



## Evaluation of the Sleep Pattern in Patients Undergoing Hemodialysis

Amer Muhasin Nasir<sup>1</sup>, Alaa Jawad Kadhim<sup>2</sup>

<sup>1</sup>University of Baghdad, College of Nursing, Department of Adult Nursing, Baghdad, Iraq. Ph.D. Student. Work at Southern Technical University

<sup>2</sup>University of Baghdad, College of Nursing, Department of Adult Nursing, Baghdad, Iraq.

---

### Abstract

**Objective:** The purpose of this study is to evaluate the sleep Pattern in patients undergoing hemodialysis

**Methodology:** A research with a true experimental design, a randomized clinical trial, was developed and carried out beginning with The research was carried out in two hemodialysis units in the city of Al-Nasiriyah, namely the Al-Hussien teaching hospital and the Al-Nasiriyah teaching hospital, between the dates of February 20, 2024 and May 6, 2024. Following the calculation of the sample from the population, fifty patients were split into two groups: the study group, which consisted of twenty-five individuals, and the control group, which also consisted of twenty-five individuals. Relaxation Technique was used in the study group; both of these techniques had validity and reliability.

**Results:** The data results indicated that all 25 patients had poor sleep pattern in the pre-test. However, the post-test results for the application of the relaxation technique were statistically significant.

**Conclusions:** The study found a statistically significant difference in hemodialysis study group patients before and after application of relaxation technique. The research revealed that the use of Benson's relaxation technique resulted in a significant improvement in sleep pattern in patients undergoing hemodialysis.

**Recommendations:** In order to extend the results of the experiment to hemodialysis units in hospitals, the research suggests that the relaxation method be used in a trial setting to all patients who are undergoing hemodialysis.

**Keywords:** Relaxation, Sleep Pattern, Hemodialysis Unit.

---

### I. Introduction

In patients with end-stage renal illness, hemodialysis is the primary therapeutic option. There is a reduction in urea, creatinine, and fluids that are in excess. Half of all patients with renal failure are treated with hemodialysis(1)

Hemodialysis is the treatment of choice for around 70 percent of patients who have reached the end stage of renal failure (approximately 3 million people globally). Despite the fact that it is an effective way for prolonging life, hemodialysis therapy is not without limitations(2).

Associated with poor results (annually, a mortality rate of one in six individuals receiving the therapy), and it has a significant cost. (3). Hemodialysis patients often have the issue of insufficient sleep pattern. Studies reveal that more than 80% of persons with chronic renal insufficiency have sleep disturbances. The incidence of sleep disorders in these individuals is as follows: insomnia (69%), obstructive sleep apnea syndrome (24%), restless legs syndrome (18%), nightmares (13%), excessive daytime drowsiness (12%), somnambulism (4%), and narcolepsy (1%). The subjective evaluation of sleep pattern relies on psychological aspects, such as feeling refreshed upon waking up and being content with the whole sleep experience. <sup>(4)(5)</sup>. The prevalence of insomnia in patients with end-stage kidney disease (ESKD) on either conventional hemodialysis or chronic ambulatory peritoneal dialysis (CAPD) ranges from 19 to 71 percent. Insomnia significantly contributes to both psychological and bodily suffering, and is associated with an increased probability of death in afflicted persons<sup>(6)</sup>. To define a physiological and homeostatic condition that acts as a compensatory mechanism to offset the stress reaction. Various methods may be used to elicit the Relaxation Response, including visualization, muscular relaxation, energy healing, massage, acupuncture, various breathing techniques, meditation, prayer, and yoga. The relaxation response is marked by a decline in oxygen consumption and a decrease in activity of the sympathetic nervous system. <sup>(7)</sup>. To define a physiological and homeostatic condition that acts as a compensatory mechanism to offset the stress reaction. Various methods may be used to elicit the Relaxation Response, including visualization, muscular relaxation, energy healing, massage, acupuncture, various breathing techniques, meditation, prayer, and yoga. The relaxation response is marked by a decline in oxygen consumption and a decrease in activity of the sympathetic nervous system. <sup>(5)</sup>.

