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## QUASI EXPERIMENTAL STUDY

# Effect of therapeutic Swedish massage on anxiety level and vital signs of Intensive Care Unit patients

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**KEYWORDS**

Anxiety;  
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**Summary Objective:** To evaluate how Swedish massage affects the level of anxiety and vital signs of Intensive Care Unit (ICU) patients.

**Methods:** Quasi-experimental study. Inclusion criteria: ICU patients, 18–50 years old, cooperative, respiratory and hemodynamic stable, not under invasive mechanical ventilation. Exclusion criteria: allergic to massage oil, vascular or orthopedic post-operative, skin lesions, thrombosis, fractures. A 30-min Swedish massage was applied once. Variables: arterial pressure, heart rate, respiratory rate, S-STAI questionnaire. Timing of evaluation: pre-massage, immediately post-massage, 30 min post-massage. Comparison: T-test, corrected by Bonferroni method, level of significance of 5%, confidence interval of 95%.

**Results:** 48 patients included, 30 (62.5%) female, mean age 55.46 (15.70) years old. Mean S-STAI pre-massage: 42.51 (9.48); immediately post-massage: 29.34 (6.37); 30 min post-massage: 32.62 (8.56),  $p < 0.001$  for all comparison. Mean vital signs achieved statistical significance between pre-massage and immediately post-massage.

**Conclusion:** Swedish massage reduced anxiety of ICU patients immediately and 30 min post-massage. Vital signs were reduced immediately post-massage.

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## Introduction

Intensive Care Unit (ICU) patients may experience emotional disorders such as loneliness, anxiety (Dunn et al., 1995) stress, pain, and fear. Such disorders may even lead to physical repercussions such as elevation of arterial blood pressure, respiratory rhythm and heart rate levels and deterioration of level of consciousness (Vahedian-Azimi et al., 2014).

Therapeutic Swedish massage has positive physiologic effects such as a decrease of sympathetic activity, vasodilatation, reduction of muscle spasm and tissue congestion, improvement of metabolites removal and pain relief. It also influences psychological status, provides relaxation and welfare, diminishes agitation, tension and anxiety (Vahedian-Azimi et al., 2014; Cassar, 2001).

Previous studies have suggested that massage can be beneficial for critically ill patients (Hill, 1993). Relaxation interventions like therapeutic touch may reduce panic, provide comfort and improve sleep quality (Gosselink et al., 2008). However, not much is known about the impact of massage on the level of anxiety and vital signs in ICU patients. Existing studies have some limitations such as subjective evaluation, utilization of more than one massage technique and massage given by a family member (Vahedian-Azimi et al., 2014; Cutshall et al., 2010).

The objective of this study is to evaluate the effect of Swedish massage on the anxiety status and vital signs of ICU patients.

## Method

This was a quasi-experimental study performed at the Central Institute of Clinics Hospital, Medical School, University of Sao Paulo, a high complexity school hospital. It was approved by the Ethics Committee for the Analysis of Research Projects of Clinics Hospital of the Faculty of Medicine of the University of Sao Paulo (process number 673.919). Data were collected from June to November 2014 at a 15-bed clinical ICU and a 17-bed post-operative ICU.

Inclusion criteria were: admission to ICU, age between 18 and 50 years old, who presented a Glasgow Coma Score of 15, hemodynamic and respiratory stability and were not under invasive mechanical ventilation. After being assessed for inclusion in the study, patients who agreed to participate were asked to sign a consent form. All participating patients were awake, alert and oriented, since Coma Glasgow Score of 15 points was an inclusion criteria, so they were able to sign the consent form by themselves.

Hemodynamic stability was defined as heart rate (HR) between 60 and 140 beats per minute, systolic arterial pressure (SAP) between 90 and 140 mmHg, diastolic arterial pressure (DAP) between 60 and 90 mmHg, without vasoactive drugs or with low and reducing doses. Respiratory stability was defined as respiratory rate (RR) between 12 and 35 breaths per minute, peripheral oxygen saturation above 90% with maximum inspired fraction of oxygen of 50% delivered by oxygen therapy.

Exclusion criteria were vascular and orthopedic post-operative, limb amputation, allergy to massage oil, burn wound, open wound, skin lesions, vascular thrombosis, allodynia, hyperalgesia.

Initial evaluation was performed immediately before receiving the massage. Then, each patient was submitted to one Swedish massage session. Patients were evaluated again immediately after receiving the massage and 30 min after massage was completed. Data collection and massage were performed by the same investigator.

Collected variables were: age, gender, cause of ICU admission, length of ICU stay from admission day until study inclusion, vital signs and anxiety status. Evaluated vital signs were: HR, RR, SAP, DAP and MAP, which were collected using DX2010 or DX2020 Dixtal multiparametric monitor (Dixtal Biomédica Indústria e Comércio LTDA, Manaus-AM, Brasil). Patient's anxiety status was evaluated by the State-Trait Anxiety Inventory for Adults (STAI) questionnaire (Spielberger et al., 1983) in the Portuguese version (Gorenstein and Andrade, 1996).

The state form of STAI questionnaire (S-STAI) was chosen, since we intended to evaluate a temporary condition of anxiety, which may vary according to the environment and/or situation. Higher score reflects greater anxiety level in a certain moment. S-STAI scale is a 20-item questionnaire that graduates the levels of anxiety. Each item of the questionnaire may score from one point ('not at all') to four points ('very much'). Ten items refer to the presence of anxiety symptoms and the other ten items reveal the absence of it. For sum score calculating, the latter items' score are inverted and then added to the score of the first ten items. The sum score ranges from 20 to 80 points and is directly related to the level of anxiety. It is usually administered as a self-completion questionnaire (Spielberger et al., 1983) but in our study, the questions were read to the patients by the same investigators.

Swedish massage was applied to the lower limbs, upper limbs and to the upper trapezius muscle, with the patient in dorsal decubitus position with a 30° elevation of the head. Swedish massage was the chosen technique because of its well-known relaxation effects. Massage was applied by the same physiotherapist and lasted 30 min. Massage sequence (Cassar, 2001) was: (1) stroking: backward and forward movement of the therapist's hands with light pressure; (2) effleurage: backward and forward movement of the therapist's hands with a medium pressure; (3) kneading: compression of the soft tissue using one hand's thumb against the other hand's fingers, alternately; (4) effleurage; (5) stroking. Each body part received one complete sequence of the Swedish massage. Hypoallergenic oil Dersani® (Saniplan, Rio de Janeiro-RJ, Brasil) was used during the massage.

Statistical analysis was carried out using statistic software R (Lucent Technologies, Murray Hill-KY, USA). Descriptive analysis was made for all collected data. Comparison of S-STAI and vital signs between the three times of evaluation was performed using paired t-test corrected by Bonferroni method, with significance level of 0.05 and confidence interval of 95%.

## Results

A total of 48 patients were included and their characteristics are displayed in Table 1. Mean age was  $55.46 \pm 15.70$  years old and cause of ICU admission show that both clinical

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