

## Research Paper

# The Effect of Heat Therapy on the Severity of Restless Legs Syndrome and Sleep Quality in the Elderly



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Heat therapy, Restless legs syndrome, Sleep quality, Elderly

## ABSTRACT

**Objective** Restless legs syndrome is a neurological condition associated with an irresistible urge to move the legs and eventually leads to discomfort, sleep disorders, and reduced quality of life. Restless legs syndrome is common in the elderly, whose health improvement is an important healthcare issue. This study aimed to determine the effect of hot water bags on the severity of restless legs syndrome and sleep quality in the elderly.

**Methods** The study has a quasi-experimental design. In this research, 88 elderly people were selected based on purposive sampling. Then they were randomly assigned to the experimental (n=44) and control (n=44) groups. The intervention group received a hot water bag on the leg, and the control group received routine care. Data collection tools were the demographic questionnaire, the restless legs syndrome rating scale, and the Pittsburgh sleep quality index. The questionnaires were completed as a self-report. Data were analyzed with the independent t test and paired t test using SPSS.

**Results** The Mean±SD scores of restless legs syndrome were 16.7±0.46 in the experimental group and 16.50±1.17 in the control group before the intervention, which was not significantly different (P=0.32). The Mean±SD scores of restless legs syndrome were 10.68±1.52 in the experimental group and 15.55±1.79 in the control group after the intervention, which was significantly different (P=0.0001). In addition, the mean ± SD scores of sleep quality were 8.3±1.5 and 10.42±1.89 in the control group and the experimental group after the intervention, which showed a significant difference (P=0.0001).

**Conclusion** Findings showed that the hot water bag application reduces the severity of restless legs syndrome and improves sleep quality. Therefore, a hot water bag is especially recommended for the elderly, as it is cheap, accessible, and acceptable.

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## English Version

### Introduction

**A**ging is a psychological process that begins with birth and continues throughout life [1]. Increased life expectancy and a growing older population have been among the achievements of the 21<sup>st</sup> century. Aging is a phenomenon that human societies have encountered or will encounter [2]. About 60% of older people live in developing countries. This figure is predicted to increase largely by 2050 [3]. The impact of the increasing elderly population has had different consequences on various social and economic dimensions, including the resources for health care [4]. Aging is a critical period in a person's life in which the function of organs decreases [5] and puts them at risk for disease and illness [6]. Therefore, healthcare providers, including nurses, must be able to identify the needs of the elderly and meet their requirements [7].

Restless leg syndrome (RLS) is a condition that causes an uncontrollable urge to move legs, usually because of an uncomfortable sensation. RLS is accompanied by pain, tingling, and numbness and is exacerbated by rest and inactivity, especially at night [8]. Although the prevalence of RLS in the general population is about 2%-15% [9], the prevalence and severity of the symptoms of RLS increase with age, as it has been reported to be up to 35% in the older adult population [10]. The RLS has many complications, such as poor quality of life, sleep disorders, high risk of cardiovascular disease, and maybe depression [11].

Sleep is one of the basic human needs and an important part of life [12]. Adequate sleep is necessary for conserving energy and physical and psychological well-being [13]. Sleep disorders occur at any age [14]; however, in the elderly, changes occur in the quality of sleep and circadian rhythms [15]. Some research has shown that poor quality sleep is the third most common cause of aging problems after headaches and digestive disorders, so about 35% of people over 60 do not have adequate sleep quality [2]. Sleep disorders in the elderly include apnea, periodic leg movements during sleep, RLS, insomnia, waking up early in the morning, and the need for daily naps [16]. Sleep disorders affect human health, cognitive function, level of concentration, and a person's ability to engage in everyday activities. The risk of depression and anxiety increases, and the ability to cope with stressful situations decreases [17]. Sleep disorders are also closely associated with changing mental states, in-

creased mortality, and decreased life quality [18]. Quality of life is defined as the satisfaction of the person from life [19]. Therefore, paying attention to sleep quality is very important [20]. One of the leading causes of sleep disorders, especially in the elderly, is RLS.

The foundation of treatment of RLS is based on pharmacological and nonpharmacological therapies, and the goal is to eliminate the symptoms and reduce the adverse effects of this syndrome. However, the medication can be accompanied by unpleasant side effects [21, 22]. One of the common treatment methods for musculoskeletal pain relief is the use of heat. Heat treatment raises skin temperature, which dilates capillaries and increases blood flow to the area [23]. Providing heat therapy increases blood flow to a specific location and improves circulation. Vasodilation facilitates healing through an enhanced supply of nutrients and oxygen and removes pain-inducing mediators produced as a by-product of tissue damage [24, 25]. Various forms of heat therapy are used to improve a variety of musculoskeletal disorders [26]. It seems that nurses traditionally apply heat, cold, and some types of massage to reduce pain, but it is necessary for them to present and document the effectiveness of these interventions with scientific evidence. They also state that the methodological evidence for using heat and cold, especially chronic pain, is limited [27]. Considering the significant prevalence of RLS and the high prices of prescription drugs for relief of this syndrome and its numerous complications, this study was performed to determine the effect of a hot water bag on the severity of RLS and sleep quality (SQ) in the elderly.

