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Effectiveness of Acupressure Therapy on the Quality of Sleep among Patients undergoing Hemodialysis

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ABSTRACT

80% of the ESRD patients undergoing dialysis suffer from insomnia. The present study was conducted to assess the effectiveness of acupressure therapy on the quality of sleep among hemodialysis patients in selected hospitals of Indore. Through purposive sampling technique a total of 80 samples were selected from the accessible population and then samples were assigned to experimental and control group. After the pre-test acupressure therapy was given to the experimental group. Control received routine care provided in the dialysis unit. The quality of sleep was assessed before and after intervention among both the group using Pittsburgh Sleep Quality Index (PSQI). Findings of the study revealed that there is a significant improvement in the quality of sleep with acupressure therapy at the level $p \leq 0.001$ in the experimental group.

Key words: Hemodialysis, Acupressure therapy, Quality of sleep, Pittsburgh Sleep Quality Index (PSQI)

BACKGROUND

Chronic kidney disease (CKD) and end-stage renal disease (ESRD) are emerging public health problems in developing countries. ESRD incidence data are not available from large parts of the developing world including South Asia. In India a survey conducted by Screening and Early Evaluation of Kidney Disease recently estimated that the age-adjusted incidence rate of ESRD to be 229 per million population (pmp), and >100,000 new patients enter renal replacement programs annually. ESRD incidence was estimated for four consecutive calendar years (2002–2005) among 572 029 subjects residing in 36 of the 56 wards of the city of Bhopal. They found the mean age was 47 years, and 58% were males and diabetic nephropathy was the commonest (44%) cause of ESRD. **(G.K Modi, 2006)[2]**

Sleep is essential for a person's health and well-being. Sleep is not just the absence of wakefulness rather; it is a complex and multi-dimensional state. Sleep influences all major systems of the body. Sleep deprivation can drastically change an individual's thinking and behavior and negatively impact their physical, mental, and emotional health. **(National Sleep Foundation)[3]**

Many treatments such as use of sleeping medications, positive air way pressure during sleep, bronchodilators etc are administered on hemodialysis patients and the effectiveness of these method have been reported; however, most of the time these methods are not available or are expensive. So, it is essential to use new treatment methods to promote quality of sleep in these patients. **(Tsaya SL, 2003)[8]**

Today's complimentary treatments such as acupuncture and acupressure which confirmed by Food and Drug Organization in 1997 are used in curing different disturbances. Regarding the increase in prevalence of blood transmitted disease such as AIDS from 1981, tendency of general population have been changed toward acupressure. **(Reza et al., 2010)[9]**

A study was conducted to test the effectiveness of acupressure on sleep quality of end-stage renal disease patients. The study was a randomized controlled trial. Qualified patients in the dialysis centers of four major hospitals of Taiwan were randomly assigned into an acupressure group, a sham acupressure group, and a control group. A total of 98 participants were included in the study. The main outcomes measured were the Pittsburgh sleep quality index (PSQI) and the sleep log. The results indicated that PSQI scores of the acupressure group have a significantly greater improvement (po0:01) than the control group. Sleep log data revealed that the acupressure group significantly decreased awake time and improved quality of sleep over time more than the control group (po0:01). The improvement could be seen as soon as the acupoints massage was implemented, and it was maintained through the post intervention. The study revealed the effectiveness of acupressure therapy in improving the quality of sleep and life quality of end- stage renal disease patients, and offers a noninvasive therapy for sleep-disturbed patients. **(Tsay SL, 2003)[8]**

NEED OF THESTUDY

Chronic kidney disease (CKD) is a global threat to health in general and for developing countries in particular, because therapy is expensive and life-long. Over 1 million people worldwide are alive on dialysis or with a functioning graft. Incidence of CKD has doubled in the last 15 years. The study also revealed that the incidence of chronic renal failure is high in India. **(Prabhar ,M.R, 2012)[11]**

