



The effect of acupressure on sleep quality in patients with chronic heart failure

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ABSTRACT

Background: Sleep disorder is one of the most common problems in patients with chronic heart failure. Acupressure is considered as a proposed complementary therapy and has proven effective in a wide range of ailments, including pain relief, arthritis and stress. This study attempts to investigate the effect of acupressure on sleep quality in patients with chronic heart failure.

Methods: This is a double-blind, placebo-controlled clinical study, in which 90 patients with chronic heart failure admitted to the heart ward at 22 Bahman Hospital, Neyshabour, in 2014 were selected via inclusion criteria, and then were randomly divided into three groups of acupressure, pseudo and control.

In the acupressure point, massage was performed for three days on the Shen Men point of each of the wrists for 5 minutes, while it was performed in the same way but in 1 to 1.5 cm away from the main point. The control group only received routine care. In this study, data collection tools were a demographic questionnaire and the St Mary's Hospital Sleep Questionnaire (SMHSQ). Sleep quality was measured in all the three groups at nights. Data was analyzed using SAS software.

Results: The results of data analysis showed that the patients were homogenous in terms of demographic information. However, there were significant differences in the sleep quality score between the acupressure and pseudo points groups through five measurement stages ($P < 0.01$), while no significant changes were observed in the control group ($P > 0.05$). Moreover, at the end of the intervention, there was a significant difference in terms of sleep quality between all the three groups ($P < 0.001$).

Conclusion: This study suggests that acupressure promotes sleep quality in chronic heart failure patients and therefore, it can be recommended as a non-invasive treatment for sleep disorders of patients.

Introduction

The importance of sleep in health and disease has been considered since the time of Hippocrates, and disturbed sleep is concerned as a leading cause for human suffering at any age. Humans spend one-quarter to one-third of their lives in sleep (1, 2).

In many texts, sleep is considered as a dimension of quality of life (QOL) (3). Night insomnia can affect QOL, both physically and mentally (4). In other words, the quality of sleep is a clinical concept, which influences QOL (5).

Nowadays, the prevalence of cardiovascular diseases among various societies is undeniable, in a

way that 25% of the United States population suffer from cardiovascular diseases (6). Additionally, it is expected that by 2020, 40% of all deaths worldwide are caused by such diseases (7).

In Iran, the most common cause of death is cardiovascular disease (8). According to UNISEF reports, this disorder caused 41.3% of all deaths occurred in 2005 in Iran, which is predicted to reach 44.8% by 2030 (9).

Heart failure is one of the most prevalent cardiovascular progressing chronic disorders. Thus, various symptoms and intensity of the disease are a threat to patients. Such patients have a sense of approaching death. This feeling induces tension, anxiety and stress, and consequently, deprives them of a suitable sleep (10).

Parker et al. (2005), Erickson et al. (2003) and Chen and Clark (2007) signified in their studies that patients with heart failure experience much more problems with sleeping compared to individuals with no heart failure (11, 12 & 13).

The progression and symptoms of the disease can be alleviated through reducing the activities and also having enough sleep (14).

Although sleep disorders can be controlled by consuming drugs, due to their side effects, it is more logical to apply non-pharmacological techniques that decrease sleep disorders in cardiovascular patients (15). Emergence of unfavorable effects of consuming drugs such as insomnia over day hours, dizziness, weakness, vertigo, reduction of consciousness level and muscular coordinating system, drug-induced hepatitis caused by drug toxicity and reduction of drug effects after a period of treatment are considered as most important reasons for drug therapy limitation (16).

Moreover, complementary and alternative medicine (CAM) such as acupressure is among effective cures on sleep disorders (17). The CAM approach is increasingly implemented in many countries. According to research findings in Iran, 80% of patients demand the CAM approach by physicians (18).

In Chinese traditional medicine, acupressure is a therapeutic method, non-invasive technique and skill in traditional treatment using fingers to exert pressure on key points of the skin (19).

UNISEF has approved the implementation of acupressure and acupuncture in 100 cases. Acupressure provides the required energy for living and improves sleep disorders by relieving neuro-transmitters and neurohormones (20).

Nowadays, various studies have been

accomplished on the effect of acupressure in dealing with all the problems of patients. Among them, Hossein Abadi et al. (2008) concluded that using acupressure not only improves the quality of sleep, but can also solve this problem in a high speed, enabling patients to experience a normal sleep after 1 or 2 session(s) (21).