Herbert Benson devised the Benson relaxation method, which has gained significant popularity due to its simplicity in learning and ability to induce total muscle relaxation. The Benson relaxation technique is widely recognized as one of the most effective strategies for achieving muscular relaxation. It controls the hypothalamus, decreases sympathetic and parasympathetic signals, and has beneficial effects on respiration, heart rate, and workload. In addition, the mindfulness techniques included in this relaxation method may have an impact on several medical and psychological ailments, such as pain, tension, anxiety, despair, mood, and self-esteem. The Benson relaxation approach is effective for addressing sleep disorders in elderly individuals, hemodialysis patients, and pregnant women with hypertension. <sup>(8)</sup>.

## II. Methodology

A experimental design study for patients who undergo hemodialysis. It started from Between the dates of February 20, 2024 and May 6, 2024, study was done at two hemodialysis units in Al-Nasiriyah city (Al-Hussien teaching hospital and Al-Nasiriyah teaching hospital). A simple random sampling (probability) sampling technique that is non probability (purposive) of 50 patients undergo hemodialysis was selected to achieve the objective of the study.

The fifty patients were randomly divided into two groups after the sample was 25 patients. The data collection technique used was personal interviews by the researcher with the patient after finish the dialysis session. Then, the data was collected for the two groups (study and control) for the pre-test to measure the sleep pattern. After that, the Benson Relaxation Technique (BRT) were applied to patients sited as study group. The post-test was also conducted for the two groups.

The researcher distributed an informed consent sheet to all patients undergo hemodialysis in order to obtain their permission to participate in the study. In addition, they were informed that they could withdraw from the research, refuse to answer a specific question, or participate in the intervention at any time.

The study protocol was reviewed and approved by the Ethics Committee of Baghdad University of collage of nursing, Bagdad, Iraq

The intervention started with the HD patients being placed in separate rooms, reclining in bed, and assuming a supine position. Every patient had a 20-minute BRT treatment. The participants were directed to (1) adopt a relaxed position, (2) close their eyes, (3) systematically relax all their muscles starting from their feet and moving upwards, and (4) breathe in through their nostrils while concentrating on the sound of their breath, silently repeating the word 'one' to themselves when exhaling. This treatment had to be repeated for a period of 20 minutes. The patients were instructed to determine the time just by opening their eyes. However, the use of an alert was prohibited.

The researcher relies on the preliminary evaluation of patients' requirements to conduct the experiment, as well as the analysis of sleep pattern data from relevant scientific literature and prior studies to develop the intervention. The questionnaire is a checklist that is divided into two parts:

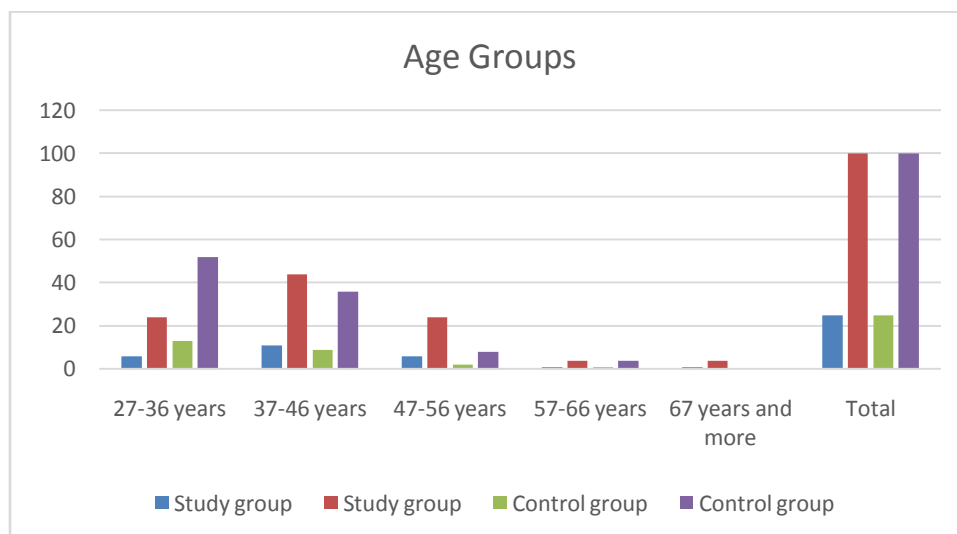
Part I: This section presents the sociodemographic data of the patients, which were obtained via interviews. The parameters include age, gender, educational level, and the duration of dialysis in months.