### Methods

This study was a quasi-experimental study using experimental and control groups in 2021. The sample size was estimated at 44 for each study group using this formula considering  $S^1=1.41$ ,  $S^2=1.7$ ,  $\mu_1=1.4$ ,  $\mu_2=2.4$ , the significance level of 0.05, and a subject attrition rate of 10% (Equation 1).

$$1. n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}$$

The samples were selected by the purposive sampling method. The elderly with RLS who met the inclusion criteria and consented to participate in the study were selected. Then, 88 older people were randomly assigned to the two groups using computer-generated random numbers. The inclusion criteria were as follows: having at least a moderate level of RLS, aged over 65 years,

normal neurological and vascular status, without major musculoskeletal disorders that impair physical activity, and no wounds and redness of the limbs. The exclusion criteria were as follows: insensitivity to heat and the presence of a catabolic process such as cancer, diabetic neuropathy, unconsciousness, use of opioid medications and psychotropic drugs, alcohol abuse, neuromuscular disorders and arthritis under treatment, and the use of hot or cold water bags by the older people at home at the beginning of the study. Also, unwillingness to continue cooperation, dissatisfaction with the intervention and incidence of skin reactions during the study were other exclusion criteria. Elderly participants in the study were selected from two comprehensive health centers in Yazd Province, Iran.

All eligible elderly people were invited to the study through the comprehensive community health centers by phone. In the experimental group, during a routine visit to health centers, the elderly and their caregivers were instructed to use a hot water bag and ROTHO bath thermometer. They were required to have the hot water bag used at a temperature of 40°C-43°C, 1/3 to 2/3 of which was filled on muscle on the front and back of the lower leg. Then, both bags were covered with a towel. The temperature of the bags was measured with a bath thermometer. Researchers in health centers or caregivers assessed after 10 minutes of using the bags the condition of the skin and the reaction of the older in health centers or at home, and in the presence of pain, redness, and swelling, the bags were removed. The duration of using bags was considered 20 minutes based on the textbook of fundamental nursing [28]. The hot water bag was used for 4 weeks, once a day, for 20 minutes at home. The control group received routine care in health centers.

The data collection tool was a demographic questionnaire of elderlies, including gender, age, marriage, and level of education. The second questionnaire was related to the RLS based on the international RLS severity scale. The scale consisted of ten items on a 5-point Likert scale since each item had 0 to 4 points (very severe, severe, moderate, mild, none). The severity of symptoms was classified into five categories based on the obtained points: no problem (0), mild (1-10), moderate (11-20), severe (21-30), and very severe (31-40) [29]. Meharaban et al. examined the validity using the content validity method and reliability by Cronbach alpha of 0.97 [30].

The third part of the questionnaire was the Pittsburgh Sleep Quality Index (PSQI), developed by Boyce et al. in 1989. This questionnaire assessed the quality of sleep over the past month. It has 9 items. Item 5 has 10 sub-categories that provide a general description of SQ, sleep delay, useful sleep duration, the ratio of useful sleep duration to the total time spent in bed, sleep disorder, and waking up due to the shortness of breath, nocturnal cough, body aches, extreme cold, extreme heat, use of sleeping pills to fall asleep, drowsiness, and inability and non-motivation to exercise during the day caused by insomnia. All 19 items were given three types of scores to score the PSQI. Getting a total score above 5 in the whole PSQI means poor SQ [31]. The PSQI is a standard tool for assessing sleep quality over the past month. The validity and reliability of the PSQI have been confirmed in several studies. Buysse et al. stated the internal validity of 0.83 and the reliability coefficient in the re-test to be 0.85 [32]. Parker et al. also described a sensitivity of 90% and specificity of 87% [33]. Bertolazi et al. declared a reliability coefficient of 0.82 with high validity [34]. Also, Hosseinabadi et al. in Iran reported the reliability of the PSQI as equal to 0.88 [35]. The researcher completed the questionnaires through in-person interviews one week before and one month after the study.

Data were analyzed by SPSS16 using descriptive statistics, including mean, standard deviation, frequency, and percentage. The inferential statistics were conducted using the paired t test and independent t test. The normality of data distribution was determined using the Kolmogorov-Smirnov test ( $P=0.05$ ).

The Ethics Committee of Shahid Sadoughi University of Medical Sciences in Yazd, Iran, approved this study with the ethical code: IR.SSU.REC.1397.089 on October 23, 2018. Informed written consent was obtained from the elderly, and no fees were imposed on the participants.

## Results

This study was performed on 88 elderly people. Four subjects in both groups were excluded from the study due to a lack of cooperation or unfinished questionnaire completion. Finally, the analysis was performed on 80 participants. The experimental and control groups were all married, and the Mean $\pm$ SD age of the experimental group was 69.34 $\pm$ 4.34 years, and that of the control group was 70.53 $\pm$ 5.51 years. There were no significant differences in demographic characteristics using the independent t test and Chi-square test (Table 1).

