Effects of acupressure on psychological distress, depression among nurses in a medical center: a single-blind randomized controlled trial

NCT Number: NCT06946888

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Study Title

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Background

Clinical nurses are routinely exposed to occupational stressors such as shift rotations, emotional labor, and high patient acuity, placing them at elevated risk of psychological distress and burnout (Zeiher et al., 2022; Katsiroumpa et al., 2025). Compared with other healthcare professionals, nurses report higher rates of emotional exhaustion and post-traumatic stress symptoms, particularly in the aftermath of the COVID-19 pandemic.

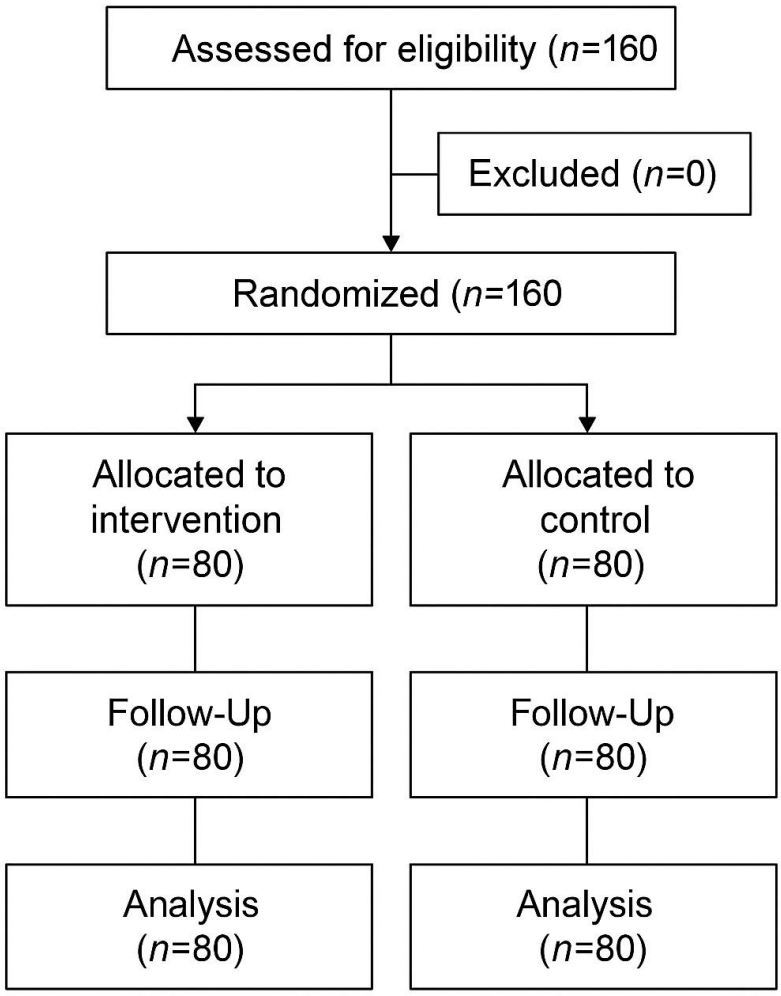
Acupressure is a complementary therapy that involves applying manual pressure to specific acupoints along the body's meridians to promote physiological and emotional regulation. Among the most studied acupoints for psychological symptoms are Shenmen (HT7) and Neiguan (PC6). HT7 is traditionally used to calm the spirit and regulate mood, and is commonly applied in treating insomnia and anxiety (Lee et al., 2019; WHO, 2008). PC6 is associated with regulating heart rhythm, relieving palpitations, and reducing stress (WHO, 2008; Lee et al., 2023). Prior studies have demonstrated that stimulation at HT7 and PC6 can reduce anxiety and depressive symptoms in patients recovering from COVID-19 (Liang et al., 2024) and improve mood stability in cardiac populations (Bal & Gun, 2024). Systematic reviews further confirm the potential of these acupoints in alleviating depression and anxiety (Lin et al., 2022).

Despite this evidence, research applying acupressure as a self-care intervention for healthcare workers—especially nurses—remains scarce. Given the high psychological demands of nursing work, evaluating accessible, low-cost interventions that nurses can self-administer without disrupting workflow is critically important. This trial addresses that gap by assessing the effects of self-administered acupressure on depressive symptoms, psychological distress, emotional distress, anxiety, job stress, occupational burnout, and resilience in clinical nurses.

