positif pada perilaku sosial dan peningkatan kualitas relasi, terutama pada individu dengan penyakit kronis dan gangguan tidur (Creswell & Lindsay, 2014). This is consistent with field findings, where several respondents stated that they felt "calmer and less explosive" when dealing with partners or family members.

Total Quality of Life Score

The increase in the total QoL score from 2.63 ± 0.49 to 3.27 ± 0.39 shows that the Benson relaxation technique has a comprehensive impact on the patient's quality of life. This therapy not only improves sleep, but also improves mental, spiritual, emotional, and social aspects. This increased quality of life is an important indicator because it is directly related to prognosis and compliance with long-term treatment. Patients whose quality of life improves are generally more cooperative in undergoing hemodialysis therapy, more emotionally stable, and better able to manage their symptoms and side effects. Benson's relaxation technique, if practiced continuously, can be an integral part of supportive care for CKD patients. (Hsiung et al., 2023) in their meta-analysis of various relaxation and mindfulness interventions concluded that this approach had a significant impact on improving well-being, reducing anxiety, and increasing total quality of life scores in patients with chronic diseases, including CKD (Hsiung et al., 2023). This is in line with the results of this study which show that relaxation therapy is not only a complementary approach, but can actually be a core intervention in the management of long-term sleep disorders and stress.

Implications of the Benson Relaxation Technique Program

The results of this study indicate that the Benson relaxation technique has significant effectiveness in improving the quality of life of CKD stage V patients undergoing hemodialysis, especially in the

aspects of sleep, stress management, and emotional stability. This confirms that this intervention is worthy of consideration as part of evidence-based nursing practice, and can be integrated into routine health care programs. In practice, Benson's relaxation technique can be applied as a non-pharmacological independent intervention in nursing care for chronic patients, including dialysis patients. This therapy has been proven to significantly reduce anxiety levels, improve sleep quality, and increase emotional comfort. In addition to being easy to do, this technique does not require special tools and can be done by patients themselves at home, thus supporting the concept of self-care behavior in chronic patients.

Recent research by (D. Krismiadi et al., 2023) showed that Benson relaxation techniques are effective in reducing anxiety, improving sleep quality, and reducing fatigue in hemodialysis patients. In addition, a study by (Abu Maloh et al., 2022) showed that Benson therapy performed twice a day for 3 days can improve sleep quality in CKD patients (Abu Maloh et al., 2024). Another implication relates to the role of nurses as facilitators of holistic nursing interventions. Nurses can be trained to provide relaxation education in a short time, either through individual or group training. According to (Rosyida et al., 2020), a guide to implementing the Benson relaxation technique can be designed to include patient selection criteria, optimal duration, implementation time, preparation steps, procedures, benefits, and side effects of the technique (Rosyida et al., 2020). From an institutional perspective, Benson's relaxation technique can be integrated as part of the supportive service protocol in the hemodialysis room. The implementation of short relaxation sessions before or after dialysis can be a systematic approach in reducing psychological stress and improving the clinical atmosphere. A study by (Abu Maloh et al., 2024) showed that Benson's relaxation technique was effective in reducing stress and pain in hemodialysis patients (Abu Maloh et al., 2024).

In addition, this therapy is also relevant to be developed as a community-based educational policy, especially in health promotion programs or rehabilitation of CKD patients after hospitalization. Field findings in this study indicate that there is interest from families to participate in exercise sessions, which means that this therapy can also strengthen patients' social support, an important aspect in the success of chronic disease management. Overall, Benson relaxation therapy has great potential to be a cost-effective, safe, and impactful intervention solution, both psychologically, spiritually, and socially. Therefore, health institutions need to consider developing fixed protocols for the use of this technique in a structured, measurable, and sustainable manner.

