



The Effect of Acupressure on Clinical Stress Management in Nursing Students: A Randomised Controlled Study

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Background: Nursing students experience clinical stress frequently and severely. The application of acupressure is reported to be effective in stress management.

Objectives: This study was conducted to determine the effects of acupressure on reducing the stress of nursing students in clinical practice.

Methods: This study was carried out using a single-blind randomized controlled experimental design. The experimental and control groups were randomly determined by using a previously prepared randomization checklist. A Participant Information Form, VAS, and the State Anxiety Inventory were applied to all students before practice. Acupressure was performed on the HT7 point and Yintang point (EX-HN3), respectively, every five minutes for a total of 30 minutes in the experimental group.

Results: The level of stress experienced by the students in the experimental group before the intervention according to VAS was 6.95 ± 1.57 , and it was determined as 2.82 ± 1.94 after the third application ($p < 0.05$). The mean clinical stress score before the application was 46.54 ± 3.81 , and after the 3rd week of application, it was 25.15 ± 5.26 ($p < 0.05$). It was observed that the students' stress levels decreased in all measurements made after the acupressure intervention.

Conclusion: This study determined that acupressure effectively reduces the stress levels of nursing students, and it may be applied in clinical stress management.

Keywords: Stress, Acupressure, Nursing students, Anxiety, Clinical stress management

INTRODUCTION

Stress is the general response to various stimulants that disrupt the individual's balance or environmental factors. Students must deal with many situations during nursing education that may induce anxiety and stress at any stage, especially in clinical practice [1]. Anxiety and stress are a significant bio-psychosocial factor that affects the student's academic performance and well-being during their education. They have a crucial role in learning and adaptation. Despite the motivating effect of mild and moderate anxiety on learning, high levels of anxiety may inadvertently cause errors at work, the breakdown in interpersonal relationships, and decrease work efficiency [2].

The clinical learning experience is an essential and necessary part of nursing education and allows nursing students to learn the necessary professional knowledge and skills. It also develops psychomotor skills that underlie the roles which enable them to socialize. Besides its contribution

to acquiring professional skills, clinical learning is among the causes that create the most anxiety and stress in students [3]. In particular, the first clinical experience may cause anxiety and stress due to challenging and unpredictable aspects, it may be perceived as a threat or danger by students, and in the face of this threat-danger perception, the person may experience stress by making several efforts to maintain or restore their balance [4]. Previous studies determined that the anxiety and stress that occurred at the early stages of clinical practice were higher than other periods. It was observed that some students had higher anxiety during their clinical learning experience than their learning experience in the classroom or laboratory [5]. In clinical practice, students have difficulty in using the theoretical knowledge that they have learned. Moreover, the difficulty of adaptation to the hospital, lack of clinical experience, unclear and non-specific instructor expectations, and unfamiliar environments that are not well-known may increase anxiety by increasing uncertainty [6].



Nursing students experience intense anxiety and stress due to thoughts, such as making mistakes at the beginning of their clinical practice, harming the patient, encountering adverse reactions, and low self-confidence. Anxious and stressed students may experience difficulties in developing relationships with healthcare professionals, decreased ability to cope with problems, and social relationships. Anxiety and stress may also be due to failing to satisfy patient expectations, deterioration in compliance with hospital functioning, fear of providing false information, and anxiety about making mistakes during hospital procedures. This may negatively affect the student's clinical performance.

Stress is an inevitable and eternal condition. Students' coping with positive stress may allow them to achieve high levels of success in both their academic and social life [2,6,7]. Therefore, it is important to determine the clinical stress levels of students and the factors that cause stress and to develop practices that will help students manage their stress.

Acupressure is a current method used in the management of stress, it has a calming and soothing effect [8]. It is known that an increase in plasma cortisol levels is effective in the development of anxiety. With the stimulation of acupuncture points, plasma cortisol levels increase and this induces a calming effect [9]. Additionally, no side effects of acupressure have been reported. It is non-invasive, easy to apply, can be performed by the individual, and is inexpensive [8]. In the literature, it was reported that acupressure is frequently applied onto the HT7 point and Yintang point (EX-HN3); it reduces stress during bone marrow biopsy in cancer patients [10], preoperative anxiety [11], and stress in hemodialysis patients [12].

To the best of our knowledge, this is the first study to have examined the effect of acupressure in nursing students for the reduction of stress. This study was conducted as a single-blind randomized controlled trial to determine the effects of acupressure in reducing the stress levels in clinical practice nursing students.

