IJPSR (2023), Volume 14, Issue 11 **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 18 March 2023; received in revised form, 09 May 2023; accepted 31 May 2023; published 01 November 2023

A STUDY ON THE ASSESSMENT OF PAIN AND SLEEP IN PATIENTS UNDERGOING HEMODIALYSIS AND PERITONEAL DIALYSIS

M. Niranjan Babu, Jyothi Basini *, B. S. Chathurya, Dayana Buduru, Divya Lakavath and M. Durga Prasad

Department of Pharm. D, Seven Hills College of Pharmacy, Tirupati - 517561, Andhra Pradesh, India.

Keywords:

Quality of life, Hemodialysis, Peritoneal dialysis, Pain intensity and sleep index

Correspondence to Author:
Dr. Jyothi Basini

Professor and Pharm. D Coordinator, Department of Pharm. D, Seven Hills College of Pharmacy, Tirupati - 517561, Andhra Pradesh, India.

E-mail: drjyothibasini@shcptirupati.edu.in

ABSTRACT: Background: Perception of pain and sleep disturbances are more prevalent in patients undergoing Dialysis. Assessing and determining the pain intensity and sleep disturbances help to establish the need for treatment, which is an important part of therapeutic intervention as they may affect the patient's Quality of life (QOL). This study was aimed to assess pain intensity and sleep disturbances in patients undergoing Hemodialysis (HD) and Peritoneal Dialysis (PD). **Methodology:** This cross-sectional and observational study was conducted in the Department of Nephrology. 89 patients (49 HD and 40 PD) were enrolled into the study that were undergoing hemodialysis and peritoneal dialysis and were assessed for the pain intensity and sleep disturbances using McGill Pain Questionnaire (MPQ) and Pittsburgh Sleep Quality Index (PSQI) respectively. **Results:** 67.34% of HD patients and 77.5% of PD patients experienced moderate to severe chronic pain. Female patients aged above 40 years and elderly patients experienced more pain compared to other groups and pain was also observed increasing with the duration of dialysis. 57.14% of HD patients and 67.5% of PD patients were poor sleepers. Males experienced poor sleep compared to females. **Conclusion:** Pain and sleep disorders are significant problems for the majority of dialysis patients and are not often assessed and managed. Increasing awareness of the significance and treatability of pain and sleep disturbances may provide the opportunity to improve dialysis patient's quality of life. It is necessary that the healthcare providers regularly enquire about pain symptoms and sleep disturbances and treat them effectively.

INTRODUCTION: Chronic Kidney Disease (CKD) is a global phenomenon with increasing incidence and prevalence. Globally, over 2 million people require Renal Replacement Therapy (RRT) to sustain life [1]. RRT replaces non-endocrine kidney function in patients with renal failure. These techniques include continuous hemofiltration and hemodialysis, intermittent dialysis and peritoneal dialysis [2].

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.14(11).5367-72

This article can be accessed online on www.ijpsr.com

DOI link: https://doi.org/10.13040/IJPSR.0975-8232.14(11).5367-72

Perception of pain and sleep disorders are more prevalent in patients with End Stage Renal Disease (ESRD). It was hypothesized that perception of pain and sleep disturbance would increase with CKD stage and would correlate with psychosocial variables [3].

80% of patients undergoing hemodialysis or peritoneal dialysis patients suffer from sleep abnormalities, and the prevalence is higher than half in general population. Recent reviews shown that 47% of patients with ESRD experience pain and this can be moderate to severe in 82%. Three quarters of ESRD patients suffers from insufficiently treated and untreated pain and sleep abnormalities [4, 5]. Determining pain intensity and sleep disturbances helps to establish the need for

treatment. The experience of pain and sleep disorders is unique to each individual. Listening to the patient validates the significance of the pain and sleep disturbances and is an important part of therapeutic intervention. Evaluation of pain and sleep disorders requires a comprehensive patient assessment that includes understanding the patient's diagnosis and medical history in additional to determining the effects of pain, sleep disorders and patient's psychological status, social functioning, functional status and Quality of Life (QOL) [4].