Part II: The Pittsburgh Sleep Pattern Index (PSQI) is a self-administered survey used to evaluate the general excellence of sleep and the degree of disruptions experienced over a span of one month. There are a total of nineteen unique criteria that contribute to the calculation of seven specific "component" scores. The scores are generated by assessing the subjective sleep pattern, sleep onset latency, sleep duration, sleep efficiency, sleep disruption frequency, sleep medication use, and daily impairment degree. The final score is calculated by summing together the seven components and may range from 0 to 21. A PSQI score equal to or more than 5 signifies substandard sleep pattern, whereas a PSQI score below 5 signifies exceptional sleep pattern.

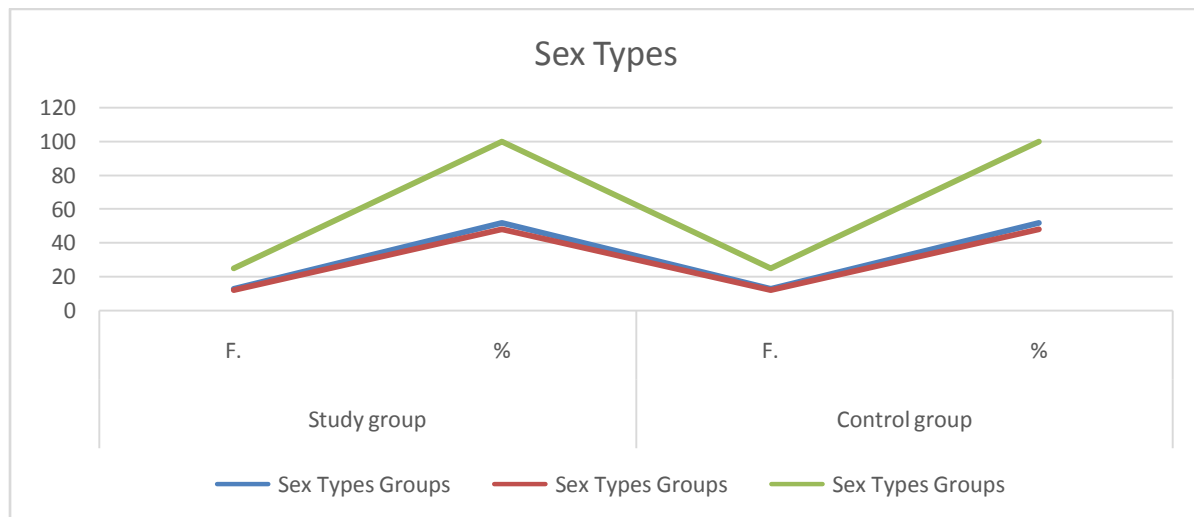
The researcher obtained the consent of all participants to record their responses and stored them for data analysis.

### III. Results

**Figure (1): The Distribution of the Study Samples (Study and Control Groups) According to the age Group (N=50).**



**Figure (1): The Distribution of the Study Samples (Study and Control Groups) According to the Sex Types Group (N=50).**