MATERIALS AND METHODS

1. Study design-setting

This study was conducted between January and March 2020 with first-year students studying in the nursing department of a foundation university located in Istanbul as a randomized controlled experimental study.

2. Participants

Students included in the study were ≥ 18 years of age, did not have any communication problems, exhibited a stress severity ≥ 4 according to VAS, had no prior knowledge of acupressure, and had no prior experience of clinical practice.

The sample size was calculated using G*Power Analysis. Assuming a significance level (α) of .05, statistical power ($1 - \beta$) of .80, we sought to include 38 participants in each group [13].

3. Data collection

A Participant Information Form, the Visual Analog Scale (VAS) for Stress, and the State Anxiety Inventory were used in this study.

1) Participant information form

There were 13 questions, including the state of readiness for clinical practice, feelings and thoughts about clinical practice, and some socio-demographic characteristics of the students (age, gender, place of residence, marital status, educational status, employment status). The form was prepared by the researchers in line with the literature [14,15].

2) Visual Analog Scale (VAS)

VAS is a 10 cm horizontal line marked with zero at one end and ten at the other end. The participants were asked to mark their stress level on the horizontal line by providing a score between 0-10. A score of zero indicated no stress, while a score of ten points indicated the maximum stress level. VAS is highly sensitive in the assessment of stress [16].

3) State-Trait Anxiety Inventory (STAI I)

The inventory was developed in 1970 by Spielberger et al. [17] to determine an individuals' state and trait anxiety levels. The Turkish validity and reliability study of the inventory was conducted by Öner and Le Compte [18]. The State-Trait Anxiety Inventory measures anxiety in teens and adults over the age of 14. This scale, which is a type of self-assessment, contains 40 questions that consist of short expressions. Items 1-20 in the scale determine the anxiety level state of the individual, and items 21-40 determine their trait anxiety level. In this study, only the state anxiety scale was used since the anxiety state of the students would be measured before and after each acupressure application. In the 20-question, 4-point Likert-type State Anxiety Inventory, the total score obtained ranged from 20 to 80. A high score indicated a high anxiety level, and a low score indicated a low anxiety level.

4. Procedure

The participating students were informed about the study, and their written consent was obtained. The Participant Information Form, Visual Analog Scale (VAS) for Stress and State Anxiety Inventory were applied among all students before the intervention. The experimental group received 30 minutes of acupressure applied onto the HT7 and Yintang point (EX-HN3) in 5-minute periods by the acupressure

therapist with an internationally valid certificate of practice (Fig. 1), [10,19]. Following the intervention, the Visual Analog Scale (VAS) for Stress and the State Anxiety Inventory was applied among all students in both groups. One week after the first acupressure application, the second acupressure application was performed with the same method, and the third acupressure application was carried out a week after the second application. After each intervention, the Visual Analog Scale (VAS) for Stress and the State Anxiety Inventory was applied among all students in both groups. No intervention was applied among the nursing students in the control group.

5. Intervention

The therapist's hands were washed before the acupressure application. The acupressure procedure was explained, and the students were informed before each application. They were asked to sit in a chair and the acupressure points were determined using the participant's fingers and marked using a surgical marker pen.

Acupressure points were performed in a specific order, HT7 followed by Yintang point (EX-HN3). Shenmen (HT7) is an acupoint located on the ulnar end of the transverse crease of the wrist, in the small depression between the pisiform and ulna bones. Yintang (EX-HN3) is an acupoint located between the eyebrows, has a mentally stabilizing effect in traditional Chinese Medicine. Ajna, known as the third-eye

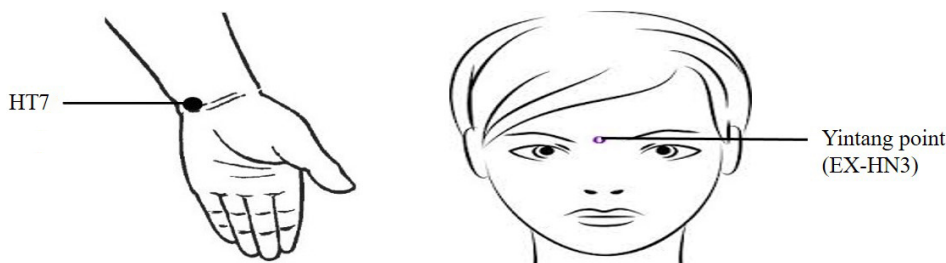


Fig. 1. Acupressure points.

