

ORIGINAL ARTICLE

The Effects of Massage Therapy on Sleep Quality of Patients with End-Stage Renal Disease Undergoing Hemodialysis

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ABSTRACT

Sleep disorder is one of the important problems in hemodialysis patients (HPs) that could decrease their life quality. Nowadays, increasing health level of HPs is an important issue regards the flourish statistics of these patients. Some studies have shown that massage therapy reduces back pain, obviate insomnia, make calmness and raise health in HPs due to the release of endorphins. This research was conducted to determine the effects of foot massage on nightly sleep quality of HPs. This experimental study was carried out on 80 HPs in Dialysis units of Shohada and Shahid Rahimi hospitals in Khorramabad, West of Iran during 2015. The instruments used included Pittsburg questionnaire and sleep log form. The sleep status of patients who have problems with their sleep was investigated according to the instruments before and after the intervention (foot massage). Foot massage was performed for 10 minutes during the dialysis, three times a week for 4 consecutive weeks. Changes in Pittsburg score showed that foot massage was effective in sleep quality of experimental groups and Freedman statistical exam showed that nightly sleep duration increased and generally with repeating the intervention, the sleep status of patients became better per week compared to the previous week ($P < 0.001$). Concerning the results of present research, it can be concluded that foot massage has a desirable effect on sleep quality of HPs and can be executed and trained as a useful way to improve the sleep quality of patients in hemodialysis unit.

Keywords: Foot Massage, Sleep disorders, Hemodialysis patients, Palliative care

INTRODUCTION

Hemodialysis is considered as a major kidney substitution treatment in patients with chronic renal failure who experience a spectrum of physical, psychosocial and

economical disorders (Kasper et al., 2009). Although hemodialysis helps these patients to increase hope in life, it couldn't help to resolve all physical and mental problems of patients. Also, evidences show that renal failure patients undergoing hemodialysis suffer from several problems such as sleep disorders with a prevalence of 20 to 80 percent (Tsay et al., 2003). Recent studies showed that there is a relationship between sleep deprivations, deficient sleep, and generally sleep disorders, low life quality and enhanced risk of death in hemodialysis patients (HPs) (Mohammadi and Broomand, 2007). Insomnia has a major effect on people's life quality and decreases their life efficiency in hence of emotional,

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social and physical aspects (Drake et al., 2003).

Concerning undesirable effects of sleep disorders, nurses of intensive care units including dialysis unit should ascertain that their patients have enough sleep and rest as a care duty then identify sleep disorder factors in HPs and use effective and relaxing methods to raise sleep quality of these patients (Saeedi et al., 2012). Chronic insomnia is a dangerous factors in car accidents, occupational hits caused by fatigue, occupation lose and etc. Therefore, sleep quality improvement play an effective role in preventing risk factors, raising immunity and improving socio-family performance (Schenck et al., 2003). Different medicine and non-medicine methods have been used to improve the sleep quality of HPs (Grzywacz et al., 2005). Although medications help to improve some indices of sleep quality in these patients, various degrees of side effects have been reported for these drugs and even in the study by Foley et al. stated that barbiturates leading to severe insomnia in hemodialysis patients is 50% of cases (Foley et al., 1995). Complementary medicine (such as Acupressure, Acupuncture, Aromatherapy, Reflexology, Relaxation) is one of non-medicine ways to resolve sleep disorders. Approximately 1.6 million of the American populations used this method and the results showed that 60 to 70% of the sleep disorders of non-medicine users were resolved. Therefore, it seems that the use of safe and secure methods are necessary to decrease the sleep disorders. Massage therapy is one of these non-medicine methods to which resolve the sleep disorders and also increase blood circulation, relieve stress, help the digestive system and its performance, stimulate the lymphatic system, improve the function of the autonomic nervous system, decrease heart rate and blood pressure, causes the secretion of endorphins and thus reduce back pain, insomnia and calm the patients (Stuart and Cherry, 2016). Massage can also be effective in balancing nervous system, and amending physical balance. The skin and muscles contain huge nerve connections. Therefore, the gentle massage by nerves causes the relief and recovery of health in any part of the body. This performed through gentle pressure and then releasing the muscles and blood vessels (Corbin, 2005). The foot contains thousands of nerve endings that reflects the connection to the rest

of the body. So when given a foot massage, the whole body is affected. For this reason, many massage therapists who do not have enough time for a total body massage, focused on the foot massage (Azami et al., 2015).

