

Effects of Modification of Self-Freedom (Self-Submission) Exercise on Sleep Quality Indicators *Pittsburgh Sleep Quality Index (PSQI)* Approach in Hemodialysis Patients

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Abstract

Sleep disorders occur to patients with chronic kidney disease (CKD), especially clients with end-stage renal disease (ESRD). Hemodialysis patients treated by Cognitive Behavior Therapy (CBT) can significantly improve sleep quality, fatigue, depression, and anxiety. Self-help exercise (LPD) is part of Complementary and Alternative Medicine (CAM) that combines relaxation and *dhikir*. This study aims to find out the effect of modification of self-absorption exercise on sleep quality of patients with chronic kidney disease undergoing hemodialysis. This research type is Quasy-Experiment research with a pre-post test design control group design study. The Pittsburgh Sleep Quality Index (PSQI) questionnaire was used for pre-post test in this study. The independent variables of the study were modification of self-absorption exercise given for 18 days and done 2 times per day. The dependent variable was sleep quality, with sub variable of subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, daytime dysfunction. The population of the study was PGK clients undergoing hemodialysis at Gambiran Hospital Kediri and met the criteria of the sample at the time of the research with purposive sampling technique which was divided into 11 treatment groups and 11 control groups. Mann Whitney test results obtained $p = 0.004$. The result showed that there was difference of sleep quality between those of the treatment groups and those of the control groups after LPD treatment, while Mann Whitney test result on sub variable of sleep quality only on subjective sleep quality showed there was difference between groups with $p = 0,024$. Based on the results of the study, the hospital, especially nurse staff, began to identify the problem of sleep disorders in clients with CKD with PSQI questionnaires and provide appropriate education issues of sleep disorders experienced by clients, and it can be suggested that the use of modification of self-freedom (self-submission) exercise as a companion therapy was effective to improve patient sleep quality CKD.

Keywords : Sleep quality, CKD, modification of self-freedom (self-submission) exercise

Introduction

Chronic kidney disease has become a public health problem throughout the world. The prevalence of ESRD cases in Iran was 700,000 in 2004, and the incidence rate was 173 per 100,000 people. This condition increases the risk of patient morbidity and mortality and places major economic pressure on the health care system (1). Sleep disturbance is very common among ESRD patients who receive long-term dialysis. The prevalence of sleep disorders in hemodialysis patients is estimated to be 50-80%, which is relatively higher than non-dialysis patients (2). Previous studies have reported a potential correlation between insomnia, poor sleep quality and sleep disturbance with reduced quality of life and increased mortality in hemodialysis patients (3,4). Insomnia, restless legs syndrome (RLS), sleep apnea and excessive daytime sleepiness (EDS) are the most common sleep disorders among patients with chronic kidney disease (2).

Poor sleep quality affects many hemodialysis patients and predicts morbidity, mortality, quality of life, and patterns of drug use (4). The prevalence of poor sleep, including waking and breathing problems during sleep and deep sleep, is within the range of 45-80% (5). Several studies conducted in the last 20 years have shown a high percentage of sleep disorders (6). Similar to the general population, increased stress, anxiety, depression, and anxiety are associated with poor sleep quality in dialysis patients. Furthermore, it has a negative impact on the immune response and can lead to the development of cardiovascular disease which is the first cause of death in all patients with kidney disease (1).

There are various approaches to assessing a person's sleep quality, one of which uses the items of approach from the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The PSQI questionnaire is

very useful in identifying whether a person has good sleep quality or poor sleep quality (7). The psychometric properties of PSQI have been examined and found to be suitable for populations in good health and illness (8). Broadly speaking, PSQI uses a 19-item self-report questionnaire that measures sleep disturbance. Seven domains showing sleep difficulties were clinically assessed by PSQI. This sleep domain is assessed as a single factor called Sleep Quality (SQ). Domains causing sleep disorders are subjective sleep quality, time required to start sleep (sleep latency), length of sleep (sleep duration), sleep efficiency (habitual sleep efficiency), sleep disorders often experienced at night day (sleep disturbance), medication to help sleep (sleep medication), and sleep disorders often experienced during the day (daytime disfunction).

Management of poor sleep disorders can be divided into two, namely pharmacological and non pharmacological. Non-pharmacological treatment, according to Woolfolk (9), in overcoming sleep disorders is the relaxation method. Self-freedom (Self-submission) exercises consist of a combination of relaxed position (tense-relax muscle) in a lying down position or sitting with breathing arrangements (3 step breath), and it is a method of short relaxation that can be done anywhere, anytime, anywhere, easily, and in a relatively short time.