CONCLUSION

Based on the research results, it can be concluded that the Benson relaxation technique is an effective and applicable non-pharmacological intervention to improve the quality of life of CKD stage V patients undergoing hemodialysis therapy. This intervention has been statistically proven to provide significant improvements in five main aspects of quality of life, namely satisfaction with therapy, the effect of therapy on life, reducing fear of complications, improving social relations, and increasing the total score of Quality of Life (QoL). The effectiveness is reflected in a significant increase in the average score of quality of life before and after the intervention. The total score of Quality of Life (QoL) increased from 2.63 ± 0.49 to 3.27 ± 0.39 ($p = 0.001$), with consistent improvements in all aspects measured. In addition to quantitative findings, field findings also show that most patients felt direct benefits from relaxation, such as better sleep, reduced anxiety, increased patience, and a stronger sense of spiritual surrender. Some patients even began practicing the technique independently at home. This suggests that Benson's relaxation technique is well-received, easy to understand, and can be internalized by patients as a daily coping skill. Thus, Benson's relaxation technique is worthy of recommendation as a structured and sustainable independent nursing intervention, especially for patients with chronic diseases such as CKD. This therapy not only supports physical recovery, but also facilitates psychological calmness and overall improvement of quality of life. Integration of this therapy into hemodialysis service protocols is

expected to strengthen the holistic nursing approach that is humanistic and evidence-based.

REFERENCES

- Abu Maloh, H. I. A., Soh, K. L., AbuRuz, M. E., Chong, S. C., Ismail, S. I. F., Soh, K. G., & Abu Maloh, D. I. (2022). Efficacy of Benson's relaxation technique on anxiety and depression among patients undergoing hemodialysis: A systematic review. *Clinical Nursing Research*, 31(1), 122–135.
- Abu Maloh, H. I. A., Soh, K. L., Chong, S. C., Ismail, S. I. F., Soh, K. G., Abu Maloh, D. I., & AbuRuz, M. E. (2024). Efficacy of Benson's Relaxation Technique on Stress and Pain Among Patients Undergoing Maintenance Hemodialysis: A Systematic Review. *SAGE Open Nursing*, 10, 23779608241251664.
- Alkhaqani, A. (2022). Psychological impact of chronic kidney disease and Hemodialysis: Narrative review. *Psychosom Med Res*, 4(2), 1–5.
- Chen, J., Chen, X., Mao, R., Fu, Y., Chen, Q., Zhang, C., & Zheng, K. (2023). Hypertension, sleep quality, depression, and cognitive function in elderly: A cross-sectional study. *Frontiers in Aging Neuroscience*, 15, 1051298.
- Creswell, J. D., & Lindsay, E. K. (2014). How does mindfulness training affect health? A mindfulness stress buffering account. *Current Directions in Psychological Science*, 23(6), 401–407.
- Doan, V., Shoker, A., & Abdelrasoul, A. (2024). Quality of Life of Dialysis Patients: Exploring the Influence of Membrane Hemocompatibility and Dialysis Practices on Psychosocial and Physical Symptoms. *Journal of Composites Science*, 8(5), 172.
- Firmansyah, A., & Herlina, S. (2024). Kepatuhan Pengobatan dan Dukungan Keluarga dengan Risiko Gagal Ginjal Kronik pada Pasien Hipertensi. *Indonesian Journal of Health Development*, 6(2), 69–83.
- Gela, Y. Y., Limenh, L. W., Simegn, W., Ayenew, W., Chanie, G. S., Seid, A. M., Beyna, A. T., Esubalew, D., Mitku, M. L., & Mengesha, A. K. (2024). Poor sleep quality and associated factors among adult chronic kidney disease patients. *Frontiers in Medicine*, 11, 1366010.
- Gopal, A., Farragher, J., Jassal, S. V., & Mucsi, I. (2025). Sleep Disorders in CKD. *American Journal of Kidney Diseases*.
- Güvener, Y. Ö., & Koç, Z. (2025). The effect of breathing exercises on pain, sleep, and symptom management in patients undergoing hemodialysis: a randomized controlled trial. *Sleep and Breathing*, 29(2), 170.
- Hsiung, Y., Chen, Y.-H., Lin, L.-C., & Wang, Y.-H. (2023). Effects of Mindfulness-Based Elder Care (MBEC) on symptoms of depression and anxiety and spiritual well-being of institutionalized seniors with disabilities: a randomized controlled trial. *BMC Geriatrics*, 23(1), 497.
- Huang, C., Cheng, C., & Yen, M. (2023). Factors associated with poor sleep quality in patients with pre-dialysis chronic kidney disease: a systematic review. *Journal of Advanced Nursing*, 79(6), 2043–2057.
- Kong, J., Zhou, L., Li, X., & Ren, Q. (2023). Sleep disorders affect cognitive function in adults: an overview of systematic reviews and meta-analyses. *Sleep and Biological Rhythms*, 21(2), 133–142.