Objective

This study aimed to examine the effects of self-administered acupressure at the Shenmen (HT7) and Neiguan (PC6) points on emotional distress, anxiety, depression, stress, work-related fatigue, and resilience among clinical nurses.

Methods



This study adopted a single-blind randomized controlled trial (RCT) design. It was approved by the Institutional Review Board of a medical center (IRB No. 24-CT6-13) and registered at ClinicalTrials.gov (NCT06946888). The study was conducted from June 13, 2024, to September 22, 2024. Participants included nurses aged 20 and above working in clinical departments. Exclusion criteria included: (1) refusal or inability to comply with the study; (2) non-clinical roles (e.g., administrative units, supply departments); and (3) pregnancy. Out of 463 screened nurses, 160 were eligible based on the Brief Symptom Rating Scale (BSRS-5 $\geq$ 4) or Distress Thermometer score $\geq$ 3 and agreed to participate. They were randomly assigned via computer to the intervention group (n=80) or control group (n=80).

Interventions

Participants in the intervention group received in-person instruction from a trained research assistant on how to self-administer acupressure targeting two specific acupoints on each hand—Shenmen (HT7) and Neiguan (PC6)—**resulting in a total of four acupoints (two on each hand).** Participants were guided to apply approximately 3 kg of thumb pressure to each acupoint until a sensation of soreness or tingling was perceived. Each acupoint was stimulated with 15 rhythmic presses (approximately 30 seconds per point), totaling about 2 minutes per session for all four acupoints. The intervention was performed **twice daily for two consecutive weeks**, and participants were provided with illustrated instructions (Figure 1) and a daily acupressure log to record adherence. The **control group** received no intervention. **Although the intervention lasted 2 weeks, all participants in both groups were followed for 8 weeks and completed weekly questionnaires throughout the follow-up period.**

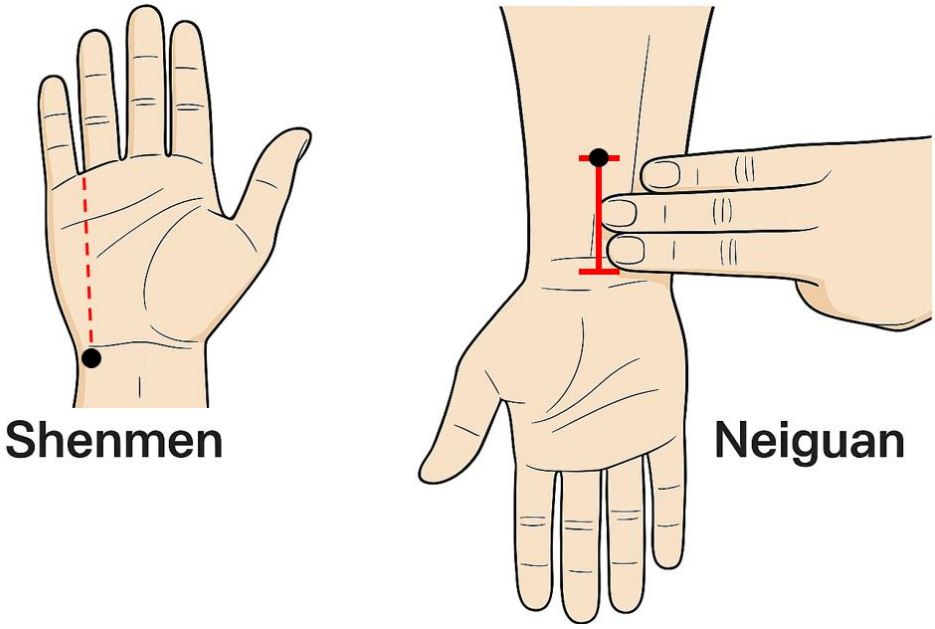


Figure 1. Anatomical locations of Shenmen (HT7) and Neiguan (PC6) acupoints.

HT7 (Shenmen) is located at the wrist crease on the radial side of the flexor carpi ulnaris tendon.

PC6 (Neiguan) is found approximately two cun (about three finger-widths) proximal to the wrist crease, between the palmaris longus and flexor carpi radialis tendons.

