

# The Effect of Thai Massages on General Health of Hemodialysis Patients: A Randomized Controlled Clinical Trial

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## Abstract

**Aims:** The purpose of this study was to determine the effectiveness of Thai massages on the general health of hemodialysis (HD) patients. **Materials and Methods:** In this clinical trial, 80 patients undergoing HD were randomly assigned to intervention and control groups. Before study, the two groups completed sociodemographic and general health questionnaire (GHQ-28) questionnaires. The control group received routine care for HD patients. In the intervention group, 60-min Thai massages were performed three times a week for 4 weeks. Immediately and 1 month after the last session of the intervention, the GHQ-28 questionnaire was completed by the two groups. **Findings:** There was no significant difference between the mean scores of general health in the two groups before the intervention ( $P > 0.05$ ). But, immediately after and 1 month after the last session of the intervention, there were significant differences between the two groups in the total scores of general health and the scores of physical symptoms and anxiety subscales ( $P < 0.05$ ). In the intervention group, the repeated measures ANOVA test showed significant differences between the total scores of general health as well as physical symptoms and anxiety subscales over time ( $P < 0.001$ ). **Conclusion:** A Thai massage can be considered as an effective alternative for improving HD patients' general health as well as reducing physical symptoms and anxiety.

**Keywords:** General health, hemodialysis, Thai massages

## INTRODUCTION

Hemodialysis (HD) is universally used as a long-term treatment for patients with chronic renal failure.<sup>[1]</sup> Increased prevalence of hypertension and diabetes mellitus in Iran are the most important causes of the end-stage renal disease (ESRD) and HD.<sup>[2]</sup> In Iran, about 50% of the ESRD patients are treated with HD and the rest are undergo kidney transplantation and peritoneal dialysis.<sup>[3]</sup>

Although HD can help improve the removal of excess fluids and body wastes excess fluids while restoring acid-base balance,<sup>[3]</sup> this treatment is also associated with multiple complications, including anemia as well as gastrointestinal, skin, hemodynamic, and musculoskeletal problems.<sup>[4]</sup> In addition, patients experience different psychological problems,

such as sleep disorders, stress, depression, and anxiety.<sup>[4,5]</sup> These poor health conditions can be associated with chronic renal failure and treatments related to this disease, such as HD and pharmacological interventions.<sup>[5]</sup> As a result, complementary therapies can be used for the management of health conditions associated with HD.<sup>[6]</sup>

Studies showed that the rate of using complementary therapies increased from 10%–39% in 1997 to 37%–73% in 2020.<sup>[7,8]</sup> Complementary and alternative therapies have lower rates of adverse effects and complications compared to pharmacological and conventional medical interventions.<sup>[8]</sup> In

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addition, in Iran, complementary and alternative therapies are more convenient, safe, and cost-effective compared to other medical interventions.<sup>[5]</sup>

Among a variety of complementary and alternative therapies, massage therapy is emphasized for managing symptoms related to HD.<sup>[8]</sup> Massage therapy includes using pressure, rubbing, and kneading on the soft body tissues with adjustable levels of intensity, directions, rates, and rhythms.<sup>[9]</sup> Thai massage is a popular intervention among the traditional Thai medicine.<sup>[10]</sup> Thai massage is a method of deep-pressure massage that includes sustained compression on the target muscles and passive stretches of the muscles by a therapist.<sup>[9,10]</sup> Using body weight, the Thai massage therapist applies the thumb on the patient's body along energy lines called "Sen Sib." With this method, the therapist applies passive stretches on the target muscles at the end of sessions.<sup>[10]</sup> Thai massage is often performed on a floor mat while the patient is fully dressed.<sup>[9,10]</sup>