Since the further investigation into the effects of massage has been done on patients of non-HPs and with techniques such as Swedish massage and reflexology technique and on the other hand foot massage has been less studied as unique, safe and economic method to improve the quality of night sleep in HPs and also given that in some studies, the effect of foot massage on sleep quality have suggested due to easy access to the legs during hemodialysis, so this study was conducted to aware the nurses of intensive care units concerning the effect of foot massage on patient's health and also to determine the effect of foot massage on improving the night sleep quality of HPs.

MATERIALS AND METHODS

Design and patients

The current study is an experimental clinical trial that investigates the sleep status of HPs before and after doing the intervention (foot massage). In the present study, 80 patients were selected from the dialysis units of Shohada and Shahid Rahimi hospitals in Khorramabad, Western Iran during 2015. These patients has features such as; desire to participate in the study, giving written informed consent, having sleeping problems on the basis of Pittsburgh questionnaire, being hemodialysis in the evening and night shifts, lack of amputations, fractures, infections, wounds and skin disease in the lower extremities and older than 18 and younger than 65 years and were divided randomly into two groups of 40 experimental and control groups. The effects of age and gender as confounding variables were removed in the patients of both groups through the stratified randomization method. The presence of a therapist and face to face communication as the study limitations may be affect the results. As well as, the genetic factors may also interfere with the effectiveness of massage. In addition, the age, emotional and personality status are different and may influence the effect of massage.

Therefore, to control the limitations, very young and very old people were omitted and only the patients aged between 18 and 65 years were participated. The Pittsburg questionnaire filled for all the participants before the intervention.

Intervention procedure

Intervention was as stroke foot massage in metatarsus, from heel to the fingertip for 5 min for each foot (totally 10 minutes) during the dialysis. This process was performed 3 times per week during 4 consecutive weeks by researcher in the evening and night shifts (because of closeness to nightly sleep). The stroke massage process was done as follow: At first the hands of researcher becomes warm with body oil and a mild to moderate pressure comes slowly and regularly without any changes. In stroke technique, the pressure carried out by all parts of palm and could be pressed in all direction from above to below, vice versa or as a transverse (Holey, 1997). 4 weeks after the first massage session, the Pittsburg questionnaire filled again to investigate the sleep status of HPs in both control and experimental groups. The control group did not receive any intervention from the researcher for their sleep disorders.

Data collection and measurements

The instruments for data collection in this research included demographic information form, Pittsburg sleep quality index and sleep log. Pittsburg sleep quality questionnaire has 9 questions that investigate the sleep quality in 7 scopes. These 7 scopes includes sleep quality, delays in falling asleep, real sleep duration, sleep adequacy, sleep disorder, using hypnotic medicine and daily function disorder. Each scope has 3 points and the total score was 21. Each patients that receive above 5score, has low sleep quality. The validity and reliability of Pittsburg standard questionnaire was investigated in different study. It has 0.83 Cronbach's alpha coefficient for 7 domains and the validity of this questionnaire was verified for Iranian population by Farhadinasab and Azimi (2008). On the other hand, Farrahi et al. (2009) achieved a sensitivity of 100 %, specificity of 93% and Cronbach's alpha coefficient of 0.89 % for Persian copy of the

questionnaire. Sleep log has 7 questions that investigate the sleep quality during the day and night. To investigate the sleep improvement process in HPs, the question of sleep log was asked before and after the intervention. The validity of sleep log was verified by Nasiri et al. (2007) and Arab et al. (2012) for Iranian population.

Data analysis

Data were analyzed using SPSS Ver.15 software. To assess the effects of massage on sleep problems, the descriptive statistics, paired sample t-test and non-parametric equivalence were used. For comparison the Pittsburg score before and after the intervention among the two case and control groups, the Wilcoxon test was used. As well to compare the sleep chart questions in both case and control groups during the four weeks (four measurements) the Friedman test was applied. This study was approved by the School of Nursing and Midwifery Ethical Committee of the Lorestan University of Medical Sciences, Khorramabad, Iran (Ref. No. 200.1541.2015). All participants provided informed and written consent.