Melzack and Torgerson in 1971 developed the Mc Gill Pain Questionnaire (MPQ) to specify the qualities of pain. Differentiation of pain into affective, sensory and intensity features is one of the original contributions of MPQ. Pittsburgh Sleep Quality Index (PSQI) is the most widely used sleep quality assessment tool in both clinical and non-clinical population. PSQI comprises of 24 items or questions to be rated 0-3 for 20 items while 4 items are open-ended, 19 of which are self-reported and 5 of which require secondary feedback from bed partner or roommate. Self-reported items are used for quantitative evaluation of sleep quality perceived by the patient [6]. These questions are used to generate categorical sources representing 7 components of PSQI. Finally, the scores of each component are added to get a total score, which is also termed as global score (ranging 0–21), provides an efficient summary of the patient's sleep experience and quality for the past one month [7].

Three quarters of patients undergoing hemodialysis and peritoneal dialysis suffer from insufficiently treated or untreated pain and other sleep disorders. The purpose of the study is to assess the perception of pain and sleep disturbances. In light of the above, it is important that professionals working in dialysis units evaluate pain presence and intensity and involved subjective aspects, to institute timely management. In this sense, even being pain a common and clinically relevant experience in dialysis units, it has not been adequately appreciated, evaluated and treated in the clinical practice. So, we believe that this study might support professionals in planning actions giving priority to pain evaluation and control in chronic renal patients on hemodialysis.

METHODOLOGY: Department of Nephrology, Sri Venkateswara Institute of Medical Sciences, SPMC (W) – Tirupati, was selected as the field of work. The study was selected and framed after a thorough literature review and detailed discussion concerning the practical possibilities and difficulties.

The study proposal was prepared and the approval was obtained from the Head of the Institution and the Institutional ethical Committee (Roc. No. AS/ 11/ IEC/ SVIMS/ 2017; Dt: 17.03.2021). A detailed data collection form with a bilingual patient Informed Consent was prepared. Data collection was done according to inclusion and exclusion criteria. The detailed purpose of the study and benefits are explained in local language to the individual patients and care takers before obtaining the informed consent without any force or compulsion. All the patients who are undergoing hemodialysis and peritoneal dialysis in nephrology department were enrolled for the study. All the patients were examined and the demographic details, clinical features were documented and tabulated. The patients were evaluated with a valid questionnaires named McGill pain questionnaire (MPQ) and also evaluated with Pittsburgh sleep quality index (PSQI) for assessing pain intensity and sleep disturbances.

The detail of the scores were tabulated and were categorized accordingly and then used a criteria to compare the pain intensity and sleep disturbances among the patients who are undergoing hemodialysis and peritoneal dialysis respectively. All the clinical details and scores details were subjected to statistical analysis.

RESULTS: The available data from the medical records of 89 patients who were undergoing dialysis on follow up with nephrology department were included. Among 89 patients, 49 were on hemodialysis (male-37 and female-12) and 40 were on peritoneal dialysis (male-22 and female -18) **Fig. 1.** Among 89 patients, 49 patients of hemodialysis, (male- 6 and female-3) fall under the age group of 21-40 followed by (male-20 and female-7) fall under the age group of 41-60 and (male-13 and female-2) fall under the age group of 61-40 and it was represented in **Table 1.**