A study indicated that Thai massages can remove toxins from muscle mass, improve the depth of breathing and relaxation, relax tendons, relieve muscle tension, and enhance muscle elasticity in patients with low back pain.<sup>[11]</sup> Moreover, another study reported that Thai massages can help improve patients' physical and mental status, blood circulation, range of motion, and decrease pain and muscle tightness and muscle flexibility in patients with several musculoskeletal disorders.<sup>[12]</sup> Although the use of Thai massage to manage multiple health conditions has been practiced in Thailand for a long time, there is a need for careful research studies to confirm the effectiveness of this method for managing health conditions among patients.<sup>[11,12]</sup>

Several research teams have studied the effects of this intervention method among different populations. A study showed that a 30-min Thai message twice a week for 4 weeks is effective for the reduction of disability and pain in patients with chronic, lower back pain.<sup>[11]</sup> Another study indicated that benefits of Thai massages regarding pain reduction lasted up to 15 weeks among patients with chronic pain.<sup>[13]</sup> In other study, three 30-min sessions of Thai massages for 10 days could help improve physical performance in soccer players.<sup>[14]</sup> A study showed that 10-session Thai massages are effective to improve general health in cancer patients.<sup>[15]</sup>

Due to the chronic nature of HD and the existence of various physical and psychological complications in them, as well as the existence of contradictory studies on the effect of massage on the general health of these patients and the lack of studies on the use of Thai massage in these patients, researchers decided to do this study. The purpose of the present study was to determine the effect of Thai massages on general health of HD patients.

## MATERIALS AND METHODS

This study was a randomized single-blinded clinical trial. This study was performed on 80 HD patients referred to the HD Center in Kashan, Iran, from September to November 2020. In each group, the sample size was

calculated based on Bullen *et al.*'s study<sup>[16]</sup> and assumptions,  $\sigma_1^2 = \sigma_2^2$ ,  $\alpha = 0.05$ ,  $\beta = 0.2$ ,  $d = 0.65$ . According to the formula, 37 participants were determined in each group. Considering 10% of the sample loss, 40 participants were considered for each group.

The patients were randomly assigned into intervention ( $n = 40$ ) and control ( $n = 40$ ) groups using the block randomization method (4 block of 10) by an online software. Over the course of the study, in the intervention group, four patients were excluded from the study due to a change in their health condition: death (one patient), exacerbation of the patient's condition to an acute state (one patient), and a lack of the patient's cooperation in performing massages (two patients). Moreover, during the study, three participants in the control group were excluded from the study due to an inaccurate completion of the questionnaires [Figure 1].

Inclusion criteria for the participants included ages of 18–60 years; willingness to participate in the study; no amputations, fractures, infections, wounds, or skin diseases in the limbs; having three sessions of 3–4-h HD/week; having a history of at least 3 months of HD; and an ability to complete the informed consent form. Exclusion criteria included absence from at least two sessions of massage therapy; exacerbation of the patient's symptoms during the study; and a simultaneous use of other complementary therapies, such as laser therapy, music therapy, motion therapy, and hydrotherapy.

At the beginning of the study, the participants in the two groups completed two questionnaires included sociodemographic questionnaire (age, gender, level of education, marital status, and history of HD) and general health questionnaire-28 (GHQ-28). The GHQ-28 was designed by Goldberg and Hillier in 1979.<sup>[17]</sup> The GHQ-28 consists of 28 items and four subscales (physical symptoms, social function, anxiety, and depression). Each subscale has seven questions. Each question has Likert 0 (never) to 3 (always). The total score of the GHQ-28 is between 0 and 84.<sup>[18]</sup> This scale has been psychometric and validated in different populations of the world and Iran.<sup>[19,20]</sup>

The intervention was completed by the first author. In the intervention group, Thai massages were performed 3 times a week for 4 consecutive weeks before the participant's dialysis sessions. In total, 12 sessions of massages were performed. Each session lasted for 60 min. We followed Buttatag *et al.*'s intervention design for performing the intervention in our study.<sup>[21]</sup> Thai massages were performed in a private room at the HD center. The room temperature was set between 21 and 25°C, and the humidity was between 35% and 55%.