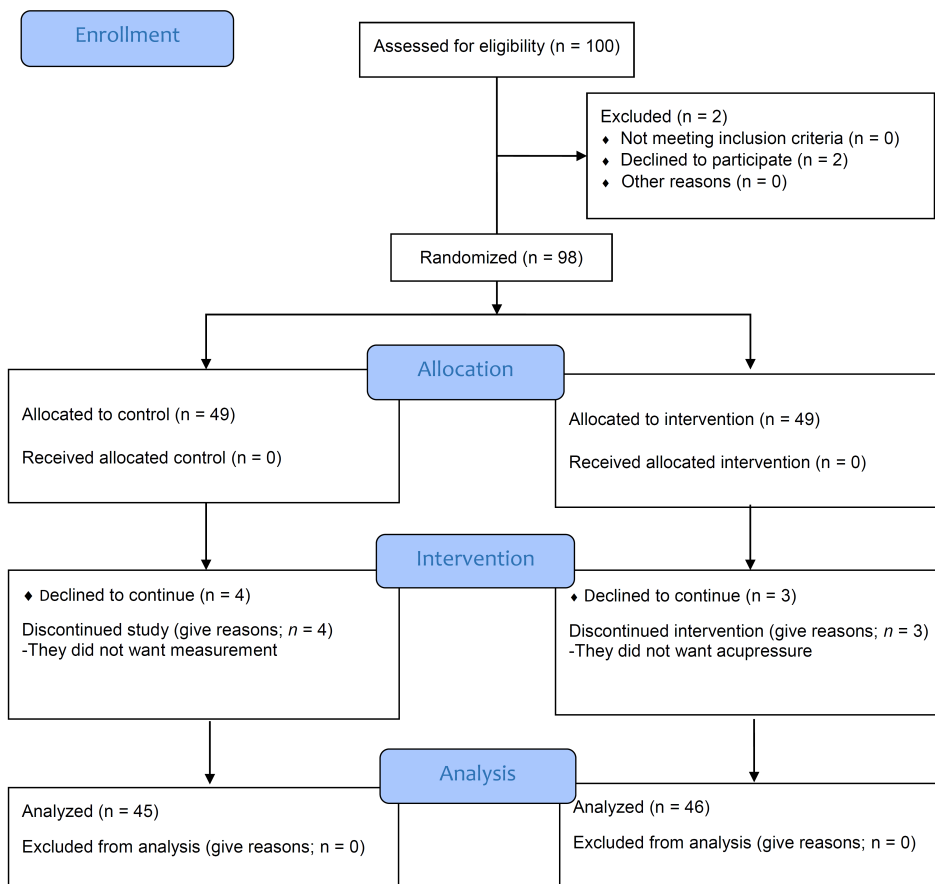


Fig. 2. Consort flow diagram.

chakra in the Hindu tradition, is also located in the same area as EX-HN3. EX-HN3 is clinically useful because it is easy to find and use, even for beginners [20]. The consecutive presses to these points were applied manually with the thumbs and index finger for five minutes (Fig. 1). The pressure was applied at a frequency that did not disturb the participants, did not cause pain, and had a calming effect. During the acupuncture application, communication with the participant was reduced to ensure focus. Thirty minutes of acupuncture was applied in five-minute periods per session.

6. Data analysis

In the statistical evaluation of the data, the means, percentages, frequencies, and median values (min-max) were

calculated. In determining the differences between groups, the Chi-square test, t-test, and two-way ANOVA test in repeated measures was used. All results were considered significant at $p < .05$ and a confidence interval of 95%. All results were obtained by a researcher blinded to the group allocations.

7. Ethical consideration

Written consents were received from the participants with a Voluntary Consent Form after being informed about the research's aim. Approval was obtained from the Ethics Committee of Istanbul Sabahattin Zaim University (IRB number: 20292139-050.01.04), Istanbul, Turkey.