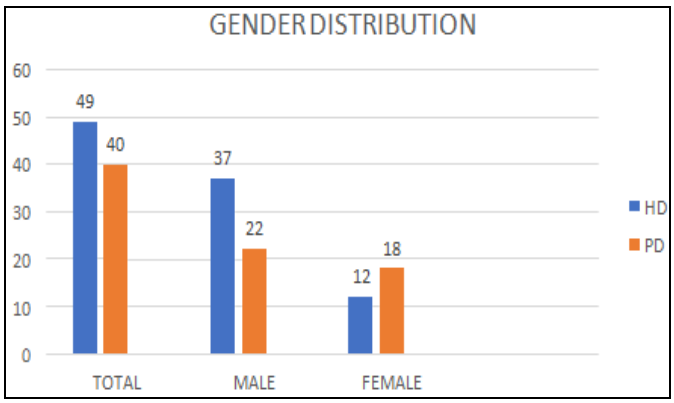

FIG. 1: GENDER DISTRIBUTION AMONG DIALYSIS PATIENTS

TABLE 1: AGE DISTRIBUTION AMONG HEMODIALYSIS PATIENTS

Age (years)	Hemodialysis	
	Male	Female
21-40	6	3
41-60	20	7
61-80	11	2

Among 40 patients, of peritoneal dialysis (male-3 and female-4) fall under the age group of 21-30 and (male-4 and female-1) fall under the age group of 31-60, followed by (male-4 and female-8) fall under the age group of 41-50 and (male-11 and female-5) fall under the age group of 51-60 and it was explained in **Table 2.**

TABLE 2: AGE DISTRIBUTION AMONG PERITONEAL DIALYSIS PATIENTS

Age (Years)	Peritoneal dialysis	
	Male	Female
21-30	3	4
31-40	4	1
41-50	4	8
51-60	11	5

From **Fig. 2**, it was stated that, all the patients were distributed based on their disease condition, among 49 patients of hemodialysis (diabetes mellitus-20), (glomerulonephritis-9), (renal polycystitis-12), (interstitial nephropathy -3), (others-7) and (unknown region-4) and among 40 patients of peritoneal dialysis (diabetes mellitus -17), (glomerulonephritis-6), (renal polycystitis-5), (interstitial nephropathy-1), (others-5) (unknown region-6).

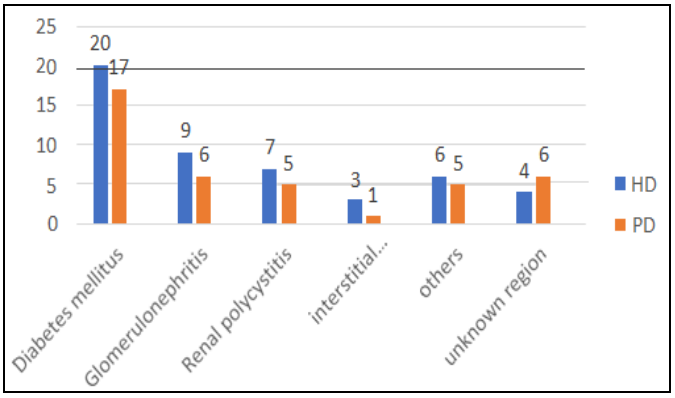

FIG. 2: DISTRIBUTION OF PATIENTS SAMPLE SIZE BASED ON DISEASE CONDITION

Out of 49 patients of hemodialysis the pain intensity score was (mild-10), (discomforting-16), (distressing -13), (horrible-8), (excruciating pain-2). Out of 40 patients of peritoneal dialysis the pain intensity score was (mild -9), (discomforting-11), (distressing-12), (horrible-5), (excruciating pain-3) **Table 3** and **Fig. 3.**