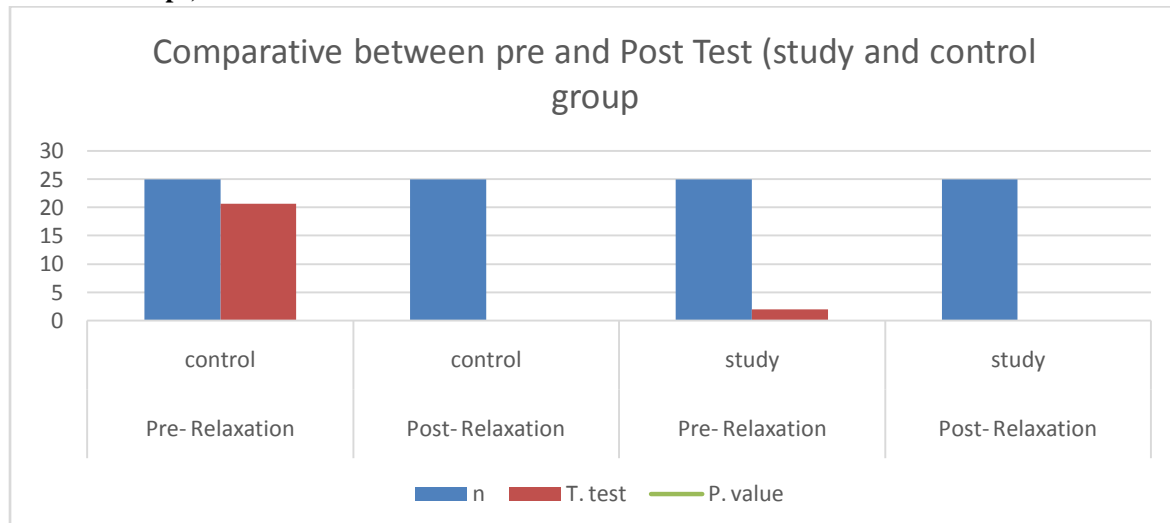


F (Frequency), % (percent).

Figure (1.) presented that mean age of the study group was 41.76years old while the mean age for the control group was 36.72years old.

Figure (2.) In relation to gender, the study group appears to have participants who are older, more educated, and have been on dialysis for a longer duration on average compared to the control group. These differences should be taken into account when interpreting any results from a study using these two groups.

**Figure (3): Comparative Between of Pre and Posttest Sleep Scores for the Study Sample (Study and Control Groups)**



N= number, M = mean of score, SD= standard deviation, NS =non-significant at  $P>0.05$ , S= significant at  $P<0.05$

Figure (3) The data in this table indicates that the Benson relaxation technique had a statistically significant impact on the study group when analyzed using a Paired t-test. Conversely, the control group did not exhibit any statistically significant differences between the pre- and post-tests when analyzed using a Paired t-test.

#### IV. Discussion

The findings of the present study have indicated that patients' demographic characteristics are shown in Table 1. presented that mean age of the study group was 41.76 years old while the mean age for the control group was 36.72 years old. In relation to gender, the study group appears to have participants who are older, more educated, and have been on dialysis for a longer duration on average compared to the control group. These differences should be taken into account when interpreting any results from a study using these two groups.

The result is supported by the study that done by(11)The research results indicated that only 26.0% of the entire study and control group were 67 years of age or older.

The findings of the current research align with a previous study done in Iraq(12), which indicated that the hemodialysis unit was primarily occupied by patients aged 48 and older, comprising 55.0% of the total.

The research sample was exclusively composed of males. The results of the present investigation are consistent with those of a study conducted in Iraq, which indicated that the majority of patients in the survey sample were male (63.3%)(13,14)

A minority of the patients (40.3% of the research sample) lack fundamental literacy skills, which means they are unable to read or write, in terms of their educational attainment. The results of the present investigation are consistent with previous research conducted in Iraq, which indicated that the majority of the study participants (35%) lacked reading and writing skills(15,16).

In terms of the duration of dialysis by month, the majority of patients undergo treatment for a period of 13 to 18 months. A study conducted in Iraq corroborated the results of the current research. (17), which indicated that the duration of dialysis per month varied from 11 to 20 months.

Table 2. The Benson relaxation technique had a statistically significant impact on the study group, as indicated by the table analysis. The Paired t-test revealed substantial disparities between the pre- and post-tests of the study group. Conversely, the Paired t-test did not reveal any statistically significant differences between the pre- and post-tests in the control group.