**Table 1.** Comparing the Frequency of Demographic Characteristics Between the Two Groups

Variable	No. (%)		p*	
	Experimental	Control		
Gender	Male	17(42.5)	19(47.5)	0.89
	Female	23(57.5)	21(52.5)	
Education level	Illiterate	21(52.5)	24(60)	0.82
	Under Diploma	9(22.5)	11(27.5)	
	Diploma & higher	10(25)	5(12.5)	

\*The Chi-square test.

**Table 2.** Comparing the Mean Score of Restless Leg Syndrome Severity in the Experimental and Control Groups

The Severity of Restless Legs Syndrome	Mean±SD		P
	Experimental	Control	
Pre-test	16.7±0.46	16.50±1.17	0.32
Post-test	10.68±1.52	15.55±1.79	0.0001
P	0.0001	0.21	

Based on the findings, the mean score of RLS in the experimental and control groups was not significantly different in the pretest (P=0.32). The mean score of RLS was significantly different in the experimental and control groups in the posttest (P=0.0001). In addition, the mean score of RLS in the experimental group was significantly different in the pretest and posttest (P=0.0001). The mean score of RLS in the control group was not significantly different in the pretest and posttest (P=0.21) (Table 2).

Other findings showed that the mean score of SQ was not significantly different in the experimental and control groups in the pretest (P=0.76). The mean scores of SQ were significantly different between the experimental and control groups in the post-test (P=0.0001). Also, the mean score of SQ was significantly different in the experimental group in the pretest and post-test (P=0.0001). The mean scores of SQ were not significantly different in the control group in the pretest and post-test (P=0.76) (Table 3).

**Table 3.** Comparing the Mean Score of Sleep Quality in the Experimental and Control Groups

Sleep Quality	Mean±SD		P*
	Experimental	Control	
Pre-test	10.4±1.93	10.53±1.95	0.76
Post-test	8.3±1.5	10.42±1.89	0.0001
Mean**	0.0001	0.76	

\*The independent samples t test.

\*\*The paired sample t test.

## Discussion

This study was performed to determine the effect of hot water bags on the severity of RLS and SQ on 80 elderly people in the experimental and control groups. The majority of women were illiterate, and the average age of the participating older adults was in the range of 65-75 years. All participants were married, and the majority of them used analgesics.

In the experimental group, the mean score of RLS was moderate before the intervention but changed to a mild level after the intervention with a significant difference. However, the severity of RLS was moderate in the control group before and after the study, with no significant difference. The severity of RLS showed significant differences between the experimental and control groups after the study. No similar studies were found in the literature. However, Nasiriani and Eftekhari (2016) suggested the use of hot water bags as an effective, safe, low-cost method and especially with the ability to be used by patients and their families to relieve the symptoms of restless legs of hemodialysis patients [36]. Jafarimanesh et al. (2020) showed that the intervention with hot water could be used to improve the sleep quality of pregnant women [37]. Yildirim et al. (2010) showed that using heat for one day reduces pain and disability in patients with osteoarthritis of the knee [38]. Lakotaei et al. (2008) in Thailand reported a reduction in pain scores during the first two days of the hot herbal compress group with a statistically significant difference and a faster effect than the other two groups [39]. Another study evaluated water use (both hot and cold) in 80 pregnant women with anemia problems and showed good results [40]. According to the findings of the above study and other studies, the use of heat therapy can reduce the severity of restless leg syndrome.

Other results showed that the mean sleep quality score was significantly poor before the study in the experimental and control groups. Nevertheless, after the intervention, according to the interpretation of the PSQI in the experimental group, the SQ of the elderly was still poor but significantly improved. SQ was significantly poor in the control group before and after the study, and no difference was observed. However, a significant difference was found between the experimental and control groups regarding SQ after the intervention. Although no similar studies were found in the literature, in this context, Dadashpour et al. (2013) reported a significant difference in SQ scores in the posttest in the experimental and control groups after a period of water exercise in male elders [41]. Also, Nasiri et al. (2015) showed that

foot baths and reflexology improve SQ in the elderly [42]. Therefore, the findings of this study confirmed that previously using a hot water bag can reduce the severity of restless leg syndrome and improve the quality of sleep. Heat therapy can reduce or eliminate symptoms of RLS and improve SQ.

One of the limitations of the present study was the inability to blind the research and the specificity of the interventions. Another limitation was the lack of knowledge of the accurate use of the hot water bag by the elderly at home, which was beyond the researcher's control. In addition, another limitation was the lack of objective data (such as polysomnography) to exclude other sleep disorders or to evaluate the concomitant presence of Limb Movement Disorders (PLMS) associated with RLS in a high percentage of cases. Another limitation was that of not having carried out blood chemistry tests with the evaluation of the iron status. A possible condition of anemia, often associated with RLS, could induce different thermoregulation in patients.

## Conclusion

Using a hot water bag significantly reduced the average severity of RLS and improved SQ. Since relieving an older person's pain and discomfort is one of the main tasks of healthcare workers, it is necessary to use such interventions that are cheap, easy, available, and acceptable to older adults and are convenient for patients with RLS.