Table 1. The socio-demographic characteristics of groups

Characteristics	Experimental group (n = 46)		Control group (n = 45)		Test/ χ^2	p
	n	%	n	%		
Age	Min:18 Max:25 $\bar{x} = 19.71 \pm 1.34$		Min:18 Max:25 $\bar{x} = 19.16 \pm 1.22$		t: .236	.632
Gender					2.052	.157
Female	39	84.8	37	82.2		
Male	7	15.2	8	17.8		
Economic Condition					1.305	.253
Middle	24	52.2	23	51.1		
Good	20	43.5	19	42.2		
Low	2	4.3	3	6.7		
Employment Status					.202	.453
Working	6	13.0	6	13.3		
Not working	40	87.0	39	86.7		
Feeling ready to clinical practice					.517	.472
Yes	32	69.6	30	66.7		
No	14	30.4	15	33.3		
Feeling that have sufficient theoretical knowledge for clinical practice					.201	.437
Yes	19	41.3	21	46.7		
No	27	58.7	24	53.3		
Fear from caring for patients					.106	.228
Yes	13	28.3	11	24.5		
No	33	71.7	34	75.5		
Is there any application that you are afraid of to do in the clinic					.124	.228
Yes	29	63.0	30	66.7		
No	17	37.0	15	33.3		
Are you afraid of negative clinical experience?					.209	.133
Yes	38	82.6	35	77.8		
No	8	17.4	10	22.2		
What is your feeling about clinical practice?					6.153	.296
Fear	1	2.2	2	4.4		
Excitement	15	32.6	13	28.9		
Anxiety	7	15.2	8	17.8		
Comfort	2	4.3	4	8.9		
Mixed Feelings	21	45.7	18	40.0		

min = minimum value; max = maximum value; t = t test in independent groups; χ^2 = Pearson chi-square test.

Table 2. The VAS and State Anxiety Inventory scores of experimental and control groups

Measurements	Experimental group (n = 46)	Control group (n = 45)	F	p	Partial eta squared
	$\bar{x} \pm Sd$	$\bar{x} \pm Sd$			
VAS stress			16.737	0.000	.158
Before	6.95 ± 1.57	6.28 ± 1.23			
1st week	5.43 ± 1.91	5.52 ± 1.30			
2nd week	3.23 ± 1.87	5.49 ± 1.35			
3rd week	2.82 ± 1.94	6.21 ± .26			
before-last week t**	12.245	.914			
p	.000	.295			
State anxiety inventory			49.831	0.000	.359
Before	46.54 ± 3.81	47.53 ± 4.61			
1st week	31.10 ± 6.98	45.59 ± 5.60			
2nd week	26.64 ± 6.02	42.60 ± 6.67			
3rd week	25.15 ± 5.26	43.45 ± 4.78			
before-last week t**	11.471	.868			
p	.000	.380			

F = two-way ANOVAs test in repeated measures; t** = t test in dependent groups, $p < 0.05$.

RESULTS

A total of 100 nursing students were assessed, but due to various reasons (discontinued the intervention, did not want measurement, did not want acupressure), the data from 91 participants were included in the final analysis (see Fig. 2 for the CONSORT flow diagram).

1. The socio-demographic characteristics of the participants

The socio-demographic characteristics of the participants of the study were similar. When the socio-demographic characteristics of the students were examined in the experimental and control groups, the mean ages were 19.71 ± 1.34 and 19.16 ± 1.22 , respectively. The majority of the participants were female ($n = 39, 84.8\%$ vs. $n = 37, 82.2\%$, respectively) and not working ($n = 40, 87\%$ vs. $n = 39, 86.7\%$, respectively). It was observed that most of the students were ready for first clinical practice ($n = 32, 69.6\%$ vs. $n = 30, 66.7\%$, respectively), were feeling that they had insufficient theoretical knowledge for clinical practice ($n = 27, 58.7\%$ vs. $n = 24, 53.3\%$, respectively) and were not afraid to provide nursing care for patients ($n = 33, 71.7\%$ vs. $n = 34, 75.5\%$, respectively). Moreover, it was reported that the participants were afraid of a negative clinical experience ($n = 38, 82.6\%$, $n = 35, 77.8\%$, respectively), and they felt nervousness and mixed feeling towards clinical practice (Table 1).

2. The VAS and State Anxiety Inventory scores of the participants

The stress levels of the students in the experimental group before their clinical practice decreased significantly after

acupressure, according to VAS ($p < 0.001$). Moreover, the State Anxiety Inventory scores of the participants in the experimental group decreased significantly from before the acupressure application to after ($p < 0.001$). However, there was no significant difference in the scores of the students in the control group ($p > 0.05$) (Table 2).

Both the VAS and State Anxiety Inventory scores were compared between the groups each week. There was a greater decrease in stress severity (2.82 ± 1.94 vs. $6.21 \pm .26$) ($p < 0.001$) and State Anxiety Inventory scores (25.15 ± 5.26 vs. 43.45 ± 4.78) ($p < 0.001$). It was determined that the acupressure application reduced the students' VAS stress score by 15.8% and the State Anxiety Inventory score by 35.9% ($p < 0.001$) (Table 2).