Before and after the Benson relaxation method was implemented, there was a substantial statistical difference in the pattern of sleep among hemodialysis patients, with a significance level of ( $p < 0.005$ ). The results of the present investigation were verified by (18-21)the research conducted in Irani, which revealed a significant discrepancy between the pre-test and post-test scores of the experimental group at a significance level of ( $P < 0.005$ ) (22).

## V. Conclusion:

The study discovered a statistically significant difference in the hemodialysis study group patients before and after the implementation of the relaxation technique. The research demonstrated that the implementation of Benson's relaxation technique (BRT) led to a substantial enhancement in the pattern of sleep among patients who were undergoing hemodialysis.

**Recommendations:** In order to generalize the experiment's findings to hemodialysis facilities in hospitals, the study suggests that the relaxation technique be applied to all patients who endure hemodialysis in the trial.

## References

- [1] Al-sodani MH, Rasheed JI, Dawood RA, Ghafour AS. Aortic Valve Calcification in Hemodialyzed Patients at the Iraqi Dialysis Center. 2015;14(3).
- [2] Alkhafaji MS, Al-Mayahi AM. Effectiveness of an Educational Program on Hemodialysis Patients' knowledge about Uremic Pruritus. Pakistan Heart Journal [Internet]. 2023 Jun 5 [cited 2024 Mar 21];56(2):397–406. Available from: <https://www.pkheartjournal.com/index.php/journal/article/view/1385>
- [3] Fadlalmola HA, Elkareem EMA. Impact of an educational program on knowledge and pattern of life among hemodialysis patients in Khartoum state. Int J AfrNurs Sci. 2020 Jan 1;12.
- [4] Lee R, Mastropasqua MG, Cheng AY, Wong LS. Uremic Pruritus: From Diagnosis to Treatment. Diagnostics 2022, Vol 12, Page 1108 [Internet]. 2022 Apr 28 [cited 2024 May 9];12(5):1108. Available from: <https://www.mdpi.com/2075-4418/12/5/1108/htm>