## Ethical Considerations

### Compliance with ethical guidelines

This study was carried out in accordance with the Declaration of Helsinki. This research was approved by the Ethics Committee of [Shahid Sadoughi University of Medical Sciences and Health Services](#); Yazd (IR.SSU.REC.1397.089) on October 23, 2018. The informed written consent forms were obtained from all participants.

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### Authors' contributions

Contributed equally to the design and implementation of the research: Hojjat Azizkhani, Hossein Nazmieh, and Khadijeh Nasiriani; Contributed to the analysis of the results and writing of the manuscript: Arefeh Deh-

ghani; Contributed to the implementation and data acquisition of the research: Hojjat Azizkhani; Were fully accountable for ensuring the study's accuracy and had read and approved the final manuscript: All authors.

#### **Conflicts of interest**

The authors declared no conflict of interest.

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## مقاله پژوهشی

# تأثیر گرما-درمانی بر شدت سندرم پای بی‌قرار و کیفیت خواب سالمندان

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## چکیده

**هدف:** سندرم پای بی‌قرار یک بیماری عصبی است که همراه با میل غیر قابل مقاومت در حرکت دادن پاها می‌باشد که در نهایت منجر به ناراحتی، اختلالات خواب، و کاهش کیفیت زندگی می‌شود. سندرم پای بی‌قرار در افراد مسن شایع است که بهبود سلامت آنها یک مسئله مهم در مراقبت‌های بهداشتی محسوب می‌شود.

**روش‌ها:** این پژوهش از نوع نیمه-تجربی است. در این پژوهش ۸۸ نفر از سالمندان به روش نمونه‌گیری هدفمند انتخاب شدند. سپس به طور تصادفی در دو گروه آزمایش (۴۴ نفر) و کنترل (۴۴ نفر) قرار گرفتند. گروه مداخله یک کیسه آب گرم روی پا و گروه کنترل مراقبت‌های معمول را دریافت کردند.

**یافته‌ها:** میانگین نمرات سندرم پای بی‌قرار قبل از مداخله در گروه آزمایش  $16/7 \pm 0/46$  و در گروه کنترل  $16/50 \pm 1/17$  بود که تفاوت معنی‌داری نداشت ( $P=0/32$ ). میانگین  $\pm$  انحراف معیار نمرات سندرم پای بی‌قرار بعد از مداخله در گروه آزمایش  $10/68 \pm 1/52$  و در گروه کنترل  $8/3 \pm 1/5$  بود که تفاوت معنی‌داری داشت ( $P=0/001$ ). همچنین میانگین نمره کیفیت خواب در گروه کنترل  $10/3 \pm 1/5$  و گروه آزمایش  $10/42 \pm 1/89$  بعد از مداخله بود که تفاوت معنی‌داری را نشان داد ( $P=0/001$ ).

**نتیجه‌گیری:** یافته‌ها نشان داد که کاربرد کیسه آب گرم باعث کاهش شدت سندرم پای بی‌قرار و بهبود کیفیت خواب می‌شود. بنابراین، کیسه آب گرم به ویژه برای افراد مسن توصیه می‌شود، زیرا ارزان، در دسترس و قابل قبول است.

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## کلیدواژه‌ها:

گرما-درمانی، سندرم پای بی‌قرار، کیفیت خواب، سالمندان

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## مقدمه

فرسایش موضوع ۱۰٪ (فرمول شماره ۱).  
 $\mu_1 = 1/4$ ،  $\mu_2 = 2/4$ ، ۴۴ نفر برای هر گروه برآورد شد. ۰/۰۵، و نرخ

$$1. n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}$$

نمونه‌ها به روش نمونه‌گیری هدفمند انتخاب شدند. سالمندان مبتلا به سندروم پای بی‌قرار که معیارهای ورود به مطالعه را داشتند و رضایت به شرکت در مطالعه داشتند، انتخاب شدند. سپس ۸۸ سالمند با استفاده از اعداد تصادفی تولید شده توسط کامپیوتر به طور تصادفی در دو گروه قرار گرفتند. معیارهای ورود به مطالعه به شرح زیر بود: داشتن حداقل سطح متوسط ابتلا به سندروم پای بی‌قرار، سن بالای ۶۵ سال، وضعیت عصبی و عروقی نرمال، بدون اختلالات اسکلتی عضلانی عمده که فعالیت بدنی را مختل می‌کند، و بدون زخم و قرمزی اندام‌ها. معیارهای خروج از مطالعه عبارت بودند از: عدم حساسیت به گرما و وجود یک فرآیند کاتابولیک مانند سرطان، نوروپاتی دیابتی، بیهوشی، مصرف داروهای مخدر و روانگردان، سوء مصرف الکل، اختلالات عصبی عضلانی و آرتروز تحت درمان، و استفاده از گرم یا کیسه های آب سرد توسط افراد مسن در خانه در ابتدای مطالعه.