Sun et al. (2010) found acupressure of the Shen Men point on hands as an effective method in improving sleep after 2 weeks of intervention (22). Furthermore, Cerrone et al. (2008) made a report on the effect of the Shen Men point on quality of sleep in patients suffering from cancer (23).

Patients with heart failure have to challenge with many clinical affectations related to this disease. These affectations are usually improved by consuming drugs. Sleep disorders are one of the major problems in such patients, which influence cure procedure and their QOL (24). In the case of approving the effectiveness of the acupressure method in improving sleep in patients, it can be applied along with therapeutic drugs.

A thorough review of the literature yielded no research evaluating the effect of acupressure on sleep disorders in patients with chronic heart failure. Thus, concerning the increasing number of cardiovascular patients, and as acupressure is one of the interventions that can be used by doctors, nurses and even patients, this study was performed to specify the effect of acupressure on quality of sleep in patients with chronic heart failure to decrease problems associated with chronic diseases.

Methods

The present study is a double-blind, controlled-clinical trial carried out on 90 patients with chronic heart failure admitted to the heart ward at 22 Bahman Hospital of Neyshabour in 2013.

The required criteria to take part in the study consisted of consenting to participate in the study and signing out the permission form, as well as patients with systolic heart failure and left ventricular ejection fraction (EF) greater than 20% and less than 40%, no lesion in the Shen Men point, no acupressure history, acceptable consciousness as well as hearing and speaking ability to answer the questions, 40 to 65 years old and lack of sensitivity to touch or massage.

The exclusion criteria were unwillingness to participate in the study for any reason, becoming inaccessible for any reason (death, discharge, transfer to another section), consuming drugs 5 to 6 hours before sleeping, and not consuming narcotics (because of interrupting the cure

procedure; consuming 10 milligram oxazepam or a similar dose is excepted).

In this research, the samples were selected in a non-probability sampling based on the inclusion criteria. Then, they were divided into three groups including control, acupressure and pseudo groups. Thirty samples were assigned to each of the groups. The researcher visited the heart section of the hospital every evening, and by examining the admission office and patients' records, selected eligible units based on the inclusion criteria.

In the same day, the SMHSQ questionnaire was completed by the subjects to consider their last night sleep at home. As the patients were probably in an unsustainable condition at the first night of hospitalization, no interruption was made within the three groups (25). The questionnaires were delivered to the patients in order to be filled out in the following morning (7-8 a.m.) by the help of the project assistant.

The assistant was not aware of the type of intervention accomplished on the patients. At the second night of hospitalization, the researcher performed the intervention between 8-10 p.m., generally due to proximity to sleep time.

To this end, the pressure was exerted on every hand in the Shen Men point, and 1.5 cm away from the Shen Men point was measured for 5 minutes in the acupressure and pseudo groups, respectively. These interventions were implemented for three nights. In the control group, however, all the patients received routine actions.

In all the three groups, sleep quality of the samples during hospitalization (to evaluate sleep quality in the house) was considered in the first, second, and third morning of hospitalization within 7-8 a.m. by the project assistant and via the SMHSQ questionnaire.

In this study, the data collection tools included two parts of demographic features and information related disease and the SMHSQ questionnaire. This questionnaire has been designed to evaluate sleep quality in hospitalized patients (25-27).

The SMHSQ questionnaire has been used by Moeini et al. (2010) on patients with ischemic heart disease and by Abo-Alhassani et al. (2005) and Bagheri et al. (2014) on patients hospitalized in CCU wards. In the research of Bagheri et al. (2014), the reliability of the questionnaire was determined to be 80% (25). In the present study, the reliability of the questionnaire was estimated to be 0.84 by applying Cronbach's alpha coefficient.

Repeated measures analysis of variance (ANOVA) by using SAS software was applied to

analyze the research data. In addition, frequency, percentage, average and standard deviation were used to describe the data.

Results

In all the three groups, the proportion of men and women patients was similar (50% for each gender). The average age was 56 ± 5.90 , 56.6 ± 5.77 and 56.5 ± 5.97 in the true acupressure group, pseudo acupressure group, and control group, respectively.

Moreover, 65% of the patients had an EF of 35%, while 1.7% of them had an EF of 25%. According to chi-square and Fischer tests, the results of ANOVA revealed no significant difference in gender demographic features, education, married life, job, hypnotic medication used at home, EF and duration of illness among the three groups ($P > 0.05$).