Instruments

Data were collected using self-administered questionnaires, which included measures of emotional distress, distress thermometer, Taiwanese Depression Scale, State Anxiety

Inventory, Nurse Stress Checklist, Occupational Fatigue Inventory, Resilience Scale, and basic demographic information. All instruments were used with permission from the original authors.

(1) **Demographic Data**:

Information collected included age, date of birth, gender, education level, current academic enrollment, marital status, number of children, living arrangements, religious beliefs, medical history, medication use, hospitalization experience, physical activity, stress-relief methods, work unit and department, experience with COVID-19 patient care, employment start date, external hospital experience, total years in nursing, self-reported sleep quality (1–10), and presence of sleep disorders.

(2) **Emotional distress**:

Emotional distress was measured using the Distress Thermometer (DT), a single-item self-report screening tool rated from 0 (no distress) to 10 (extreme distress). Higher scores indicate greater emotional distress, and participants were asked to report their overall distress during the past week, including the current day. The DT has demonstrated adequate psychometric properties across validation studies, with sensitivity ranging from 0.50 to 1.00 (median = 0.83) and specificity ranging from 0.36 to 0.98 (median = 0.68) (Donovan et al., 2014).

For the purpose of this study, a **DT cut-off score of ≥3** was adopted as an inclusion criterion. This threshold has been recommended in a large-scale validation study as an efficient marker of clinically elevated distress (Cutillo et al., 2017). Other studies have shown that optimal DT cut-offs vary across settings, typically ranging from 3 to 5 (Donovan et al., 2014), while clinical practice often applies a threshold of ≥4 or ≥5 (Ownby, 2019). Using ≥3 in this study was intended to maximize sensitivity and minimize the risk of under-identification in a nursing population considered at high risk for psychological distress.

(3) **Psychological distress**:

Psychological distress was measured using the 5-item Brief Symptom Rating Scale (BSRS-5; Lee et al., 2010), a validated screening tool for general psychological distress. The BSRS-5 assesses the subjective severity of (1) anxiety (feeling tense or keyed up), (2) depression (feeling blue), (3) hostility (feeling easily annoyed or irritated), (4) inferiority (feeling inferior to others), and (5) insomnia (difficulty falling asleep). Each item is rated on a 5-point Likert scale ranging from 0 (“not at all”) to 4 (“extremely severe”), with

higher scores indicating greater psychological distress. Total scores range from 0 to 20, and the BSRS-5 demonstrated good internal consistency in the present study (Cronbach's $\alpha = .86$).

Validation studies have suggested that total scores of 3–4 represent an optimal threshold for identifying clinically relevant distress, based on receiver operating characteristic (ROC) curve analysis (Lee et al., 2010). At these cut-offs, the BSRS-5 showed high accuracy (AUC = 0.92), with good sensitivity (0.83) and specificity (0.86). Based on this evidence, the present study adopted a **BSRS-5 total score of ≥4** as one of the inclusion criteria, ensuring that participants with at least mild psychological distress were captured.

(4) **Depressive symptoms**:

Depressive symptoms were assessed using the Taiwanese Depression Scale (TDS; Lee et al., 2000), which has demonstrated strong psychometric properties in Taiwanese populations. The TDS consists of 18 items rated on a 4-point Likert scale: 0 = none or seldom (less than one day per week), 1 = sometimes (one to two days per week), 2 = often (three to four days per week), and 3 = almost always (five to seven days per week). Total scores range from 0 to 54, with higher scores indicating greater severity of depressive symptoms.

The results from Lee et al. (2000) demonstrated that the TDS had excellent reliability and validity. The Cronbach's alpha coefficient was 0.90, and the area under the receiver operating characteristic (ROC) curve was 0.92. The TDS also showed good concurrent validity, with a sensitivity of 0.89 and specificity of 0.92 at a cutoff score of 19.

In the present study, the TDS demonstrated excellent internal consistency, with a Cronbach's alpha of .94.

(5) **Anxiety**:

Anxiety was assessed using the State subscale of the State–Trait Anxiety Inventory (STAI-S; Spielberger, Gorsuch, & Lushene, 1970), a widely used and psychometrically validated instrument. The STAI-S consists of 20 items that assess anxiety-related feelings, thoughts, and behaviors at the time of assessment. Each item is rated on a 4-point Likert scale ranging from 1 ("not at all") to 4 ("very much so"). Items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 are reverse-scored. Total scores range from 20 to 80, with higher scores indicating greater levels of state anxiety. Scores between 20–39 indicate mild anxiety, 40–59 moderate anxiety, and 60–80 severe anxiety.