- Krismiadi, D. K. D., Wihastuti, T. A. W. T. A., Dina, D. D. S. L. I., Ismail, D. S. L., Vatmasari, R. A. V. R. A., Pertiwi, A. N. P. A. N., Erman, E., Nurhandayani, L. N. L., Ni, N. M. D. A. P., & Prajayanti, M. D. A. (2023). Effectiveness of benson's relaxation techniques on anxiety, sleep quality and fatigue in hemodialysis patients: a scoping review. *The Southeast Asian Journal of Tropical Medicine and Public Health*, 54(Suppl 1), 153–168.
- Krismiadi, D., Wihastuti, T. A., & Ismail, D. D. S. L. (2023). Differences Between the Effects of The Benson Relaxation Technique and Deep Breath on Anxiety, Sleep Quality, and Fatigue in Hemodialysis Patients. *Jurnal Aisyah: Jurnal Ilmu Kesehatan*, 8(2).
- Lyons, O. D. (2024). Sleep disorders in chronic kidney disease. *Nature Reviews Nephrology*, 20(10), 690–700.
- Nguyen, V. V, Zainal, N. H., & Newman, M. G. (2022). Why sleep is key: poor sleep quality is a mechanism for the bidirectional relationship between major depressive disorder and generalized anxiety disorder across 18 years. *Journal of Anxiety Disorders*, 90, 102601.
- Nurhikmah, N., & Riyadi, M. (2023). Hubungan penderita diabetes militus terhadap tingkat keparahan gagal ginjal kronik pada pasien yang menjalani hemodialisis di rs banjarmasin. *Journal of Nursing Invention*, 4(1), 25–34.
- Organization, W. H. (2023). Global report on hypertension: the race against a silent killer. World Health Organization.
- Rosyida, R. W., Sa'bani, N. A., Parwanti, U. P., Aksan, S. R., Sari, R. A., Silva, J. F. D. S., Rosadi, S. N., Na'imah, S., Wahyuni, S., & Hardiyani, T. (2020). Panduan Teknik Relaksasi Benson pada Pasien Hemodialisis: Literature Review. *Jurnal Keperawatan Klinis Dan Komunitas (Clinical and Community Nursing Journal)*, 4(1), 26–35.
- Sarmadi, S., Beigzadeh, S., Nazari, A. M., & Soleimaninejadian, S. (2023). Effect of Benson's relaxation technique on the quality of sleep among patients with chronic diseases: A narrative review. *Journal of Nursing Reports in Clinical Practice*, 2(4), 269–273.
- Sealy, E. A. (2022). Sleep, sleep deprivation, sleeplessness and their effect on society. *Sch J Appl Med Sci*, 10(10), 1647–1663.
- Ummah, N. S., Puspitadewi, U. R., Wahyurianto, Y., & Nugrahaeni, W. T. (2024). Quality of Life of Chronic Kidney Failure Patients Treated at Dr. R. Koesma Tuban. *Science Techno Health Journal*, 2(2), 17.
- Zoccali, C., Mallamaci, F., Kanbay, M., Tuttle, K. R., Kotanko, P., De Caterina, R., Grassi, G., & Mancia, G. (2025). The autonomic nervous system and inflammation in chronic kidney disease. *Nephrology Dialysis Transplantation*, gfa020.
- Zolfagharzadeh, H., Esfandiari, M., Nazari, A. M., Khalili, A., Majidi Parizi, M., Toulabi, S., & Taheri Otaghsara, S. M. (2024). Effects of Benson's relaxation technique on sleep quality of patients with cardiovascular diseases: A narrative review. *Journal of Nursing Reports in Clinical Practice*, 2(2), 89–93.