According to Table 1, the patient in all the three groups had a lower quality of sleep at the first night of hospitalization. As time passed, the quality of sleep improved in the intervention groups, which was statistically significant. However, there was no significant statistical change in the control group.

To compare the sleep quality scores, ANOVA test was used in the true acupressure, pseudo acupressure and control groups in the house, as for the first night of hospitalization and three nights of intervention. This test showed no significant difference in the quality of sleep in the house within the three groups ($p = 0.06$).

The average of the sleep quality score was not significant statistically at the first night of hospitalization between the three groups ($p = 0.298$), while the comparison of the sleep quality scores was significant in the three groups by ANOVA test at all the three intervention nights ($p < 0.001$).

To test for homogeneity of variance, Levene's test was used, and the results indicated that the variance was equivalent for the three groups at all time intervals, except at the first night of intervention ($p = 0.047$).

In order to have a two-by-two comparison, Tamhane test was applied at the first night of intervention, because of unequal variances. However, for the other time intervals, Bonferroni test was used as a result of equality in variances. The two-by-two comparison at the first night of intervention revealed a statistically significant difference in the mean of the sleep quality scores between the pseudo acupressure ($p < 0.001$) and true acupressure groups ($p = 0.01$) with the control group.

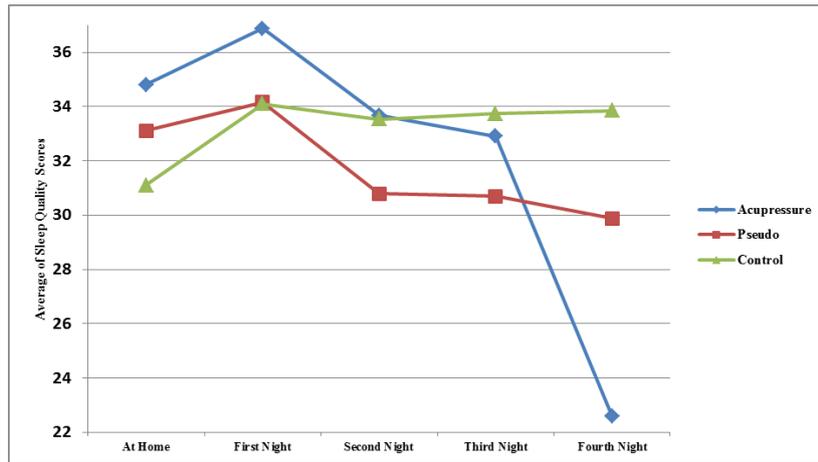


Fig. 1: The procedure of average changes of the sleep quality scores through time. In this table, higher scores refer to lower scores in sleep quality.

At the second night of intervention, there was a significant difference in the average of the sleep quality scores between the pseudo acupressure and control groups ($p=0.004$). Such sleep quality difference was also significant between the true acupressure and control group ($p=0.001$).

At the third night of intervention, a significant difference was observed in sleep quality between the control and true acupressure groups ($p<0.0001$) and also pseudo acupressure ($p<0.0001$), using Bonferroni test. Moreover, this difference was significant in sleep quality between the acupressure and pseudo acupressure groups ($p<0.0001$).

According to the results of sphericity test, the sphericity hypothesis of variances was not approved ($p<0.006$).

The results of Greenhouse geisser test indicated that as time passed, significant difference emerged in sleep quality ($p<0.001$). Furthermore, there was an interactive effect between the time and group ($p=0.01$).

Finally, based on ANOVA test, there was a significant difference in repetitive measures of the sleep quality comparison between the three groups, in a way that a significant improvement was detected in the patients' sleep quality by considering the sleep quality scores relative to the time, interaction time and group ($p=0.001$).

The variance analysis test of repeated measures showed a significant difference in a five-time evaluation in the acupressure group ($p=0.003$) and pseudo method ($p<0.001$).

To have a two-by-two comparison in each of the groups, at the first night of hospitalization and three intervention nights in terms of sleep quality, Bonferroni test as used.

The comparison results indicated significant

difference in the sleep quality scores between the first night of hospitalization and first night of intervention in the pseudo acupressure group ($p=0.023$). It means that this group of patients experienced a better sleep quality after passing the first night of intervention.

In the acupressure group, the patients' sleep quality score obtained at the first night of hospitalization and third night of intervention was significant ($p=0.002$).