- [5] The Relationship between the Severity of Restless Legs Syndrome and Demographic Characteristics of Hemodialysis Patients | Iraqi National Journal of Nursing Specialties [Internet]. [cited 2024 May 10]. Available from: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/999>
- [6] Kadhim AJ, Mohammadi N, Hezbiyan Z, Abbasinia M, Norouzadeh R, Taghadosi M, et al. The effects of a mindfulness training intervention on fatigue and job satisfaction among emergency nurses: A quasi-experimental study. *Nurs Midwifery Stud* [Internet]. 2024 Feb 1 [cited 2024 May 9];13(1):9–17. Available from: [https://nmsjournal.kaums.ac.ir/article\\_190589.html](https://nmsjournal.kaums.ac.ir/article_190589.html)
- [7] Psychology Today. Dr. Herbert Benson's Relaxation Response | Psychology Today [Internet]. 2023 [cited 2023 Aug 9]. Available from: <https://www.psychologytoday.com/us/blog/heart-and-soul-healing/201303/dr-herbert-benson-s-relaxation-response>
- [8] Ibrahim A, Koyuncu G, Koyuncu N, Suzer NE, Cakir OD, Karcioglu O. The effect of Benson relaxation method on anxiety in the emergency care. *Medicine* [Internet]. 2019 May 1 [cited 2024 May 9];98(21). Available from: <https://pubmed.ncbi.nlm.nih.gov/3311274/>
- [9] Ellen S. 2012. 2012 [cited 2024 May 9]. Slovin's Formula Sampling Techniques | Sciencing. Available from: <https://sciencing.com/slovins-formula-sampling-techniques-5475547.html>
- [10] Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Pattern Index: a new instrument for psychiatric practice and research. *Psychiatry Res* [Internet]. 1989 [cited 2024 Mar 15];28(2):193–213. Available from: <https://pubmed.ncbi.nlm.nih.gov/2748771/>
- [11] Shinjar FJ, Bakey SJ, Khudur KM. Effectiveness of an education program on hemodialysis patients, knowledge towards dietary regimen at al-hussein teaching hospital in al-nasiriyha city. *Indian J Public Health Res Dev*. 2018 Oct 1;9(10):622–7.
- [12] Jassim Hussein M, Abbas Ahmed S. Effectiveness of an Educational Program on Patients' Knowledge Concerning care of Vascular Access of Hemodialysis in Al-Muthana Teaching Hospitals. *Iraqi National Journal of Nursing Specialties* [Internet]. 2020 Jun 30 [cited 2024 May 10];33(1):33–43. Available from: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/399>
- [13] Amer \*, Naser M, Mohammed WK. Effectiveness of Instructional Health Educational Vascular Access on Hemodialysis Patients' Knowledge at Al-Hussein Teaching Hospital in AL-Nasiriyah City. *Iraqi National Journal of Nursing Specialties* [Internet]. 2016 Jun 30 [cited 2024 Apr 23];29(1):86–94. Available from: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/245>
- [14] Kadhum IA, Mohammed WK. Nutritional status of adult hemodialysis patients in Al-Najaf Al-Ashraf Governorate. *Iraqi National Journal of Nursing Specialties* [Internet]. 2012 Jun 30 [cited 2024 May 10];25(1):64–78. Available from: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/119>
- [15] Hermis AH, Abed RI. Effectiveness of Self-Regulation Fluid Program on Patients with Hemodialysis Self-Efficacy for Fluid Adherence in Al-Diwaniyah Teaching Hospital. *Iraqi National Journal of Nursing Specialties* [Internet]. 2021 Jan 6 [cited 2024 May 10];34(2):74–88. Available from: <https://injns.uobaghdad.edu.iq/index.php/INJNS/article/view/577>
- [16] Worood A. Mahmood1 KMK. Effectiveness of an Educational Program on Nurses' Knowledge and Practices Concerning Nursing Management of patients' with Vascular Access in Dialysis Centers at Baghdad Teaching Hospitals. *Indian Journal of Forensic Medicine & Toxicology* [Internet]. 2020 Jul 30 [cited 2024 May 9];14(3):2604–8. Available from: <https://medicopublication.com/index.php/ijfnt/article/view/10830>
- [17] Rambod M, Pourali-Mohammadi N, Pasyar N, Rafii F, Sharif F. The effect of Benson's relaxation technique on the pattern of sleep of Iranian hemodialysis patients: A randomized trial. *Complement Ther Med* [Internet]. 2013;21(6):577–84. Available from: <http://dx.doi.org/10.1016/j.ctim.2013.08.009>
- [18] Khaleel M HH. Effectiveness of an Instructional Program on Knowledge of Patients with Renal Failure Undergoing Hemodialysis Concerning Self-Care in Baghdad Teaching Hospital. *Indian Journal of Forensic Medicine & Toxicology*. 2019;1(13):4.
- [19] Ali, N. M., Kadhim, A. J., &Khachian, A. (2023). Vibration and Exercise Maneuvers to Minimize Patients' Shoulder Pain Post laparoscopic cholecystectomy: A Randomized Clinical Trial. *Iraqi National Journal of Nursing Specialties*, 36(2), 110-116.

- [20] Showaya, A. H., Kadhim, A. J., &Khachian, A. K. (2023). Application of Medication-Specific Social Support Scale on Patients with Type II Diabetes Mellitus. *Mosul Journal of Nursing*, 11(2), 380-384.
- [21] Ali, N. M., Kadhim, A. J., &Khachian, A. K. (2023). Comparison between Vibration and Standard Exercises on Shoulder Pain for Patients Post Laparoscopic Cholecystectomy: A Comparative Study. *Mosul Journal of Nursing*, 11(2), 291-295.
- [22] Kadhim, A. J., Mohammadi, N., Hezbiyan, Z., Abbasinia, M., Norouzadeh, R., Taghadosi, M., &Aghaie, B. (2024). The effects of a mindfulness training intervention on fatigue and job satisfaction among emergency nurses: A quasi-experimental study.