## یافته‌ها

این مطالعه بر روی ۸۸ سالمند انجام شد. چهار نفر در هر دو گروه به دلیل عدم همکاری یا تکمیل ناتمام پرسشنامه از مطالعه حذف شدند. در نهایت، تجزیه و تحلیل بر روی ۸۰ شرکت کننده انجام شد. گروه آزمایش و کنترل همگی متاهل بودند و میانگین سنی گروه آزمایش  $69/34 \pm 4/34$  سال و گروه کنترل  $70/53 \pm 5/51$  سال بود. با استفاده از آزمون t مستقل و آزمون خی تفاوت معنی‌داری در ویژگی‌های دموگرافیک وجود نداشت (جدول ۱).

سالمندی یک فرآیند روانی است که با تولد شروع می‌شود و در طول زندگی ادامه می‌یابد [۱]. افزایش امید به زندگی و افزایش جمعیت از جمله دستاوردهای قرن بیست و یکم بوده است. سالمندی پدیده‌ای است که جوامع بشری با آن مواجه بوده و یا خواهد شد [۲]. حدود ۶۰ درصد از سالمندان در کشورهای در حال توسعه زندگی می‌کنند. پیش بینی می‌شود که این رقم تا سال ۲۰۵۰ تا حد زیادی افزایش یابد [۳]. تأثیر افزایش جمعیت سالمندان پیامدهای متفاوتی بر ابعاد مختلف اجتماعی و اقتصادی از جمله منابع مراقبت‌های بهداشتی داشته است [۴]. سالمندی یک دوره حیاتی در زندگی فرد است که در آن عملکرد اندام‌ها کاهش می‌یابد [۵] و آنها را در معرض خطر بیماری و بیماری قرار می‌دهد [۶]. بنابراین، ارائه دهندگان مراقبت‌های بهداشتی، از جمله پرستاران، باید بتوانند نیازهای سالمندان را شناسایی کرده و نیازهای آنها را برآورده سازند [۷].

خواب یکی از نیازهای اساسی انسان و بخش مهمی از زندگی است [۱۲]. خواب کافی برای حفظ انرژی و رفاه جسمی و روانی لازم است [۱۳]. اختلالات خواب در هر سنی رخ می‌دهد [۱۴]. اما در سالمندان تغییراتی در کیفیت خواب و ریتم شبانه روزی رخ می‌دهد [۱۵]. اختلالات خواب بر سلامت انسان، عملکرد شناختی، سطح تمرکز و توانایی فرد برای شرکت در فعالیت‌های روزمره تأثیر می‌گذارد. خطر افسردگی و اضطراب افزایش می‌یابد و توانایی مقابله با موقعیت‌های استرس‌زا کاهش می‌یابد [۱۷]. اختلالات خواب نیز ارتباط نزدیکی با تغییر حالات روانی، افزایش مرگ و میر و کاهش کیفیت زندگی دارند [۱۸].

## روش

این پژوهش یک مطالعه نیمه تجربی با استفاده از گروه‌های آزمایش و کنترل در سال ۲۰۱۲ بود. حجم نمونه با استفاده از این فرمول با در نظر گرفتن سطح معنی‌داری  $S^2 = 1/4$ ،  $S^1 = 1/4$

جدول ۱. مقایسه فراوانی ویژگی‌های جمعیت‌شناختی بین دو گروه

P	درصد فراوانی		متغیرها
	گروه کنترل	گروه تجربی	
۰/۸۹	۱۹(۴۷/۵)	۱۷(۴۲/۵)	مرد
	۲۱(۵۲/۵)	۲۳(۵۷/۵)	زن
۰/۸۲	۲۴(۶۰)	۲۱(۵۲/۵)	بی‌سواد
	۱۱(۲۷/۵)	۹(۲۲/۵)	زیردیپلم
	۵(۱۲/۵)	۱۰(۲۵)	دیپلم و بالاتر

## بحث

ارزان، آسان، در دسترس و قابل قبول بوده و برای بیماران مبتلا به سندروم پای بی‌قرار راحت باشد، ضروری است.

### ملاحظات اخلاقی

#### پیروی از اصول اخلاق پژوهش

این مطالعه با عنایت به اعلامیه هلسینکی انجام شد. این پژوهش در تاریخ ۲ مهر ۱۳۹۷ توسط کمیته اخلاق دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شهید صدوقی یزد تأیید شد (IR.SSU.REC.1397.089).

#### حامی مالی

این مطالعه با حمایت مالی از دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شهید صدوقی یزد (۶۰۳۷) یزد انجام شد

#### مشارکت نویسندگان

مشارکت مساوی در طراحی و اجرای پژوهش: حجت عزیزخانی، حسین نظمیه و خدیجه نصیرانی. مشارکت در تحلیل نتایج و نگارش نسخه خطی: عارفه دهقانی؛ مشارکت در اجرا و جمع‌آوری داده‌های پژوهش: حجت عزیزخانی؛ برای اطمینان از صحت مطالعه کاملاً پاسخگو بودند و دست‌نوشته نهایی را خوانده و تأیید کرده بودند: همه نویسندگان.

#### تعارض منافع

نویسندگان هیچ تضاد منافی را اعلام نکردند.

#### تشکر و قدردانی

نویسندگان از مسئولین دانشگاه علوم پزشکی و خدمات بهداشتی درمانی شهید صدوقی یزد تشکر و قدردانی می‌کنند. همچنین از مسئولین و کارکنان مراکز جامع سلامت جامعه و سالمندان شرکت‌کننده در مطالعه‌ی تشکر می‌نماییم.