A study was conducted to find out prevalence and correlation of insomnia and obstructive sleep apnea in chronic kidney disease. One hundred and four adults with CKD were included. Their demographic data, details regarding kidney disease and hemodialysis (HD) were recorded. Presence of insomnia and its severity was assessed. They were screened for sleep apnea using a validated questionnaire. Average age was

54.17 (± 12.96) years. 89.4% had stage 5 nephropathy and 78.8% subjects were on regular HD. Males outnumbered females. Insomnia was reported by 35.5%. Among these, 50% had chronic insomnia. Insomnia subjects had higher prevalence of diabetes (P = 0.01) and depression (P < 0.001). Insomnia was prevalent in CKD. Nearly half of these patients are at high risk for sleep apnea and one-third of them suffer from insomnia. Hence, these patients should be screened for sleep disorders. **(Ahmad S, 2013)[13]**

Acupressure is an ancient Chinese healing art that has been used for thousands of years to treat and heal a variety of physical and mental conditions. The practice is based on the use of deep massage and applied pressure to pressure points and energy meridians located on specific parts of your body. These points and meridians are believed to correspond to energy imbalances and help restore the normal "life" flow, known as *qi* in Chinese medicine. Acupressure is thought to help remove toxins, improve circulation, reduce muscle pain and release endorphins. **(D.V Smith, 2013)[14]**

A study was conducted to investigate the effects of acupressure on sleep quality in hemodialysis patients. The setting of the study was dialysis wards located in two university hospitals (Imam and Golestan) in Ahvaz, Iran. 48 end-stage renal disease patients on hemodialysis who scored 5 points or higher on the Pittsburgh Sleep Quality Index (PSQI) were enrolled to the study. Acupressure group received acupressure intervention on the Shenmen and He Gu points in the hands and Sanyingjao (sp6) point in the feet for 4 weeks beside routine care and control group received only routine care. The result indicated significant differences between the acupressure group and the control group after intervention in PSQI global scores ($p<0.001$) and all sleep quality indices between two groups after intervention: subjective sleep quality ($p<0.001$), sleep latency ($p<0.001$), sleep duration ($p<0.001$), sleep efficiency ($p=0.006$), sleep disturbance ($p<0.001$), the use of sleeping medication ($p=0.028$), and daytime dysfunction ($p<0.001$). This study supports the effectiveness of acupressure in improving sleep quality of end-stage renal disease patients as a noninvasive therapy. **(Shariati A et al, 2012)[15]**

PROBLEM STATEMENT

A quasi-experimental study to assess the effectiveness of acupressure therapy on the quality of sleep among hemodialysis patients in dialysis units of selected hospitals of Indore during the year 2023-2024.

OBJECTIVES OF THE STUDY

- To assess the quality of sleep among experimental and control group of patients undergoing hemodialysis.
- To find the association between pre-interventional quality of sleep and selected demographic variables among hemodialysis patients.
- To assess the effectiveness of acupressure therapy on quality of sleep among experimental group of patients undergoing hemodialysis.

- To compare the difference in quality of sleep among experimental group and control group after acupressure therapy.

HYPOTHESIS

H1: There is a significant difference in the quality of sleep among hemodialysis patients after acupressure therapy at the level $p < 0.05$.

H2: There is a significant difference in the quality of sleep among experimental group and control group of hemodialysis patients with acupressure therapy at the level $p<0.05$.

H3: There is a significant difference in the pre- interventional and post-interventional component scores of Pittsburgh Sleep Quality Index among experimental group at the level $p < 0.05$.

H4: There is a significant association between selected demographic variables and pre- interventional quality of sleep among hemodialysis patients at the level $p < 0.05$.

CONCEPTUAL FRAMEWORK

The conceptual framework in this study is based on "Traditional Chinese Medicine Theory".

RESEARCH METHODOLY

Research design: Quasi experimental design.