In the control group, however, the average of the sleep quality scores before and during the intervention was not significant, and only there was a significant difference between sleep quality at home and at the first night of hospitalization ($p=0.038$).

Moreover, there was no significant difference in nighttime awakenings in house ($p=0.296$) and at the first night hospitalization ($p=0.289$). The numbers of nighttime awakenings significantly decreased in the acupressure and pseudo groups ($p=0.005$), while it revealed no considerable change in the control group within the intervention period ($p=0.573$).

Discussion

The present study showed an improvement in sleep quality after the intervention. The results of this research indicated that although sleep quality of the research units improved after implementing the intervention, as time passed, more obvious improvements were reported in the acupressure group in comparison to the control and pseudo groups.

The results of this study on improving sleep quality after acupressure in the Shen Men point coincided with the results of the study by Bagheri

Nesami et al. (2014), which was carried out with the aim of determining the acupressure effects on sleep quality in acute coronary syndrome (ACS) patients, in a double-blind and bi-group research in points of fengchi, yintong, niguan, yongquan, sanyinjiao, anmion and Shen Men in hands and ears for three nights. However, this study is different from that survey in terms of population, number of groups and acupressure points (25).

Furthermore, the results of this study coincided with the results of the investigation by Hossein Abadi et al. (2007), which was performed in a three-group single-blind way, to explore the effect of acupressure on the elderly in points of fengchi, niguan, yongquan, sanyinjiao, anmion and Shen Men in hands and ears. The mentioned research was carried out in the Kahrizak Charity Foundation (KCF) for three days in a week and in a four-week period. However, some differences exist between that study and the present one such as statistical society, sleep questionnaire, duration of intervention and acupressure points (21).

The results of this study yet coincided with the results of a three group (acupressure, pseudo and control groups) double-blind research conducted by Arab et al. (2013) to determine the effect of acupressure on patients' sleep quality at Imam Reza, Imam Zaman and Hasheminejad Hospitals for three days in four weeks, in which acupressure was performed on patients in the Shen Men point of hands for three times a week for one month (18).

As sleep quality in all the three studied group had an intense drop at the first night of hospitalization, this study also coincided with the study accomplished in 2009 to consider sleep pattern in patients with ACS. In that study, sleep condition was evaluated in 22 patients with ACS qualified for the study for three times (three days, 1.5 months and 6 months after suffering from this disease).

The results indicated that patients suffering from ACS in their first polysomnography had problem in sleep onset and maintenance, sleep quality, sleep duration and other polysomnography features. These cases showed a significant and progressive improvement trend in polysomnography of one month and six months after the initial survey, in a way that tracking the next 6 months revealed that the condition returned to normal sleep.

One of the key points in that study was using poly-somnography method, which is one the most

accurate methods in assessment of sleep. Furthermore, environmental factors and circadian rhythm were controlled in that research (30).

As the data represent, patients in the control group had a reduced sleep quality on the fourth night in the hospital.

Moreover, the results of this study corresponded with the results of the survey carried out on sleep quality and hypnotic drugs effects in adults hospitalized in the internal ward of Ekbatan Hospital in Hamedan. In other words, similar to the mentioned study, hospitalization worsened sleep quality and despite using hypnotic drugs, patients also experienced insomnia and sleep disorder.

In the study of Zeraati et al. (2007), patients in the control group experienced a significantly worse sleep quality at the fourth night of hospitalization compared to sleeping in the house. In contrast with that study, there was no significant difference in sleep quality between the first and last night of hospitalization in the current survey.

In the research of Zeraati et al. (2007), by increasing the length of hospitalization, sleep quality was significantly improved, which was not observed in this study.

According to this study, patients in the acupressure group experienced a more acute drop in the number of overnight insomnia compared to patients in the pseudo and control groups. These results are in accordance with the findings of Chen et al. (2012), Ozgoli et al. (2012), Arab et al. (2013), Bastani et al. (2013), Tsay et al. (2008), Lee et al. (2009), Wang et al. (2008) and Hachul et al. (2013).

Conclusion

We concluded from this study that acupressure is an effective technique that is accepted by patients.

This study showed that acupressure in the Shen Men point of hands can have a therapeutic effect on improvement of sleep quality in patients with chronic heart failure. Therefore, these methods can be taught to patients as well as to nurses who play a vital role in helping patients to identify their sleep disorder.

