Effects of Reiki on Post-cesarean Delivery Pain, Anxiety, and Hemodynamic Parameters: A Randomized, Controlled Clinical Trial

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ABSTRACT:

The aim of this study was to investigate the effect of Reiki on pain, anxiety, and hemodynamic parameters on postoperative days 1 and 2 in patients who had undergone cesarean delivery. The design of this study was a randomized, controlled clinical trial. The study took place between February and July 2011 in the Obstetrical Unit at Odemis Public Hospital in Izmir, Turkey. Ninety patients equalized by age and number of births were randomly assigned to either a Reiki group or a control group (a rest without treatment). Treatment applied to both groups in the first 24 and 48 hours after delivery for a total of 30 minutes to 10 identified regions of the body for 3 minutes each. Reiki was applied for 2 days once a day (in the first 24 and 48 hours) within 4-8 hours of the administration of standard analgesic, which was administered intravenously by a nurse. A visual analog scale and the State Anxiety Inventory were used to measure pain and anxiety. Hemodynamic parameters, including blood pressure (systolic and diastolic), pulse and breathing rates, and analgesic requirements also were recorded. Statistically significant differences in pain intensity (p = .000), anxiety value (p = .000), and breathing rate (p = .000) measured over time were found between the two groups. There was a statistically significant difference between the two groups in the time (p = .000) and number (p = .000) of analgesics needed after Reiki application and a rest without treatment. Results showed that Reiki application reduced the intensity of pain, the value of anxiety, and the breathing rate, as well as the need for and number of analgesics. However, it did not affect blood pressure or pulse rate. Reiki application as a nursing intervention is recommended as a pain and anxiety-relieving method in women after cesarean delivery.

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BACKGROUND

Postoperative pain is a very subjective phenomenon and can be felt very strongly when analgesic drugs are diminished. This pain can continue for many hours. Pain can make patients feel uncomfortable and become sleepless or anxious. Additionally, pain also stimulates the sympathetic nervous system, which causes an increase in heart rate, blood pressure (BP), sweat production, and endocrine hyperfunction, and also delays the patient’s prognosis (Edwards et al., 2008; Lee et al., 2008; VanderVaart et al., 2009). An early reduction of pain after cesarean delivery is important, as studies have shown that it negatively affects a mother’s ability to care for and breastfeed her infant. To ensure that all mothers who are recovering from cesarean deliveries and wish to breastfeed are able to do so safely, alternatives to analgesics are sought (Karlstrom, Engstrom-Olofsson, Norbergh, Sjöling, & Hildingsson, 2007; VanderVaart et al., 2011).

Several complementary and alternative medicine therapies are used to reduce pain and anxiety. In an attempt to reduce or eliminate the need for pain medication, we sought to examine the effects of Reiki on pain and anxiety. The National Center of Complementary and Alternative Medicine (NCCAM) classifies Reiki, an ancient Japanese form of hands-on healing used to reduce pain and anxiety, as an energy medicine (Bossi, Ott, & DeCristofaro, 2008; Lee, Pittler, & Ernst, 2008; Vitale, 2007; Vitale & O’Connor, 2006). The word Reiki is made up of two Japanese words: Rei, or universal spirit and ki (meaning universal life energy) (Lee et al., 2008; NCCAM, 2007). Reiki is now widely used to relieve pain, especially postoperative pain, and to facilitate patient recovery (VanderVaart, Gijsen, de Wildt, & Koren, 2009). Despite being an ancient Japanese practice, more than 1.5 million Americans practice Reiki, and its popularity is growing (Barnes, Bloom, & Nahin, 2008). However, although it is commonly practiced, there is no agreed-upon theory for how Reiki might work, and its mechanism of action is not well understood (VanderVaart et al., 2011). The existing research about the effects of Reiki reports multiple methodological problems, such as small sample size, pilot investigation, lack of a control group, and no randomization in design (Herron-Marx, Price-Knol, Burden, & Hicks, 2008; Lee et al., 2008; VanderVaart et al., 2009). Therefore, more clinical trials of higher methodological quality are needed to further study the effect of Reiki on pain and anxiety. Minimal scientific evidence in the literature demonstrates its effectiveness, but there is some suggestive evidence that Reiki can reduce pain and anxiety (Dressen & Singg, 1998; Olson, Hanson, & Michaud, 2003; Tsang, Carlson, & Olson, 2007; Vitale & O’Connor, 2006; Wardell & Engebretson, 2001) and influence vital signs (Mackay, Hansen, & McFarlane, 2004; Olson et al., 2003; Wardell & Engebretson, 2001) in humans. It may have potential as a treatment modality and a complementary and alternative therapy in health care settings (Herron-Marx et al., 2008).