Population: Patients undergoing hemodialysis having Pittsburgh Sleep Quality Index global score < 5.

Sample size: 80 samples (40 in experimental and 40 in control group)

Setting: Varma Union Hospital, Indore

Tool: The tool for collection of data for this study consisted of three sections.

Section A : Part- 1 Socio demographic variables

: Part- 2 Clinical Variables

Section B: Pittsburgh Sleep Quality Index (PSQI)

SECTION A: Socio- demographic variables and clinical profile

This section consists of two parts, 13 items for obtaining information about selected demographic variables such as age, gender, marital status, educational status, occupation, type of family, monthly family income, use of caffeinated drinks per day, habits, frequency of alcohol, frequency of smoking, eating; and 3 items for obtaining information about co- morbid conditions, physical deformity, duration of hemodialysis.

Section A: Pittsburgh Sleep Quality Index (PSQI)

The standardized PSQI given by Daniel J Buysse was used to score the quality of sleep. The PSQI measures sleep over a 1 month period. The PSQI discriminates between good and poor sleepers. The instrument consists of 10 items. The 10 items are grouped into 7 equally weighted component scores: 1) Subjective Sleep Quality [1 item]; 2) Sleep Latency [2 items]; 3) Sleep Duration [1 item]; 4) Habitual Sleep Efficiency [3 items]; 5) Sleep Disturbances [9 items]; 6) Sleep Medication [1 item]; and 7) Daytime Dysfunction [1 item]. The global PSQI score ranges from 0 to 21. All component score range from 0 to 3.

Scoring has been categorized in following manner:

0-5	-	Healthy sleep
6-10	-	Mild impaired sleep
11-15	-	Moderately impaired sleep
16-21	-	Severely impaired sleep

VALIDITY

The was submitted to 7 experts including 4 nursing personnels from Medical Surgical Nursing, one acupressure consultant, one Nephrologist and one Statistician. The experts were requested to check the relevance, sequence and content of the Section A and express their opinion regarding Section B in the tool.

RELIABILITY OF THE TOOL

The tool was standardized.

The reliability of Pittsburgh Sleep Quality Index (PSQI) is 0.83 calculated by Cronbach's alpha coefficient. This indicates high internal consistency. Reliability of PSQI is established by test retest method and the score is r= 0.83.

PROCEDURE FOR DATA COLLECTION

Pre-procedure

- Permission was taken from the hospital authorities
- Selected samples as per the inclusion criteria of the study
- Through purposive sampling technique 80 samples were selected from the accessible population.
- Out of 80 selected samples 40 patients each were assigned to experimental and control group by purposive sampling technique.
- Procedure was explained and consent was taken from all samples

Procedure

- Quality of sleep was assessed by using Pittsburgh Sleep Quality Index before intervention.
- Intervention was planned for twice a week for four consecutive weeks. Hence acupressure therapy was administered in 8 sessions. Each session longed for 6 minutes.
- In the first session researcher demonstrated acupressure therapy to improve sleep quality. A total of 5 acupressure points were together stimulated to improve the quality of sleep. Patients were explained about how the intervention works. Patients were asked to do acupressure therapy at home before going to bed.
- Researcher provided the samples with a pamphlet explaining the acupressure points and method of doing acupressure therapy. Researcher asked the samples to do acupressure therapy daily before going to the bed.
- Control group were asked to continue with the routine care of the dialysis unit.

Post- procedure

- After the 8th session i.e four weeks of intervention, the researcher assessed quality of sleep among the samples by using Pittsburgh Sleep Quality Index (PSQI). It was done to assess the post-interventional change in the quality of sleep among the study samples.

Follow up:

The samples of the experimental and control group were explained the effectiveness of acupressure therapy on the sleep quality. Patients were provided with pamphlet explaining the procedure/ how to do acupressure therapy. Patients and their relatives were trained to perform acupressure therapy by the researcher.