In complementary and alternative medicine, energy is an important aspect of care.<sup>[12]</sup> For instance, in acupuncture, yoga, and Thai massages, the related manipulation or intervention is applied on specific points along the energy lines of the body.<sup>[9,10]</sup> With this in mind, we also performed Thai massages based on a standardized protocol and using energy lines.<sup>[10]</sup> Based on a clinical trial, there are two lines or energy chains in each

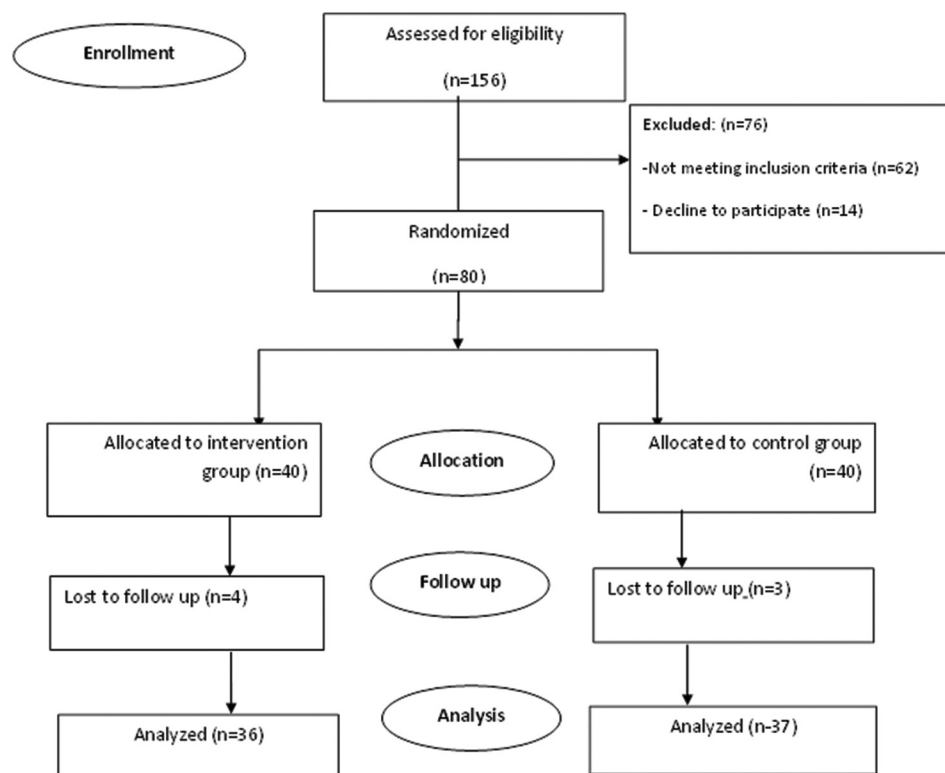


Figure 1: CONSORT flow diagram

hand, four lines in the spine and back, six lines in each foot, and two lines in each leg. These lines are located on the inner and outer surfaces of the limbs.<sup>[9,10]</sup>

Initially, using the therapist’s palms and thumbs, pressure was applied on the participant’s plantar muscles along the 6 energy lines of each foot for 10 min (5 min/foot).<sup>[10,21]</sup> Second, by squeezing the femoral artery to stop blood flow to the legs and then releasing the pressure, the blood could return to the legs. Then, the pressure was applied with the therapist’s heel of the hand along the energy lines on the inner and outer sides of the thigh. This step was performed for 10 min (5 min/foot). Third, using the thumbs, the therapist performed massages on the external surfaces of the participant’s foot from the top of the ankle to the leg (both sides of the tibia), thigh, and groin for 10 min (5 min/foot). The same procedure was performed for the inner surface of the foot for 10 min (5 min/foot). Fourth, using the thumbs, the researcher applied pressure on both sides of the participant’s spine (lumbar, waist, and upper back up to the shoulder along the energy lines) for 30 min. For the participants with limited mobility and inability to be placed in a supine position, this step was performed in a sitting position.