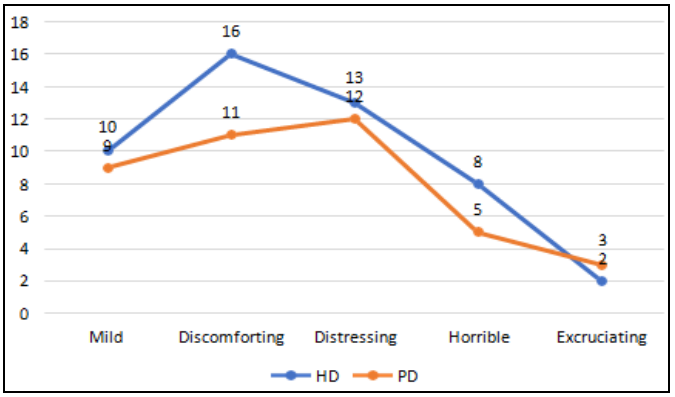

FIG. 3: DISTRIBUTION BASED ON INTENSITY OF PAIN AMONG HEMODIALYSIS AND PERITONEAL DIALYSIS PATIENTS

TABLE 3: DISTRIBUTION OF PATIENT SAMPLE SIZE BASED ON INTENSITY OF PAIN

Type of pain	Hemodialysis	Frequency	Peritonealdialysis	Frequency
Mild	10	20.4%	9	22.5%
Discom-forting	16	32.6%	11	27.5%

Out of 49 patients of hemodialysis the Global pain scores were, (0-10)-2, (11-20)-14, (21-30) -15, (31-40)-18 and among 40 patients of peritoneal dialysis the pain scores were (0-10)-0, (11-20) -9, (21-30)-21, (31-40) -10 **Fig. 4**. From **Table 4**, Out of 89 patients undergoing dialysis, uncomfortable factors associated during the sleep were, (loud snoring, long pauses between breathe during sleep, twitching or jerking of the legs while asleep, episodes of disorientation or confusion during the sleep).

TABLE 4: UNCOMFORTABLE FACTORS DURING SLEEP AMONG HEMODIALYSIS AND PERITONEAL DIALYSIS PATIENTS

Factors	Type	Never	Less thanonce (in amonth)	Once ortwice (in a month)	Three ormore (ina month)
Loud snoring	HD	28	3	5	13
	PD	31	4	1	5
Long pauses between the breathe	HD	41	3	2	3
whileasleep	PD	33	4	1	2
Twitching or jerking of legswhile	HD	22	3	8	16
asleep	PD	18	3	7	12
Episodes of disorientation or	HD	26	7	4	12
confusion duringsleep	PD	23	3	5	9

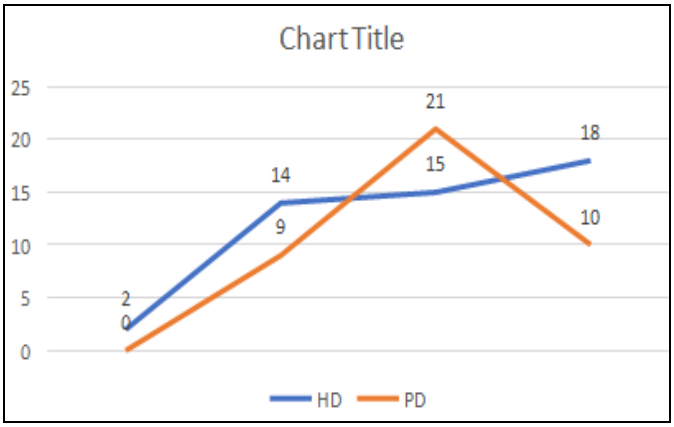

FIG. 4: DISTRIBUTION OF GLOBAL PAIN SCORE AMONG DIALYSIS PATIENTS

Distribution of type of sleep based on dialysis, among 49 patients of hemodialysis (poor sleepers-28), (good sleepers-21), among 40 patients of peritoneal dialysis (poor sleepers-27), (good sleepers-13), it was depicted in **Fig. 5.**