FINDINGS

1. In the study the present study it was found that in experimental female samples 22 (55%) outnumbered the male 18 (45%) and in control group male samples 28(70%) outnumbered the females (30%).
2. Half of the samples 20(50%) in experimental group belonged to the age group of 40-60 years. In control group 14 (35%) had age group of 60-79 years.
3. It was found that the educational status of the samples in the experimental group to be; 16 (45%) were graduate, whereas in the control group one third of the samples 14 (35%) had primary school education.
4. In case of marital status more than half of the samples in both experimental and control group 72 (90%) were married.
5. Regarding the type of family nearly two-third of the samples in the experimental group 26 (65%) belonged to joint family and while in control group two-third of the samples 28 (70%) belonged to joint family.
6. It was found that majority of samples in experimental group 36(90%) and control group 34(85%) were unemployed.
7. The data concerning monthly family income revealed that half of the samples 20(50%) in the experimental group had a monthly income of Rs. 50001 above whereas in control group nearly two-third 26(65%) a monthly income of Rs. 50001 above.
8. Majority of the samples in the experimental and control group 28(70%) were residents of urban area.
9. Regarding the consumption of caffeinated drinks, two-third of the samples 28 (70%) in the experimental group consumed less than 3 caffeinated drinks per day, while in control group majority of the samples 38 (95%) consumed less than 3 caffeinated drinks per day.
10. It was found that more than three-fourth of the samples 36 (90%) didn't had any habits while 4(10%) had smoking as a habit. In control group more than tree-fourth of the samples 34 (85%) didn't had any habits, while 6(15%) of the samples had smoking as a habit.
11. Two- third of the samples in experimental group 30 (75%) were vegetarian while one-fourth were non-vegetarian. In control group nearly two-third of the samples 26 (35%) were non-vegetarians.
12. All of the samples in both experimental and control group 40 (100%) had co-morbid diseases.
13. Findings revealed that in experimental group nearly two- third 28(70%) of the samples was undergoing dialysis for last 2-8 years. Whereas in control group about one-third of the samples 18 (45%) were under dialysis treatment for last 2-8 years.
14. Data obtained from the study revealed that in experimental group more than half 24(60%) samples and in control group half of the samples 20(50%) were from a upper middle socio-economical class.

15. The data was found that in experimental group before the administration of acupressure therapy nearly two-third of samples 26 (65%)were having severely impaired sleep, while 12 (30%) samples had moderately impaired sleep and only 2(5%) had mild impaired sleep. After acupressure therapy quality of sleep improved markedly. Half of the samples 20 (50%) attained healthy sleep, 18(45%) samples had mild impaired sleep and only 2 (5%) remained in moderately healthy sleep.
16. Data obtained from the study revealed that in control group with routine care the quality of sleep remained the same. Half of the samples 20 (50%) were having severely impaired sleep, 18 (45%) had moderately impaired sleep and only one 2(5%) had mild impaired sleep.
17. Findings revealed that there is no significant difference in the values of quality of sleep scores among experimental and control group before intervention at $p \leq 0.05$ level and found that the experimental and control group were homogeneous and from same universe.
18. Research study revealed that in experimental group there is a significant association between selected demographic variables like age, gender, occupation, educational status and duration of dialysis treatment with quality of sleep at $p \leq 0.05$ level.
19. Data showed that in control group there is a significant association between selected demographic variables like gender, age and duration of dialysis treatment with quality of sleep at $p \leq 0.05$ level.
20. Data revealed that the computed "t" value 15.2 was significant at the level $p \leq 0.001$, at df 19 with SD 3.17 and computed "t" value indicates that there was a significant improvement in the quality of sleep among experimental group of dialysis patients at $p \leq 0.001$ level.
21. Data obtained from the study revealed that there is a significant improvement in the component scores of Pittsburgh Sleep Quality Index i.e., subjective sleep quality ($p \leq 0.05$), sleep latency ($p \leq 0.05$), sleep duration ($p \leq 0.05$), habitual sleep efficiency ($p \leq 0.05$), sleep disturbance ($p \leq 0.05$), sleep dysfunction ($p \leq 0.05$).
22. The data was found that the computed "t" value 12.21 at df 38 with SD 2.54 indicates that there was a significant difference between post test score of quality of sleep among experimental and control group at the level $p \leq 0.001$.