For the control group, routine care for HD patients was provided. The two groups completed the GHQ-28 questionnaire immediately after the last session and 1 month after the last session of the intervention. Our participants’ routines and standard care did not include any type of complementary therapy.

The first author performed Thai massages on the intervention group; the first author had a certificate in Thai massages. The data collection was completed by the second author. The second author was unaware of the participants’ group assignment. The statistical specialist was also unaware of the participants’ group assignment.

Descriptive and inferential statistics were used using the Statistical Package for the Social Sciences 16.0 software (SPSS Inc., Chicago, IL, USA). The Shapiro–Wilk test was used to test the normal distribution of data. The Shapiro–Wilk test results showed that the distribution of GHQ-28 was normal. Chi-square tests were used to compare the two groups in terms of nominal variables. The independent *t*-tests were used to compare the two groups’ mean scores. The repeated measures ANOVA test was used to perform within- and between-group comparisons regarding general health scores across three times. The level of significance was set at 0.05.

This study was approved by the Institutional Review Board and the Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (code: IR.KAUMS.NUHEPM.REC.1399.008). The participants were informed about the study’s purposes and methods as well as the voluntary nature of the study. They were ensured the confidentiality of the data and their right to withdraw from the study without penalty. Written informed consent was completed by the participants. This study received the registration number of IRCT20111210008348N43 from the Iranian Registry of Clinical Trials.

## RESULTS

The results showed that the mean ages of the intervention and control group participants were  $54.97 \pm 15.68$  and  $57.51 \pm 14.07$ , respectively. Most of the participants in the intervention group (72.2%) and the control group (67.6%) were female. No significant difference was observed between the two groups in terms of sociodemographic characteristics ( $P > 0.05$ ) [Table 1].

Before the intervention, there was no significant difference between the two groups in general health score and its subscales ( $P = 0.76$ ). The results of the groups comparison showed that immediately after and 1 month after the intervention, differences between the groups' total scores of general health and physical symptoms and anxiety subscales were significant ( $P < 0.05$ ). Two groups had no significant differences in depression and social dysfunction subscales. The repeated measures ANOVA test in the intervention group showed a significant difference between the total scores of general health and physical symptoms and anxiety subscales over time ( $P < 0.001$ ) [Table 2]. However, in this group, there was no significant difference between the scores of social dysfunction and depression subscales over time.

## DISCUSSION

In this study, we examined the effects of Thai massages on a sample of patients undergoing HD. Our findings showed that between the intervention and control groups, there were significant differences in terms of the total scores of general health, physical symptoms, and anxiety subscales immediately after and 1 month after the intervention. In the intervention group, the total scores of general health as well as the scores of physical symptoms and anxiety subscales were significantly different over time. Our findings were in line with the results of other studies regarding the effectiveness of massage on the subscales of general health, including physical symptoms and

anxiety.<sup>[5,21]</sup> Several studies agreed with our findings in terms of the significance of Thai massages in improving health status of different populations.<sup>[12-15]</sup> However, there were studies that showed no significant effect of massages on different populations, including HD patients.<sup>[22,23]</sup>

A clinical trial showed the effectiveness of the intradialytic massage on physical symptoms and leg cramps in HD patients.<sup>[24]</sup> Another clinical trial showed that 10-min massages with oil twice a week for 3 weeks was effective in reducing physical symptoms regarding HD patients' restless legs syndrome.<sup>[25]</sup> A study reported that aromatherapy massages with oil were not effective in reducing students' anxiety.<sup>[26]</sup> However, our findings indicated that massages were effective in reducing anxiety among a sample of HD patients.

The results of the present study showed that Thai massages had no effect on the scores of depression in HD patients. However, a clinical trial reported the use of foot massage on HD patients. Their intervention included massages 3 days a week for 4 weeks, which started 1 h after the beginning of a HD session. They reported that a massage was effective in reducing depression in HD patients.<sup>[27]</sup> This study had some differences with our research in terms of the type and duration of massage. The results of the present study showed that Thai massages increased the overall score of general health in HD patients. The results of a study showed the effectiveness of massage therapy on general health and quality of life of HD patients,<sup>[28]</sup> which is consistent with the present study. Other studies have also shown that massage therapy increased the overall scores of general health and its dimensions.<sup>[29,30]</sup> The reason for the differences in the results of the two studies can be associated with study designs, such as a short duration of the intervention and the nature of the disease.