DISCUSSION

This study examined whether acupressure application effectively reduced stress levels of nursing students during their initial clinical experience. It was determined that acupressure was effective in reducing the clinical stress levels of the nursing students.

In this study, most of the students reported that they did not consider their theoretical knowledge for clinical practice sufficient, they were afraid of making mistakes and having a negative experience in clinical practice. In previous studies, it has been emphasized that thoughts of having insufficient theoretical knowledge and abilities during the beginning of clinical practice causes nurses to experience clinical stress [14,21,22]. Atay and Yilmaz (2011) [14] reported that half of the students who were in clinical practice for the first time (49.4%) were afraid of harming the patient with the idea of inadequacy. In this study, in accordance with the literature, it

was observed that the students experienced stress in clinical practice as they were afraid of having negative experiences, felt insufficient in terms of theoretical knowledge, and had nervousness and mixed feelings.

When the students' stress levels before going to the clinic were examined according to their VAS scores, it was found that the stress levels were above moderate. In parallel with this finding, it was found that the students' State Anxiety Inventory scores before acupressure were moderate, too. However, both the VAS stress level and the State Anxiety Inventory scores of the students decreased after the acupressure application. In the literature, there are studies conducted in different groups which support our results. Honda et al. (2012) [23] reported that four-week self-administrated acupressure could significantly reduce perceived stress levels in university students, and the duration and frequency of acupressure were important. In another study conducted with university students, the effects of acupressure, placebo acupressure, and relaxation sounds on stress levels were examined. In the study, it was reported that there was an equal decrease in each group. Moreover, it was stated that acupressure was not effective due to insufficient application duration of acupressure provided in only one session [15].

It has been shown that acupressure applied to the HT7, Yintang (EX-HN3), and GV29 points on hemodialysis patients significantly reduced anxiety, stress, depression, and general psychological distress. In the study, it was determined that acupressure application for four weeks effectively reduced stress [12]. Similar to their study, it was determined that acupressure reduced stress for as long as three weeks. It was reported that acupressure applied to the LI4 and HT7 points on cancer patients who underwent bone marrow aspiration and biopsy reduced the stress and anxiety experienced by the patients, and the patients felt better [10].

The acupuncture procedure typically includes gentle manual touch stimulation, which induces calmness and well-being by activating C tactile fibers. The enhanced activity of C tactile afferents (CT afferents) may induce a 'limbic touch' response, resulting in emotional and hormonal reactions with acupressure [24]. Intensive touch between the practitioner and the patient is included in the acupuncture treatment interaction. Acupuncture treatment, therefore, involves an enhanced practitioner-patient relationship that is likely characterized by the activation of CT afferents. For example, patients who were given touch therapy by a nurse the day before a surgical operation showed an alleviated stress level [25]. Additionally, it was observed that the results of this study were compatible with the literature, and acupressure application could be used to reduce the clinical stress levels of nursing students with advantages such as ease of application, inexpensive nature, and no side effects.

The greatest strength of our study was the use of a randomized controlled design. This study was also the first of its kind to be conducted in Turkey to determine the effects of acupressure on reducing the stress levels of nursing students in clinical practice. Another strength was that the same researchers conducted the collection of acupressure applications. This study was limited by its relatively small sample size and the overall number of nursing students experiencing stress. Numerous factors could have influenced the stress and anxiety scores. Controlling for these factors was impossible due to personal differences and cultural, mental, and psychological factors. The study was carried out at a single university, thus, more studies are necessary to verify our results.

CONCLUSIONS

It was observed that nursing students experienced stress in clinical practice. It was determined that the acupressure application reduced the students' VAS stress score and the State Anxiety Inventory score. Acupressure is a safe, easy, non-invasive, and an effective technique that requires no additional equipment when applied to the HT7 and Yintang (EX-HN3) points. Acupressure application was found to be effective in reducing the clinical stress levels of nursing students.

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AUTHORS' CONTRIBUTIONS

The authors have confirmed that all of the authors meet the IC-MJE criteria for authorship credit (www.icmje.org/ethical_1author.html), as follows: (DY, ÖA) making substantial contributions to the conception or design of the work; (DY, ÖA) data collection, data analysis and manuscript writing; (DY) drafting the article or revising it critically for important intellectual content.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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