DISCUSSION

Socio-demographic variables

In experimental group more than half of the samples i.e., 22 (55%) were male and 18 (45%) were female. Half of the patients belonged to the age group of 40-60 years. Nearly half of the samples had 16 (45%) had graduation degree. Majority of the samples 36(90%) were unemployed, half of the samples 20 (50%) had a monthly income of Rs. 15000 and above, all of the samples 40 (100%) were having associated co- morbid diseases and two- third samples 28 (70) were undergoing dialysis treatment from last 2-8 years.

In control group two- third samples 28 (70%) were male and one- third samples 14 (35%) belonged to the age group of 60-80 years. One- third of the samples 14 (35%) had primary school education, more than three- fourth of the samples 34 (85%) were unemployed, majority of the samples 26 (65%) had monthly income of Rs. 15000 and above, all of the samples 40 (100%) were having associated co- morbid diseases and nearly half of the samples 18 (45%) were undergoing dialysis treatment from last 2-8 years.

The above findings can be supported from the following studies

Y.J Anupama et.al 2014 (Karnataka, India) did a study to investigate the prevalence of CKD in a South Indian rural community. Door-to-door screening of 2091 people aged 18 and above was carried out. The total number of subjects studied was 2091. There was a statistically significant relationship of CKD with gender, advancing age, abdominal obesity, smoking, presence of diabetes and hypertension. Mean age was 39.88 ± 15.87 years. The subjects were predominantly young with more than 70% aged below 40 years. 45.57% were males. There was a female preponderance with females constituting (54.43%) of the population studied. 36.39% did not have any education, whereas 29.17% and 23.81% had primary and higher secondary education respectively. Only 11% had received any form of college education. Majority of them (nearly 85%) were either unemployed or were working as laborers, usually agricultural laborers. The prevalence of diabetes in this study was 3.82%. Hypertension was seen in 702 (33.62%) subjects of whom only 106 (15.07%) subjects gave a history of hypertension indicating that nearly 84.93%. this study attempts to highlight that one in every twenty individuals is suffering from CKD. There is a strikingly increasing prevalence of life-style diseases such as hypertension and obesity in the villages and there is a tendency for the younger people to be affected with chronic disease.

Joshwa B 2012 (India) did a study to determine the prevalence of fatigue, depression and sleep problems and their association among our MHD patients The mean age of the study population was 37.1 ± 13.1 (range 19-65 years) years, with 89.3% being males. The mean age of the study population was 37.1 ± 13.1 years (range 19-65 years, median 34 years); 89.3% were male, 51% were graduates, 53.2% were employed, 36.1% received medical reimbursement and 42.5% resided in villages, while the rest were city dwellers. The majority (68.1%) of the MHD patients was poor sleepers, but only five (10.6%) patients had borderline or abnormal daytime sleepiness. The study revealed a high prevalence of poor sleep quality in our MHD patients. Quality of sleep was closely related to the socioeconomic and demographic profiles of the population.

Assessment of quality of sleep among experimental group and control group of hemodialysis patients

In experimental group it was found that more nearly two- third of the samples i.e., 26 (65%) were having severely impaired sleep, one-fourth samples 12(30%) were having moderately impaired sleep, only 2 (5%) had mild impaired sleep before intervention. After acupressure therapy it was found that half of the samples

20 (50%) obtained healthy sleep, nearly half of the samples 18 (45%) attained mild impaired sleep and only 2 (5%) of the samples had moderately impaired sleep.