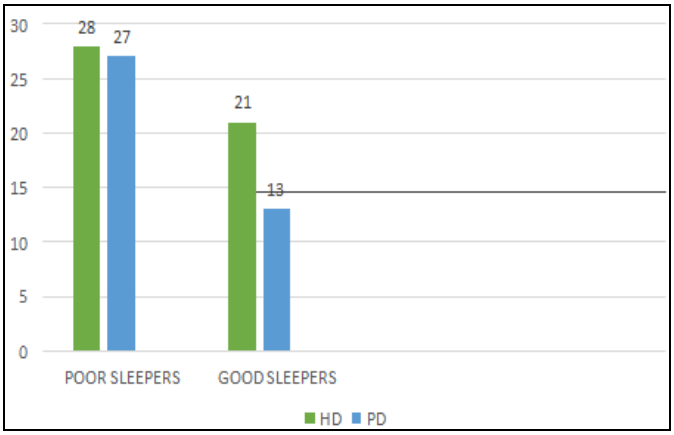

FIG. 5: DISTRIBUTION OF TYPE OF SLEEPERS BASED ON DIALYSIS

Out of 89 patients, 49 were hemodialysis and 40 were peritoneal dialysis and the mean pain intensity scores among them were (HD-25.28), (PD-26) and standard deviation values were (HD-8.61), (PD-6.4). The values were represented in **Fig. 6.**

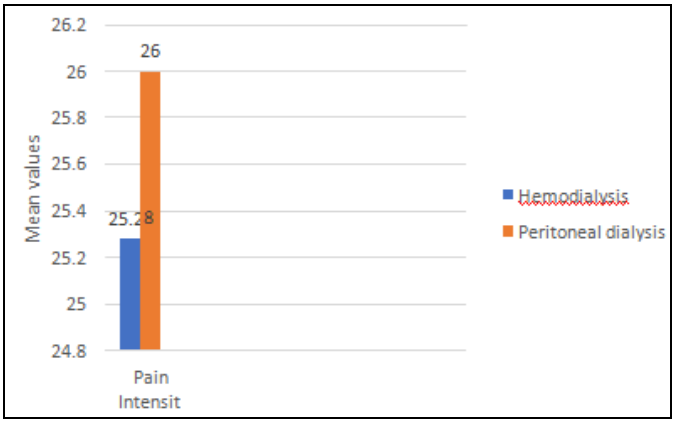

FIG. 6: COMPARISON OF PAIN INTENSITY AMONG HEMODIALYSIS AND PERITONEAL DIALYSIS PATIENTS

Out of 89 patients, 49 were hemodialysis and 40 were peritoneal dialysis and the mean sleep s scores among them were (HD-13.7), (PD-6.42) and standard deviation values were (HD- 2.15), (PD-1.97) **Fig. 7.**

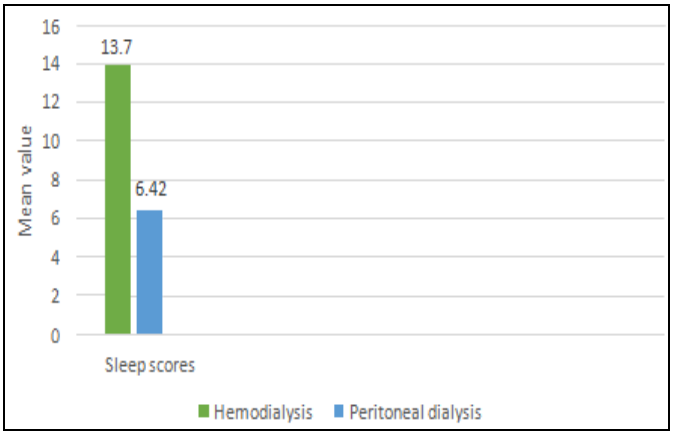

FIG. 7: COMPARISON OF SLEEP SCORES AMONG HEMODIALYSIS AND PERITONEAL DIALYSIS PATIENTS

DISCUSSION: The present study was carried out with 89 patients among which 49 patients were undergoing hemodialysis and 40 patients were on peritoneal dialysis in the department of Nephrology

of SVIMS hospital, Tirupati. Patients with CKD frequently experience pain and sleep disturbances. It is estimated that 10– 20% of the general adult population undergoing dialysis suffers from many physical and emotional symptoms and display high pain prevalence, sleep disorders which furtherly causes significant disruption of quality of life. It was observed that there was relatively less information about the origin, incidence and treatment of pain among dialysis patients. Based on the data from several surveys 50-60% of dialysis patients experience pain often very severe and not effectively managed. In present study, pain also included with physical limitation which is interfering with the daily activities and negatively affecting the quality of life.

