Original Article

# Foot Massage: Effectiveness on Postoperative Pain in Breast Surgery Patients

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## Abstract:

**The aim of this study was to determine the effect of foot massage on pain after breast surgery, and provide guidance for nurses in nonpharmacologic interventions for pain relief. This was a quasiexperimental study with a total of 70 patients who had undergone breast surgery (35 in the experimental group and 35 in the control group). Patients in the control group received only analgesic treatment, whereas those in the experimental group received foot massage in addition to analgesic treatment. Patients received the first dose of analgesics during surgery. As soon as patients came from the operating room, they were evaluated for pain severity. Patients whose pain severity scored ≥4 according to the Short-Form McGill Pain Questionnaire were accepted into the study. In the experimental group, pain and vital signs (arterial blood pressure, pulse, and respiration) were evaluated before foot massage at the time patients complained about pain (time 0) and then 5, 30, 60, 90, and 120 minutes after foot massage. In the control group, pain and vital signs were also evaluated when the patients complained about pain (time 0) and again at 5, 30, 60, 90, and 120 minutes, in sync with the times when foot massage was completed in the experimental group. A patient information form was used to collect descriptive characteristics data of the patients, and the Short-Form McGill Pain Questionnaire was used to determine pain severity. Data were analyzed for frequencies, mean, standard deviation, chi-square, Student *t*, Pillai trace, and Bonferroni test. The results of the statistical analyses showed that patients in the experimental group experienced significantly less pain ($p \leq .001$). Especially notable, patients in the experimental group showed a decrease in all vital signs 5 minutes after foot massage, but patients in the control group showed increases in vital signs except for heart rate at 5 minutes. The data obtained showed that foot massage in breast surgery patients was effective in postoperative pain management.**


Breast cancer remains one of the most important health problems for women. The World Health Organization (WHO) reports that an average of 460,000 people died of breast cancer in the world in 2008 (WHO, 2011). To treat breast cancer, the first

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stage of treatment is surgical intervention, especially in patients without distant metastasis. All breast surgery patients experience different levels of pain according to the type of surgery (Akyolcu, 2008; Dirksen, 2004).

Qualified postoperative pain control has an important impact on the success of surgical intervention (Dirksen, 2004). Today, however, inadequacies in the treatment and care of postoperative pain continue, despite increases in knowledge about pain pathophysiology, the availability of new drugs, and new developments in methods of drug application (Mac Lellan, 2004; Smith, 2004). Active participation of surgical nurses in the care and treatment of pain, in line with a multidisciplinary team approach, is possible if they are informed on the control of pain through pharmacologic and nonpharmacologic methods and reflect this knowledge in their practices. It should be noted that nonpharmacologic methods should be used to increase the impact of analgesics, but should not be used in their place (Yavuz, 2006).

Massage has been used in various cultures and in different styles to control pain for 3000 years (Hayes & Cox, 1999; Quattrin, Zanini, Buchini, Turello, Annunziata, Vidotti, Colombatti, & Brusaferro, 2006). Massage has formed an important part of traditional medicine, and is seen as of value, especially in Eastern countries, as a healing method that has experienced ascents and descents in popularity for centuries. Massage became especially prevalent in Europe during the Renaissance. It is experiencing a rise in its popularity with the demands of patients for special care and the increased interest in alternative therapies (Pienkowski, 2001; Wieting, Andary, Holmes, Rechtien, & Zimmerman, 2005). This circumstance has also led to an increased number of studies to determine the effectiveness and reliability of massage techniques and other nonpharmacologic methods, their effects on patient satisfaction, and their place in nursing practices (Faurot, Gaylord, & Mann, 2007; Grealish, Lomasney, & Whiteman, 2000).

The mechanism by which massage decreases pain is explained by Gate Control Theory. According to this theory, suggested by Melzack in 1965, fibers of thick tactile sense (A-alpha and A-beta) are faster than the thin fibers (A-delta and C) that transmit the sensation of pain. In this context, the mechanoreceptors and fibers of tactile sense that exist on the skin, and are stimulated through massage, stimulate the substantia gelatinosa cells (the gate closes) and lead to the inhibition of signal transmission to T cells, thus preventing the sensation of pain (Sarıoğlu & Dinçer 2003; Tuna, 2004). When cells of the substantia gelatinosa are stimulated, they secrete endorphins called endogenous opioids. Endorphins prevent the secretion of substance p, which plays a role in the transmission of pain, and blocks the transition of pain stimuli (Kanbir, 2005; Pienkowski, 2001; Tuna, 2004).

Because foot massage can be applied in a short time and easily without changing the position of the patient, it is a type of massage that is frequently used in pain control (Grealish et al., 2000; Hayes & Cox, 1999). According to the Gate Control Theory, the high density of mechanoceptors in the centers of tactile sensory fibers in the hands and feet, which are able to block sensations of pain when they are stimulated, is the reason these sites are preferred (Can, 2012; Wang & Keck, 2004).

In the literature, there have been studies to determine the effects of foot massage on pain sensation after various surgical interventions, including laparoscopic sterilization (Hulme, Waterman, & Hillier, 1999), cardiac surgery (Hattan, King, & Griffiths, 2002), abdominal surgery (Kim & Park, 2002), and cesarean section (Değirmen, Özerdogan, Sayıner, Köşgeroğlu, & Ayrancı, 2010). The present research was intended to determine the effects of foot massage on postoperative pain control in breast surgery patients.

The following hypotheses were tested in the research:

$H_0$: There is no difference in the postoperative pain severity of breast surgery patients between those receiving foot massage and those who do not.

$H_1$: Postoperative breast surgery patients receiving foot massage will have less pain than postoperative breast surgery patients without foot massage.

## METHODS

### Study Design and Sample Selection

This research was planned as a quasiexperimental study to determine the effects of foot massage on postoperative pain control in breast surgery patients. The research was carried out in the general surgery department breast service of a university hospital, in Istanbul, Turkey, from February 2007 to April 2008. Patients who had undergone excision of the mass and sentinel lymph node biopsy (E-SLNB), excision of the mass and axillary lymph node dissection (E-ALND), simple mastectomy (BM), and modified radical mastectomy (MRM) were included in the study. Seventy patients (35 in the experimental group, and 35 in the control group) as appropriate to research criteria were chosen in the sample.

The sample size was calculated by power analysis. It was calculated that ten patients were required in each group to achieve a difficulty value of 0.80, error level of 0.05, effect level of 0.25, and a difference of