این مطالعه به منظور تعیین تأثیر کیسه آب گرم بر شدت ابتلا به سندروم پای بی‌قرار و کیفیت خواب بر روی ۸۰ سالمند در گروه‌های آزمایش و کنترل انجام شد. اکثریت زنان بی‌سواد بودند و میانگین سنی افراد مسن شرکت‌کننده در محدوده ۶۵ تا ۷۵ سال بود. همه شرکت‌کنندگان متاهل بودند و اکثریت آنها از مسکن استفاده می‌کردند.

در گروه آزمایش، میانگین نمره ابتلا به سندروم پای بی‌قرار قبل از مداخله متوسط بود اما پس از مداخله با اختلاف معنی‌دار به سطح خفیف تغییر کرد. اما شدت ابتلا به سندروم پای بی‌قرار در گروه کنترل قبل و بعد از مطالعه متوسط بود و تفاوت معنی‌داری نداشت. شدت ابتلا به سندروم پای بی‌قرار تفاوت معنی‌داری را بین گروه آزمایش و کنترل پس از مطالعه نشان داد. هیچ مطالعه مشابهی در ادبیات پیدا نشد. با این حال نصیرانی و افتخاری استفاده از کیسه آب گرم را به عنوان روشی موثر، ایمن، کم‌هزینه و به‌ویژه با قابلیت استفاده توسط بیماران و خانواده‌هایشان برای تسکین علائم بی‌قراری پاهای بیماران همودیالیزی پیشنهاد کردند [۳۰]. یلدریم و همکاران نشان داد که استفاده از گرما به مدت یک روز باعث کاهش درد و ناتوانی در بیماران مبتلا به آرتروز زانو می‌شود [۳۱]. لاکوتایی و همکاران در تاییند، کاهش نمره درد در دو روز اول گروه کمپرس گیاهی گرم با تفاوت آماری معنی‌دار و اثر سریع‌تر نسبت به دو گروه دیگر گزارش شد [۳۲]. مطالعه دیگری مصرف آب (چه سرد و چه گرم) را در ۸۰ زن باردار مبتلا به مشکلات کم‌خونی ارزیابی کرد و نتایج خوبی را نشان داد [۳۳]. با توجه به یافته‌های مطالعه فوق و سایر مطالعات، استفاده از گرما درمانی می‌تواند از شدت سندرم پای بی‌قرار بکاهد.

سایر نتایج نشان داد که میانگین نمره کیفیت خواب قبل از مطالعه در گروه آزمایش و کنترل به طور معنی‌داری ضعیف بود. کیفیت خواب در گروه کنترل قبل و بعد از مطالعه به طور قابل توجهی ضعیف بود و تفاوتی مشاهده نشد. با این حال، پس از مداخله بین گروه آزمایش و کنترل از نظر کیفیت خواب تفاوت معنی‌داری مشاهده شد. بنابراین، یافته‌های این مطالعه تأیید کرد که استفاده قبلی از کیسه آب گرم می‌تواند شدت ابتلا به سندروم پای بی‌قرار را کاهش دهد و کیفیت خواب را بهبود بخشد.

### نتیجه‌گیری

طبق نتایج حاصل شده، استفاده از کیسه آب گرم به طور قابل توجهی میانگین شدت ابتلا به سندروم پای بی‌قرار را کاهش داد و کیفیت خواب را بهبود بخشید. از آنجایی که تسکین درد و ناراحتی سالمندان یکی از وظایف اصلی کارکنان مراقبت‌های بهداشتی است، استفاده از چنین مداخلاتی که برای سالمندان