Insomnia is the most prevalent of the sleep disorders in dialysis patients followed by obstructive sleep apnea syndrome. These disorders play a vital role in affecting patient's quality of life and mortality risk as sleep disturbances are referred as to one of the most important distressing symptoms. Increased mortality risk among patients on dialysis affected by sleep disorders has been described by several epidemiological studies. In our study, the chronic pain prevalence among prevalent HD patients was 67.34% and in PD patients was 77.5%. The prevalence of chronic pain among HD patients was 52% in the study by Tarek *et al*., 50% in the study of Davison *et al.*, and 47% in the systemic review by Murtagh *et al*. In a study by Weisbord *et al*., the prevalence of pain was of 43% in a cohort of both hemodialysis and peritoneal dialysis patients[8].

In the present study, mild pain was observed in 20.4% in HD patients and 22.5% of PD patients. Discomforting pain was observed in 32.6% of HD patients and 27.5% of PD patients. Distressing pain was observed in 26.53% of HD patients and 30% of PD patients. Horrible pain was observed in 16.32% of HD patients and 12.5% of PD patients. Excruciating pain was observed in 4.08% of HD patients and 7.5% of PD patients. As the dialysis duration increased, the incidence of pain increased in the present study. Pain index was seen more prevalent in female patients of aged 41-60 years patients irrespective of the type of dialysis in the present study. Some studies reported no effect on pain of patient age and gender among dialysis patients. The study by Sadigova E *et al*. Reported that females and older patients had more incidence of pain among dialysis patients, similar to our results[9]. Females are more sensitive to pain due to mechanisms related to both central and peripheral perception systems. In general population, elderly patients are more susceptible to chronic pain and it is hypothesized that this situation may be due to pain formation linked to evolutional changes and chronic diseases in the organisms, pain being due more too degenerative changes in the locomotive system, and inorganic reasons such as fear and depression. The results show that dialysis patients commonly experience sleep problems and most of them have poor quality of sleep.

In present study, 57.14 % of HD patients were poor sleepers and 67.5% of PD patients were poor sleepers. Few studies have evaluated sleep disturbances in patients with early-stage CKD. Maria Ralli *et al*. Studied the prevalence of sleep in patients who had CKD using the PSQI as a measure of perception of disturbed sleep, they reported that out of 350 patients 82.7% patients had poor sleep, as defined by a global PSQI score of >5. Males experienced poor sleep compared to females [10]. Loud snoring was observed in 63.2% of HD patients and 25% of PD patients. Long pauses between the breathe while asleep was observed in 16.32% of HD patients and 17.5% of PD patients. Twitching or jerking of legs while asleep was observed in 55.1% of HD patients and 55% of PD patients. An episode of disorientation or confusion during sleep was observed in 46% of HD patients and 42.5% of PD patients.

In conclusion, pain and sleep disorders are significant problems for the majority of dialysis patients and are significantly associated with female gender, increasing age, dialysis duration and is not effectively managed. Increasing awareness of the significance, prevalence and treatability of pain and sleep disorders and its underlying conditions in patients on dialysis may facilitate the routine assessment and implementation of therapy and provide an opportunity to improve dialysis patients' quality of life. To increase the quality of life of dialysis patients, it is necessary that the care team, including nephrologists, physicians, dialysis technicians, nurses and pharmacists, regularly

enquire about pain symptoms and sleep disturbances and treat them effectively.