With regard to the limitations in this study, patients' families as well as social and economic problems affecting sleep quality were among variances, which could not be controlled by the researcher. Moreover, the poly-somnography device could not be provided due to insufficient budget and lack of the researcher's experience to

operate the device; therefore, sleep quality in this study was evaluated subjectively. In addition, mental and physical diseases not diagnosed in the patients might affect the research results. Another limitation was that pre-sleep activities could not be controlled in the patients due to their situation. Furthermore, there were few intervention days, and also due to the disease type and limited criteria, few the samples selected and physical diseases induced in the intervention time could affect the study.

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Reference

1. Kryger MH, Roth T, Dement WC, editors. Principles and practice of sleep medicine. 5th ed. Canada: Saunders; 2011.
2. Lai H, Good M. Music improves sleep quality in older adults; *J Adv Nurse*. 2006;49(3):234-44.
3. Behrouzifar S, Zonouzi S, Nezafati M, Esmaeili H. The relationship between sleep patients and the quality of life in coronary artery bypass graft patients. *Sabzevar University of Medical Sciences Journal* 2007; 14(1):53-61.
4. Arab M, Mashayekhi F, Ranjbar H, Abazari F, Dortaj E. Comparing the effects of using earplugs and eye masks on sleep quality of patients in coronary care unit (CCU). *J Army Univ Med Sci*. 2013; 11(2):143-9.
5. Mystakidou K, Parpa E, Tsilika E, Pathiaki M, Patiraki E, Galanos A, et al. Sleep quality in advanced cancer patients. *J Psychosom Res*. 2007 May; 62(5):527-33.
6. Fauci AS, Braunwald E, Isselbacher KJ, Wilson JD, Martin JB, Kasper DL, et al, editors. *Harrison's principles of internal medicine*. 18th ed. New York: McGraw Hill, HealthProfessions Division; 2012.
7. Mohammadi Zeidi A, Khalaj M, Naghi zadeh Jahromi MM. Quality of life in people with lower back pain. *Salmand Iran J Ageing* 2007; 1(2): 119-24.
8. Bonaros N, Hennerbichler D, Friedrich G, Kocher A, Pachinger O, Laufer G. Increased mortality and perioperative complications in patients with previous elective percutaneous coronary interventions undergoing coronary artery bypass surgery. *J Thorac Cardiovasc Surg* 2009; 137(4): 846-852.
9. Imani pour M, Basam pour Sh, Haghani HR. Prevention of heart disease and knowledge of (relative) high risk factors. *Tehran University of Medical science*. 2009; 14(2): 41-9.
10. Shojaei F. Quality of life in patients with heart failure. *Hayat, Journal of aculty of Nursing and Midwifery, Tehran University of Medical Sciences*. 2008; 14(2): 5-13.
11. Parker KP, Dunbar SB. Sleep in cardiac surgery. *Critical care nursing: Synergy for optimal outcomes*. 5nded. Philadelphia: Lippincott; 2005. 197-212.
12. Erickson VS, Westlake CA, Dracup KA, Woo MA, Hage A. Sleep disturbance symptoms in patients with heart failure. *AACN Clin Issues*. 2003 Nov; 14(4):477-87.
13. Chen HM, Clark AP. Sleep disturbances in people living with heart failure. *JCN*. 2007; 22(3): 177-185.
14. Schiza SE, Simantirakis E, Bouloukaki I, Mermigkis C, Arfanakis D, Chrysostomakis S, et al. Sleep patterns in patients with acute coronary syndromes. *Sleep Med*. 2010 Feb; 11(2): 149-53.
15. Bastani F, Shamsikhani S, Negarande R, Borna M, Haghghani H. Effect of acupressure on severity of fatigue in women with multiple sclerosis. *Complementary Medicine Journal of faculty of Nursing&Midwifery*. 2013; 3(3):59-69.
16. Cherniack EP. The use of alternative medicine for treatment of insomnia in the elderly. *Int Psychogeriatr* 2006; 6(1): 21 -30.
17. Daniel R, Gredell RN, Wilkins FR. *Nursing fundamentals: caring & clinical decision making*. 2nd Ed. New York: Cengage Delmar Learning; 2010. P: 1476-85.
18. Arab z, Shariati A, Bahraeni H, Asayesh H, Vakili M. Acupressure effect on sleep quality in patients undergoing hemodialysis. *Orumieh University of Medical Sciences Journal*. 2013; 10(37):237-45.
19. Backer M, Michael G. *Acupuncture in the treatment of pain. An integrative approach*. 1th Edition. United Kingdom: Churchill Livingstone; 2010. p: 370- 380.
20. Tsay S-L, Chen H-L, Chen S-C, Lin H-R, Lin K-C. Effects of reflexotherapy on acute postoperative pain and anxiety among patients with digestive cancer. *Cancer nursing*. 2008; 31(2):109-15.
21. HosseinAbadi R, Norosi K, Karimlo B, Madah B. Effect of massage pressure points on sleep quality in the elderly. *Journal of Rehabilitation*. 2008; 9: 8-14.
22. Sun J, Sung M, Huang M, Cheng G, Lin C. Effectiveness of acupressure for residents of long-term care facilities with insomnia: a randomized controlled trial. *Int J Nurs Stud* 2010; 47:798-805.
23. Cerrone R, Giani L, Galbiati B, Messina G, Casiraghi M, Proserpio E et al. Efficacy of HT 7