## References

- [1] Amarya S, Singh K, Sabharwal M. Ageing process and physiological changes. In: D'Onofrio G, Sancarlo D, GrecoGerontology A, editors. Norderstedt: BoD-Books on Demand; 2018. [DOI:10.5772/intechopen.76249]
- [2] Gulia KK, Kumar VM. Sleep disorders in the elderly: A growing challenge. *Psychogeriatrics*. 2018; 18(3):155-65. [DOI:10.1111/psyg.12319] [PMID]
- [3] Rakhshanasab H, Hosseini S, Sattarzadeh N. Evaluation of indicators of a desirable city for the elderly (Study sample: Yasuj city). *Geography and Urban Space Development*. 2021; 1(1):1-5. [DOI:10.22067/JGUSD.2021.69614.1027]
- [4] Cristea M, Noja GG, Stefea P, Sala AL. The impact of population aging and public health support on EU labor markets. *International Journal of Environmental Research and Public Health*. 2020; 17(4):1439. [DOI:10.3390/ijerph17041439]
- [5] Sharafi H, Khonji A, Rooshenas Z, Rezaei F. [The attitude of nurses working in educational hospitals of Bandar Abbas university of medical sciences toward the elderly-2017 (Persian)]. *Development Strategies in Medical Education*. 2018; 5(1):34-41. [Link]
- [6] Laksmi, PW., et al., *Geriatric Medicine and Gerontology*. 2018.
- [7] Bahrami M, Purfarzad Z, Keshvari M, Rafiei M. The components of nursing competence in caring for older people in Iranian hospitals: A qualitative study. *Iranian Journal of Nursing and Midwifery Research*. 2019; 24(2):124-30. [DOI:10.4103/ijnmr.IJNMR\_83\_18] [PMID] [PMCID]
- [8] Sorbi MH, Issazadegan A, Soleimani E, Mirhosseini SH. Prevalence of restless legs syndrome in Iran: A systematic review and meta-analysis. *Journal of Community Health Research*. 2020; 9(3):191-202. [DOI:10.18502/jchr.v9i3.4262]
- [9] Ghasemi H, Khaledi-Paveh B, Abdi A, Jalali R, Salari N, Vaisi-Raygani A, et al. The prevalence of restless legs syndrome in patients with migraine: A systematic review and meta-analysis. *Pain Research and Management*. 2020; 2020:2763808. [DOI:10.1155/2020/2763808] [PMID] [PMCID]
- [10] Özkök S, Aydın ÇÖ, Saçar DE, Çatıkkaş NM, Erdoğan T, Kılıç C. A prevalent sleep disorder in older adults: Restless legs syndrome (Is there any association with other geriatric syndromes?). *European Journal of Geriatrics and Gerontology*. 2022. [DOI:10.4274/ejgg.galenos.2022.2022-4-7]
- [11] Ryden, A.M. and C. Alessi, *Sleep in Older Patients*. In: *Essentials of Sleep Medicine*. 2022, Springer. p. 495-513.
- [12] Azmi RN, Hanifa DN, Fernando NS, Putri MR. Description of the quality of pharmacy student sleep in the pandemic period of corona virus disease (covid-19). *Jurnal Ilmu Kesehatan*. 2021; 9(1):72-80. [DOI:10.30650/jik.v9i1.1649]
- [13] Thompson N. Sleep and association with obesity. *Journal of Pediatric Surgical Nursing*. 2018; 7(4):109-11. [DOI:10.1097/JPS.000000000000187]
- [14] Farhang Sardrodi A, Hosseinian F, Kashanimovahhed B. The effect of aromatherapy on sleep quality in the older adults: A review study. *American Journal of Essential Oils and Natural Products*. 2019; 7(4):25-9. [Link]
- [15] Yaremchuk K. Sleep disorders in the elderly. *Clinics in Geriatric Medicine*. 2018; 34(2):205-16. [DOI:10.1016/j.cger.2018.01.008] [PMID]
- [16] Ferri R, DelRosso LM, Silvani A, Cosentino FII, Picchietti DL, Mogavero P, et al. Peculiar lifespan changes of periodic leg movements during sleep in restless legs syndrome. *Journal of Sleep Research*. 2020; 29(3):e12896. [DOI:10.1111/jsr.12896] [PMID]
- [17] Alidosti M, Hemate Z, Reisi M. [Investigating the relationship between sleep quality and restless leg syndrome in kidney patients undergoing hemodialysis in the hemodialysis centers of Chaharmahal and Bakhtiari provinces in the year 2011 (Persian)]. *Journal of Kashan University of Medical Sciences*. 2013; 17(1):85-90. [Link]
- [18] Barros MBA, Lima MG, Ceolim MF, Zancanella E, Cardoso TAMO. Quality of sleep, health and well-being in a population-based study. *Rev Saude Publica*. 2019; 53:82. [DOI:10.11606/s1518-8787.2019053001067]
- [19] Halvani A, Pourfarokh N, Nasiriani K. Quality of life and related factors in patients with chronic obstructive pulmonary disease. *Tanaffos*. 2006; 5(4):53-58. [Link]
- [20] Craik F IM, Salthouse TA, *The handbook of aging and cognition*. New York: Psychology Press; 2007. [DOI:10.4324/9780203837665]
- [21] Chen JJ, Lee TH, Tu YK, Kuo G, Yang HY, Yen CL, et al. Pharmacological and nonpharmacological treatments for restless legs syndrome in end stage kidney disease: A systematic review and component network meta-analysis. *Nephrology Dialysis Transplantation*. 2021; gfab290. [DOI:10.1093/ndt/gfab290] [PMID]
- [22] Sarawad SS. Restless legs syndrome (RLS): An overview. *International Journal of Advances in Nursing Management*. 2022; 10(2):153-5. [DOI:10.52711/2454-2652.2022.00040]
- [23] Malanga GA, Yan N, Stark J. Mechanisms and efficacy of heat and cold therapies for musculoskeletal injury. *Postgraduate Medicine* 2015; 127(1):57-65. [DOI:10.1080/00325481.2015.992719] [PMID]
- [24] Freiwald J, Magni A, Fanlo-Mazas P, Paulino E, Sequeira de Medeiros L, Moretti B, et al. A role for superficial heat therapy in the management of non-specific, mild-to-moderate low back pain in current clinical practice: A narrative review. *Life (Basel)*. 2021; 11(8):780. [DOI:10.3390/life11080780] [PMID] [PMCID]
- [25] Cheng JL, MacDonald MJ. Effect of heat stress on vascular outcomes in humans. *Journal of Applied Physiology*. 2019; 126(3):771-81. [DOI:10.1152/jappphysiol.00682.2018] [PMID] [PMCID]
- [26] Clijnsen R, Stoop R, Hohenauer E, Aerenhouts D, Clarys P, Deflorin C, et al. Local heat applications as a treatment of physical and functional parameters in acute and chronic musculoskeletal disorders or pain. *Archives of Physical Medicine and Rehabilitation*. 2022; 103(3):505-22. [DOI:10.1016/j.apmr.2021.06.015] [PMID]
- [27] Wang Y, Lu H, Li S, Zhang Y, Yan F, Huang Y, et al. Effect of cold and heat therapies on pain relief in patients with delayed onset muscle soreness: A network meta-analysis. *Journal of Rehabilitation Medicine*. 2022; 54:jrm00258. [DOI:10.2340/jrm.v53.331] [PMID] [PMCID]
- [28] Perry, Potter, Βασική νοσηλευτική & κλινικές δεξιότητες. 2015.
- [29] Sharon D, Allen RP, Martinez-Martin P, Walters AS, Ferini Strambi L, Högl B, et al. Validation of the self-administered version of the international restless legs syndrome study group severity rating scale - The sIRLS. *Sleep Medicine*. 2019; 54:94-100. [DOI:10.1016/j.sleep.2018.10.014] [PMID]
- [30] Habibzadeh H, Lazari N, Ghanei Gheshlagh R. [Relationship between restless legs syndrome and sleep quality in hemodialysis patients (Persian)]. *Medical-Surgical Nursing Journal*. 2013; 2(1-2):57-62. [Link]
- [31] Zolfaghari M, Farokhnezhad Afshar P, Asadi Noghabi A A, Ajri Khamelou M. [Modification of environmental factors on quality of sleep among patients admitted to CCU (Persian)]. *Journal of Hayat*. 2013;18(4):61-68. [Link]