The contradictory results among the studies may be due to methodological limitations of the studies or differences among their massage designs. The differences among massage designs may include the number of massage sessions, type of massage, session duration, intervals between sessions, and execution of the movements. A consideration of these factors would be valuable in designing future studies.

We could not control some confounding factors, such as medications and routine treatments for HD patients, which can influence the participants' general health. However, the randomized method of the study may reduce the effects of these factors. To confirm the results of the present study, we recommend further studies on the effects of Thai massage on the health status of HD patients.

## CONCLUSION

According to the findings, a Thai massage can be considered as an effective intervention for improving HD patients' general health, physical symptoms, and anxiety. Due to the cost-effectiveness and safety of this method, we propose the inclusion of this intervention in the treatment protocol for

**Table 1: The intervention and control groups' sociodemographic characteristics**

Variable	Groups		P
	Intervention Group (n=36)	Control Group (n=37)	
Age (years), mean±SD	54.97±15.68	57.51±14.07	0.27*
History of hemodialysis (years), mean±SD	4.20±2.74	4.02±2.60	0.36*
Gender, n (%)			
Female	26 (72.2)	25 (67.6)	0.66**
Male	10 (27.8)	12 (32.4)	
Education level, n (%)			
Elementary	25 (69.4)	29 (78.3)	0.90**
Higher than elementary	11 (30.6)	8 (21.7)	
Marital status, n (%)			
Single	9 (25)	12 (32.4)	0.75**
Married	27 (75)	25 (67.6)	

\*Independent t-test, \*\*Chi-Square test. SD: Standard deviation

**Table 2: Comparison of mean scores of general health in three time in the two groups**

General health dimensions	Group	Mean±SD*			P**		
		Before	Immediately after	1 month after	Time	Time*Group	Group
Physical symptoms	Intervention	7.63±4.02	4.32±3.32	4.89±2.66	<0.001	<0.001	<0.001
	Control	7.21±3.57	7.28±3.79	7.37±3.57			
	<i>t</i> -test***	<i>t</i> =0.62	<i>P</i> =0.001	<i>P</i> =0.001			
Anxiety	Intervention	6.75±4.69	4.35±2.89	4.88±3.48	<0.001	<0.001	<0.001
	Control	8.29±4.24	7.58±4.13	8.02±4.38			
	<i>t</i> -test***	<i>P</i> =0.15	<i>P</i> =0.00	<i>P</i> =0.00			
Social dysfunction	Intervention	14.11±3.73	13.60±3.91	14.25±2.25	>0.05	>0.05	>0.05
	Control	14.47±3.76	14.50±3.19	15.34±2.70			
	<i>t</i> -test***	<i>P</i> =0.67	<i>P</i> =0.28	<i>P</i> =0.15			
Depression	Intervention	4.66±5.52	4.82±4.08	5.25±4.25	>0.05	>0.05	>0.05
	Control	4.60±4.17	4.87±4.54	4.53±4.67			
	<i>t</i> -test***	<i>P</i> =0.68	<i>P</i> =0.69	<i>P</i> =0.81			
Total score of general health	Intervention	33.16±13.93	26.08±9.40	28.0±11.11	<0.001	<0.001	<0.001
	Control	34.08±12.94	34.07±12.70	35.39±12.33			
	<i>t</i> -test***	<i>P</i> =0.76	<i>P</i> =0.003	<i>P</i> =0.009			

\*Continuous data are presented using means±SD, \*\*Repeated measure ANOVA, \*\*\*Independent samples student's *t*-test. SD: Standard deviation

HD patients. Further studies are recommended to confirm the results of the present study.

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### Conflicts of interest

There are no conflicts of interest.

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