RESULTS

Demographic variables of participants

In the present study, results showed that 5% of participants were fewer than 30, 18.8% between 30 and 49 and 66.3% were over 50 years old. 66.3 % of patients in each group were male. 47.5% of patients were illiterate and more than 9% of them had academic educations. 70% of patients were on dialysis three times a week. Also, 87.5% of the experimental and 92.5% of control groups did not have any study before sleeping.

Intervention impact measurement

Results indicated that night sleep duration of HPs improve in previous and after intervention. General points were decrease in experimental group. However, the average and total points didn't decrease in control group. The comparison of average and Pittsburg standard deviation score before and after the intervention are shown in Table 1. Moreover, the information of sleep log showed that nightly sleep was increased and based on

Table 1: Comparison of the mean and standard deviation (sd) of Pittsburgh, before and after the intervention (foot massage) in experimental and control groups.

Component of sleep quality index	Experimental group				P Value	Control group				P Value
	Before intervention		After intervention			Before intervention		After intervention		
	Mean	SD*	Mean	SD		Mean	SD	Mean	SD	
Subjective sleep quality	2.09	0.78	1.03	0.65	0.00	1.84	0.82	1.94	0.82	0.257
Delayed sleep	2.28	0.89	1.13	0.66	0.00	2.23	0.84	2.30	1.11	0.096
Sleep duration	2.13	0.90	1.09	0.64	0.00	1.90	1.04	2.06	1.00	0.059
Sleep efficiency	2.38	0.91	1.19	0.64	0.00	2.00	1.06	2.81	1.19	0.058
Sleep disorder	1.16	0.57	0.78	0.49	0.003	1.26	0.63	1.39	0.60	0.317
Taking hypnotics	0.47	0.98	0.48	0.71	0.257	0.48	1.00	0.65	0.88	0.132
Daily function	1.28	0.81	0.62	0.55	0.00	1.23	0.80	1.32	0.70	0.317
General	11.79	3.13	6.32	1.93	0.00	10.94	4.10	12.47	3.94	0.500

*SD: Standard deviation

Freedman statistical exam, the sleep status of patients was generally increased in every week in comparison to the last week ($P < 0.001$).

DISCUSSION

Based on the obtained results there was statistically significant relationship between the sleep quality before and after the intervention ($P < 0.001$). In other words, foot massage was effective for the sleep quality improvements. This research showed that nightly short-time foot massage could be useful for sleep disorders and resolve some problems such as sleep difficulty and short nightly sleep duration. Many researches carried out to investigate the effective factors on sleep disorders and its effective treatment. Ejindu (2007) investigated the effects of foot and face massage on sleep, blood pressure, breath and pulse rates. The intervention was performed through 20 minutes massage of face and 10 minutes massage of each foot with peach kernel oil. The result showed that massage gives a sleep status to the patients and some of patients asleep during the massage and the others were sleepy.

Field et al. (2007) compared the effects of massage therapy on back pain and sleep disorders in two groups which received massage therapy and relaxation. Two 30-minute massage sessions per week for 5 weeks was performed using body oil. Knee and back massage in a lying position on the abdomen and then massage the

neck, abdomen, torso, thighs and knees were performed in the supine position. The results showed that back pain and sleep disorders were significantly decreased in patients with massage therapy compared to the patients which received relaxation. The findings of the study of Imani and colleagues (2009) showed that in the experimental group the Pittsburgh questionnaire score was significantly decreased and 10-minute foot massage improve sleep quality in HPs. The findings of this study revealed that the amount of time it takes a person to sleep or after waking from sleep, to sleep again, significantly decreased in the nights after the intervention. Russel (2007) performed a case study to investigate the effects of massage therapy on a 35 years old married woman who experienced the Restless legs syndrome for 23 years. 45 minutes massage was performed for 3 weeks lying in the belly and on the back. The effects of massage on the number of hours of sleep, waking up frequently, symptoms and severity of Restless legs syndrome was measured and it was found that massage is progressively improved the sleep quality and people feel more relaxed and can better perform tasks relating to daily life.

The findings showed that, despite a lot of sleep disturbances among hemodialysis patients, the intervention could improve their sleep status by using economic and safe methods. Teaching these methods to the patients and their families are very simple and increased comfort and quality of life.

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