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- point acupressure stimulation in the treatment of insomnia in cancer patients and in patients suffering from disorders other than cancer. *Minerva Med* 2008; 99(6):535-37.
24. Moradi M, Mehrdad N, Nikpoor S, Hghghani H, Sharifi F. Sleep and health related quality of life in patients with chronic heart failure. *Iranian Journal of Nursing Research*. 2013; 8(29): 19-25.
 25. Bagheri Nesami M, Heydari Gorji M, Rezaie S, Pouresmail Z, Yazdani Chorati J. The effect of acupressure on the quality of sleep in patients with acute coronary syndrome in CCU. *Iran J Crit Care Nurs* 2014; 7(1):7-14.
 26. Chen Ji, Chao YH, Lu SF, Shiung TF, Chao YF. The effect of valerian acupressure on the sleep of ICU patients. *Int J Nurs Stud* 2012; 8(49):913-920.
 27. Leigh TJ, Bird HA, Hindmarch I, Constable PD, Wright V. Factor analysis of the St. Mary's Hospital Sleep Questionnaire. *Sleep* 1988;(5)11:448-453.
 28. Moeini M, Khadibi M, Bekhradi R, Mahmoudian SA, Nazari F. Effect of aromatherapy on the quality of sleep in ischemic heart disease patients hospitalized in intensive care units of heart hospitals of the Isfahan University of Medical Sciences. *Iran J Nurs Midwifery Res*. 2010; 15(4):234-239.
 29. Abolhasani Sh. Investigation of the effect of sensory stimulations on sleep deprivation symptoms in patients hospitalized in coronary care unit. *Koomesh, Journal of Semnan University of Medical Sciences*. 2005; 7(1-2): 71-76.
 30. Schiza SE, Simantirakis E, Bouloukaki I, Mermigkis C, Arfanakis D, Chrysostomakis S, et al. Sleep patterns in patients with acute coronary syndromes. *Sleep Med j* 2010;11(2):149-153.
 31. Zeraati F, Seif Rabie MA, Araghchian M, Sabouri T. Assessment of quality of sleep and use of drugs with sedating properties in adult patients hospitalized in Hamadan Ekbatan hospital. *Hamedan Journal University of Medical Sciences Journal*. 2007; 16(4):31-36.
 32. Ozgoli G, Armand M, Heshmat R, Alavi Majd H. Acupressure effect on sleep quality in menopausal women. *Complementary Medicine Journal of Faculty of Nursing & Midwifery*. 2012;2(3):9-18.
 33. Lee SY, Baek YH, Park SU, Moon SK, Park JM, Kim YS, et al. Intradermal acupuncture on shenmen and nei-kuan acupoints improves insomnia in stroke patients by reducing the sympathetic nervous activity: a randomized clinical trial. *Am J Chin Med*. 2009;37(6):1013-1021.
 34. Wang XY, Yuan SH, Yang HY, Sun YM, Cheng FP, Zhang CL, et al. Abdominal acupuncture for insomnia in women: a randomized controlled clinical trial. *Acupuncture & Electrotherapeutics Research*. 2008; 33(1-2):33-41.
 35. Hachul H, Garcia TK, Maciel AL, Yagihara F, Tufik S, Bittencourt L. Acupuncture improves sleep in postmenopause in a randomized, double-blind, placebo-controlled study. *Climacteric*. 2013;16(1):36-40.