In the self-freedom (sel-submission) exercises, some modifications are made related to respiration considerations, namely breathing movement repetition adjusted from 24 times to 10 times, long holding breath for 10-20 seconds until the third breathing is adjusted to hold the breath immediately then exhaled slowly, and finally in the final session where when opening the eyes the last breath there is a countdown of 10 to 1 adjusted to be open eyes while exhaling slowly without any countdown. Modifications made in such self freedom (self-submission) exercises are based on the

results of analysis related to complications related to CKD patients such as pulmonary edema, pleural effusion, clinical manifestations of fibrinous pleuritis and sleep apnea are important to consider in the application of self-submission in hemodialysis CKD patients with sleep problems experienced. Nurses need to pay attention to respiratory manifestations due to fluid overload volume and acidosis metabolism. The presence of metabolic acidosis increases hardening of the arteries and worsens the acidemia associated with permissive hyperkalemia, due to low volume ventilation, and substantially lung ventilation increases survival in ALI (Acute Lung Injury) and ARDS, and its use should not be abandoned in dealing with kidney failure (10).

Materials and Method

The research method used was quasi experiment with pre and post tests with a control group design. This research was conducted at the Hemodialysis Hospital Installation using a purposive sampling technique with a sample of 22 respondents. The data collection was in the form of PSQI questionnaire pre-test to identify respondents experiencing sleep quality problems. Modifications of self-submission exercises were given to the treatment group for 18 days with a dosage of 2 (two) times a day, while the control group only received basic medical treatment from the hospital.

Research Results

Table 1. Results of Analysis of Sleep Quality Indicators according to PSQI

Sleep quality indicators by PSQI	Treatment group	Control group	Both groups
Subjective sleep quality	p=0.083 (wilcoxon Signed Ranked Test)	p=1(wilcoxon Signed Ranked Test)	p=0.024 (Mann Whitney)
Sleep latency	p=0.317 (wilcoxon Signed Ranked Test)	p=1(wilcoxon Signed Ranked Test)	p=0.080 (Mann Whitney)
Sleep duration	p=0.004 (paired t-test)	-	p=0.213 (Independent t-test)
Sleep efficiency	p=0.000 (paired t-test)	p=1(wilcoxon Signed Ranked Test)	p=0.102 (Mann Whitney)
Sleep disorders	p=0.341 (paired t-test)	p=0.341 (paired t-test)	p=0.126 (Independent t-test)
Daytime disfunction	p=0.157 (wilcoxon Signed Ranked Test)	p=1(wilcoxon Signed Ranked Test)	p=0.635 (Mann Whitney)
Use of sleeping drugs	-	-	-

Table 2. Results of Analysis of Total Scores of the PSQI Questionnaire

PSQI Scores	p=0.004 (wilcoxon Signed Ranked Test)	p=0.341 (paired t-test)	p=0.004 (Mann Whitney)
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Discussion

The results showed there were differences in the quality of sleep in CKD patients undergoing hemodialysis with modification of self-submission exercises compared to that experienced by the control group. The results of the study were supported by several previous studies in Wuryanto's study in the sleep quality of chronic renal failure groups with depressive symptoms. There were differences in PSQI scores in the LPD group before and after treatment showing statistically significant results (11). In Suastawa Research (12) in the obstructive pulmonary disease group with depressive symptoms with a PSQI score there was a difference in the PSQI score before and after the treatment of self submission exercises.

Modification of self-submission exercises done regularly provided a significant improvement in the sleep quality. The relaxation responses caused by modification of self-submission exercises might improve the patient's sleep quality. Sleep duration and sleep efficiency are the most important factors in good sleep quality (13). According to the National Institute of Health (NIH) one form of complementary therapy is mindbody techniques (National Institutes of Health 2008). Dhikr therapy is included in nonpharmacological therapy, that is by praying, prayer is one type of mind body intervention (14). Dhikr was chosen because the recitation of words believed to have more effect on the body, reading words over and over again (for example, the dzikir sentence) has the same therapeutic benefits as a relaxation exercise (15).

The state of relaxation, activating the sympathetic nerves makes the clients unable to relax or relax so that it can not cause drowsiness. Client relaxation exercises are trained so as to be able to

bring up the relaxation response, then a state of calm is achieved. The relaxation response occurs through a significant reduction of oxygen demand by the body, which then blood flow becomes smooth, tranquilizing neurotransmitters are released, the nervous system works properly, the relaxed muscles of the body causes a feeling of calm and comfort.

Research with the theme of yoga as an intervention to improve sleep quality and quality of life has been widely carried out. A pilot study conducted in Taiwan in 2010 showed that yoga provides improved sleep quality (13). Yoga encompasses a variety of practices, including physical exercises, breathing exercises and relaxation meditation exercises. Research has shown that yoga provides various benefits for physical and mental health, including stress reduction, anxiety, depression, somatic and mental hyperarousal. This condition has been found to be strongly associated with insomnia. Therefore, this study raised the hypothesis that yoga interventions are beneficial in reducing insomnia in this case in adult and geriatric populations.

The modification of the self-submission exercises which are complementary interventions in which there is a relaxation and spiritual approach can improve the quality of sleep in patients with CKD with routine and patient readiness for this intervention (16-22).

Conclusion

The conclusion of the study is that there are differences in sleep quality in CKD patients undergoing hemodialysis with the treatment by the modification of self-submission exercise compared to that experienced by the control group.

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