In the present study, the validated Chinese version of the STAI-S, adapted by Wang and Chung (2016), was used. Their study confirmed the multidimensional factorial structure of the Chinese version and demonstrated good psychometric properties, including adequate convergent and discriminant validity. In the present sample, the STAI-S showed excellent internal consistency (Cronbach's α = .95).

(6) **Job Stress**:

Perceived job stress was measured using the **14-item Work Pressure Inventory** developed by Huang et al. (2017), which has demonstrated good internal consistency. The scale comprises three dimensions: low self-development, workload, and job characteristics. Each item is rated on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with total scores ranging from 14 to 70. Higher scores indicate greater perceived occupational stress. In the original validation study, the Cronbach's α coefficients for the three subscales were 0.81, 0.73, and 0.77, respectively. In the present study, the Work Pressure Inventory showed good overall internal consistency (Cronbach's α = .84).

(7) **Occupational burnout**:

Occupational burnout was assessed using the **Chinese version of the Copenhagen Burnout Inventory** (CBI; Yeh et al., 2008), which has demonstrated good psychometric properties in Taiwanese populations. The scale consists of four subscales: personal burnout, work-related burnout, client-related burnout, and overcommitment to work. Each item is rated on a five-point frequency scale: "always" (100), "often" (75), "sometimes" (50), "rarely" (25), and "never" (0). Subscale scores are calculated as the average of the items within each domain, ranging from 0 to 100, with higher scores indicating more severe occupational burnout. **The original validation study reported Cronbach's α values above 0.84 across all subscales (Yeh et al., 2008). In the present study, the scale demonstrated excellent internal consistency (Cronbach's α = .95).**

(8) **Resilience**:

Resilience was measured using the 10-item Resilience Scale developed and validated by Hsiao et al. (2019) for use among hospital staff in Taiwan. The scale assesses individuals' psychological capacity to adapt to and recover from stress and adversity. Each item is rated on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly

agree"), with total scores ranging from 10 to 50. Higher scores indicate greater levels of psychological resilience.

The original validation study demonstrated strong psychometric properties, including good model fit from confirmatory factor analysis (GFI = 0.973) and excellent internal consistency (Cronbach's α = .91). The authors also found that resilience levels varied by gender and years of service, highlighting the tool's sensitivity in occupational contexts.

In the present study, the scale showed excellent internal consistency (Cronbach's α = .92).

All instruments used in this study were authorized by the original developers and have been psychometrically validated in previous research. In the present study, all scales demonstrated good to excellent internal consistency, with Cronbach's α values ranging from .84 to .95.

Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics version 30.0. Continuous variables were summarized as mean ± standard deviation (SD), and categorical variables as n (%). Baseline group comparability was assessed using independent-samples *t* tests (continuous variables) and χ^2 tests (categorical variables). Variables that differed significantly at baseline ($p < .05$) were considered potential confounders; because age differed significantly between groups, it was included as a covariate in all longitudinal models.

Within-group changes from baseline (weeks 0–8) were examined using paired *t* tests. Between-group comparisons at each follow-up time point were performed using independent-samples *t* tests. For significant between-group differences, effect sizes were calculated using Cohen's *d* with 95% confidence intervals (CI), where 0.2, 0.5, and 0.8 indicated small, medium, and large effects, respectively.

To assess the longitudinal effects of the intervention, generalized estimating equations (GEE) were applied with a normal distribution, identity link, and an exchangeable correlation structure. The model included group (intervention vs. control), week (categorical: 0–8), the group × week interaction, and age as a covariate. Robust (sandwich) standard errors were used. Regression coefficients (B), standard errors, Wald χ^2 statistics, 95% CIs, and p values for group × week contrasts are reported. GEE was chosen over repeated-measures ANOVA or generalized linear mixed models because it provides population-averaged estimates, is robust to correlation misspecification, accommodates missing data under MAR/MCAR assumptions, and does not require sphericity. All tests were two-tailed with α = .05.