- [32] Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research*. 1989; 28(2):193-213. [DOI:10.1016/0165-1781(89)90047-4]
- [33] Parker KP, Bailey JL, Rye DB, Bliwise DL, Van Someren EJ. Lowering dialysate temperature improves sleep and alters nocturnal skin temperature in patients on chronic hemodialysis. *Journal of Sleep Research*. 2007; 16(1):42-50. [DOI:10.1111/j.1365-2869.2007.00568.x] [PMID]
- [34] Bertolazi AN, Fagundes SC, Hoff LS, Dartora EG, Miozzo IC, de Barba ME, et al. Validation of the Brazilian Portuguese version of the Pittsburgh sleep quality index. *Sleep Medicine*. 2011; 12(1):70-5. [DOI:10.1016/j.sleep.2010.04.020] [PMID]
- [35] Hosseinabadi R, Norouzi K, Pouresmaeil Z, Karimlou M, Sadat Madah SB. [Acupoint massage in improving sleep quality of older adults (Persian)]. *Archives of Rehabilitation*. 2008; 9(2):34. [Link]
- [36] Nasiriani K, Eftekhari A. [Effect of hot water bag on severity of restless legs syndrome in hemodialysis patients (Persian)]. *Journal of Mazandaran University of Medical Sciences*. 2016; 26(142):23-30. [Link]
- [37] Jafarimanesh H, Vakilian K, Mobasseri S. [Effects of warm and cold footbath on sleep quality in pregnant women with restless legs syndrome (Persian)]. *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2020; 23(6):51-60. [DOI:10.22038/IJOGI.2020.16880]
- [38] Yildirim N, Filiz Ulusoy M, Bodur H. The effect of heat application on pain, stiffness, physical function and quality of life in patients with knee osteoarthritis. *Journal of Clinical Nursing*. 2010; 19(7-8):1113-20. [DOI:10.1111/j.1365-2702.2009.03070.x] [PMID]
- [39] Lekutai S. [Pain-relieving effects of hot herbal compress in patients with knee osteoarthritis (Thai)]. *Journal of Thai Traditional and Alternative Medicine*. 2008; 6(2). [Link]
- [40] Jafarimanesh H, Vakilian K, Mobasseri S. Thermo-therapy and cryo-therapy to decrease the symptoms of restless leg syndrome during the pregnancy: A randomized clinical trial. *Complementary Therapies in Medicine*. 2020; 50:102409. [DOI:10.1016/j.ctim.2020.102409] [PMID]
- [41] Dadashpoor A, Mohammadi R, Dadashpoor A. [Investigating effect of a period of water exercise on sleep quality in male elders (Persian)]. *Journal of Shahid Sadoughi University of Medical Sciences*. 2013; 21(3):300-10. [Link]
- [42] Valizadeh L, Seyyedrasooli A, Zamanazadeh V, Nasiri K. Comparing the effects of reflexology and footbath on sleep quality in the elderly: A controlled clinical trial. *Iranian Red Crescent Medical Journal*. 2015; 17(11):e20111. [DOI:10.5812/ircmj.20111] [PMID] [PMCID]