CONCLUSION: As renal patients are an increasing group of healthcare service users, and pain is affecting their day-to-day life, it is essential to individualize pain evaluation. Pain assessment is a necessary therapeutic intervention. It is necessary to provide further education to manage pain effectively. A detailed history focusing on pain location, duration and associated symptoms and relieving factors should be obtained for the better understanding of each dimension of pain, assessment and its management. Poor sleep quality impact the person's quality of life. However, despite their frequency and importance, such conditions go unnoticed, since all patients do not clearly experience fully expressed symptoms. Therefore, sleep disturbances in dialysis patients should be considered by healthcare providers as one of the challenging problem problems and early detection and intervention to improve the quality of sleep should be necessary. Further studies are required for the better understanding of risk factors associated with a poor quality of sleep to find possible treatments for the patients.

ACKNOWLEDGEMENTS: We acknowledge management of SVIMS-Sri Padmavathi Medical College for women, Tirupati, Andhra Pradesh, India and Seven hills college of pharmacy (Autonomous), Tirupati, Andhra Pradesh, India for their valuable support.

CONFLICTS OF INTEREST: Nil, There is no conflict of interest.

REFERENCES:

1. Akshaya S, Ginit P Samuel, Haritha PV, Haroon S Asharaf and Radhakrishnan Rahul: Assessment on severity of pain and evaluation of effectiveness of pain management in haemodialysis patients. Word Journal of Pharmaceutical Research 2022; 11(11): 556-565.
2. Tandukar S and Palevsky PM: Continuous Renal Replacement Therapy. Chest 2019; 155(3): 626-638. doi: 10.1016/j.chest.2018.09.004
3. Chao-Ying Tu, Yu-Hsiang Chou, Yu-Hsuan Lin and Wei-Lieh Huang: Sleep and emotional disturbance in patients with non-dialysis chronic kidney disease. Journal of the Formosan Medical Association 2019; 118(6): 986-994.
4. Muscat P, Weinman J and Farrugia E: Illness perceptions predict mortality in patients with predialysis chronic kidney disease: a prospective observational study. BMC Nephrol 2020; 21: 537. https://doi.org/10.1186/s12882-020-02189-7.
5. Manzar Dilshad, Bahammam, Ahmed, Hameed, Unaise, Spence, D, Pandi-Perumal, Seithikurippu R and Moscovitch: Adam. Dimensionality of the Pittsburgh Sleep Quality Index: A systematic review. Health and Quality of Life Outcomes 2018; 16: 89.
6. Buysse DJ, Reynolds CF, Monk TH, Berman SR and Kupfer DJ: The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. Psychiatry Res 1989; 28: 193-213.
7. You AS, Kalantar SS and Norris KC: Dialysis symptom index burden and symptom clusters in a prospective cohort of dialysis patients. J Nephrol 2022; 35: 1427–1436. https://doi.org/10.1007/s40620-022-01313-0.
8. Sadigova E, Ozkurt S and Yalcin AU: Pain Assessment in Hemodialysis Patients. Cureus 2020; 12(2): 6903. doi: 10.7759/cureus.6903.
9. Maria Ralli, Maria Tsironi, Georgios Panoutsopoulos, Petros Kolovos, Adamantia Aroni and Sofia Zyga: Sleep and quality of life in relation to dialysis adequacy in chronic kidney disease patients undergoing hemodialysis. International J of Caring Sciences 2022; 15(3): 1753.
10. Minasadat Hosseini, Maryam Nasrabadi, Ensiyeh Mollanoroozy, Fatemeh Khani, Zah ra Mohammadi, Faeze Barzanoni, Asieh Amini and Ali Gholami: Relationship of sleep duration and sleep quality with health-related quality of life in patients on hemodialysis in Neyshabur. Sleep Medicine X 2023; 5: 100064.

How to cite this article:
Babu MN, Basini J, Chathurya BS, Buduru D, Lakavath D and Prasad MD: A study on the assessment of pain and sleep in patients undergoing hemodialysis and peritoneal dialysis. Int J Pharm Sci & Res 2023; 14(11): 5367-72. doi: 10.13040/IJPSR.0975-8232.14(11).5367-72.