In control group half of the samples 20 (50%) were having severely impaired sleep, 14 (35%) were having moderately impaired sleep, three- fourth of the samples 6 (15%) were having mild impaired sleep. In post test half of the samples 20 (50%) remained in severely impaired category, 18(45%) were having moderately impaired sleep and 2 (5%) of the samples were having mild impaired sleep.

The above findings can be supported from the following study

Bastos JPC et.al 2007 did a study to investigate the quality of sleep and sleep abnormalities in patients with ESRD. One hundred consecutive patients from a dialysis center were assigned in the study. Quality of sleep was assessed by the Pittsburgh Sleep Quality Index. Poor quality sleep (PSQI>6) was found in 75% of cases. Data indicate that RLS, poor quality sleep and EDS are common in end-stage-renal-disease patients under hemodialysis.

Araujo S M et.al 2011 (Brazil) had conducted a cross sectional observational study to access the quality of sleep and day time sleepiness in chronic hemodialysis patients. 400 patients were selected from three hemodialysis centers. Quality of sleep was evaluated by the Pittsburgh sleep quality index. The result shown that poor sleep quality was found in 227 (57%) individuals. And the study concluded that poor sleep quality were prevalent on chronic hemodialysis.

Association between quality of sleep and selected demographic variables among experimental and control group of patients

In the present study there was significant association between quality of sleep and selected demographic variables like age, gender, occupation, type of family and duration of dialysis treatment.

Hence H_3- There is a significant association between selected demographic variables and quality of sleep among hemodialysis patients at the level $p< 0.05$ is accepted.

The above findings can be supported from the following study

An association between age and sleep quality in ESRD patients is also reported by some studies.[18,25,30]

Effectiveness of acupressure therapy on the quality of sleep among experimental group of hemodialysis patients.

The mean difference of pre test and post test score of quality of sleep in the experimental group was 10.7. The improvement in the quality of sleep score was found statistically significant at the level $p \leq 0.001$. Thus acupressure therapy is effective to improve the quality of sleep among patients undergoing hemodialysis treatment.

Hence H_1- There is a significant difference in the quality of sleep among hemodialysis patients after acupressure therapy at the level $p < 0.05$ is accepted.

The above findings can be supported from a study conducted by Shariati A et al, 2012. An experimental study was conducted to investigate the effects of acupressure on sleep quality in hemodialysis patients. The setting of the study was dialysis wards located in two university hospitals (Imam and Golestan) in Ahvaz, Iran. 48 end-stage renal disease patients on hemodialysis who scored 5 points or higher on the Pittsburgh Sleep Quality Index (PSQI) were enrolled to the study. Acupressure group received acupressure intervention on the Shenmen and He Gu points in the hands and Sanyingjao (sp6) point in the feet for 4 weeks beside routine care and control group received only routine care. The result indicated significant differences between the acupressure group and the control group after intervention in PSQI global scores ($p<0.001$) and all sleep quality indices between two groups after intervention: subjective sleep quality ($p<0.001$), sleep latency ($p<0.001$), sleep duration ($p<0.001$), sleep efficiency ($p=0.006$), sleep disturbance ($p<0.001$), the use of sleeping medication ($p=0.028$), and daytime dysfunction ($p<0.001$). This study supports the effectiveness of acupressure in improving sleep quality of end-stage renal disease patients as a noninvasive therapy.[12]

CONCLUSION

The findings revealed that the acupressure therapy is effective in improving the quality of sleep among hemodialysis patients. Acupressure therapy is an alternative medicine which is non-invasive, totally inexpensive to improve the quality of sleep. Researcher suggests that nurses are the first person in the dialysis unit who can introduce alternative therapies like acupressure therapy to the hemodialysis patients. Trained hands can perform acupressure therapy successfully and it can alleviate one among many problems face by hemodialysis patients. Hence the quality of life among the patients can be enhanced. It is suggested that more nursing studies could be done on non-pharmacological therapies to improve the quality of sleep among hemodialysis patients.