It is assumed that the effects of Reiki may be explained by energy and nursing theories. Energy therapy is defined as one that focuses on energy fields within the body and electromagnetic fields outside of the body (Bossi et al., 2008; Chang, 2001b; NCCAM, 2007; Vitale, 2007). Reiki promotes overall wellness as it flows into a person’s energy system. These systems can best be described as the universal energy field and chakras. The universal energy field is a multilayered field of energy that surrounds and permeates the physical body (Anderson & Ameling, 2001; Chang, 2001a; Rand, 2005; Richeson, Spross, Lutz, & Peng, 2010; VanderVaart et al., 2009; Vitale & O’Connor, 2006). Reiki energy flows through the practitioner’s hands into these negative energy patterns of the human biofield and charges them with positive energy, elevating the vibratory level in and around the physical body. It strengthens energy pathways, or meridians, to facilitate healing in a natural way. Reiki is an energy-based touch therapy that restores energy balance and vitality throughout the body’s subtle energy system. It is blocked by stress or negative emotion (Chang, 2001b; Vitale, 2007). Ki is the vital force or energy that animates the individual. Ki touch in Oriental medicine and the concept of therapeutic touch explored in nursing literature are similar in their conceptualization of the human energy system. The physical touch, such as acupressure in Oriental medicine, Reiki, and reflexology, assume that touch functions on the energy system of the body by facilitating the circulation of energy to help the body gain vitality (Chang, 2001a, 2003).

In nursing literature, therapeutic touch, a widely recognized nursing intervention, is known as a holistic healing modality that involves the use of the hands with the conscious intent to help or heal (Chang, 2003). The work of Martha Rogers, a nursing educator, researcher, and theorist, is often advocated as a theoretical basis for nurses to use such energetic healing techniques as healing touch. Rogers’ Science of Unitary Human Beings includes recognition of the human energy field (Vitale, 2007; Vitale & O’Connor, 2006). Changes in this energy field may affect health and well-being. The North American Nursing Diagnosis
Association (NANDA) now has an approved nursing diagnosis of ‘Disturbed Energy Field, disruption in the flow of energy surrounding a person’s being that results in a disharmony of the body, mind, and/or spirit’ (Birol, 2007; NANDA, 2005; Vitale, 2007; Watson, 2010). This adds credence to the use of Reiki as part of nursing practice.

In recent years, the use of Reiki has increased among nurses and others, such as physicians and rehabilitation therapists who practice the therapy in patient care in settings such as hospitals, hospice settings, emergency departments, psychiatric settings, nursing homes, and operating rooms (Miles & True 2003; Vitale, 2007, 2009). Several studies have reported that Reiki reduced pain and anxiety. One study found that women who received Reiki post-hysterectomy reported less pain and requested fewer analgesics (Vitale & O’Connor, 2006). In the literature, the effect of Reiki on post-cesarean delivery pain and anxiety has not been studied, except for distant Reiki, and to our knowledge, there are no studies in Turkey examining the effects of Reiki on pain and anxiety. We conducted a randomized, controlled clinical trial based on the results of previous studies to evaluate the effect of Reiki on pain, anxiety, and hemodynamic parameters as well as need for analgesics after cesarean birth.

Hypotheses

1. Patients in the Reiki treatment group will have significantly less post-cesarean pain intensity than those in the control group.
2. Patients in the Reiki treatment group will have significantly less post-cesarean anxiety than those in the control group.
3. Patients in the Reiki treatment group will have a significant difference in post-cesarean hemodynamic parameters than those in the control group.
4. Patients in the Reiki treatment group will have significantly less post-cesarean analgesic need than those in the control group.

MATERIALS AND METHODS

Design
This was a randomized, controlled clinical trial. The study protocol was approved by the Ethics Committees of the School of Nursing at Ege University and Odemis Public Hospital. Each of the patients provided written and verbal informed consent before participation.

Participants
Patients hospitalized between February and July 2011 in the Obstetrical Unit at Odemis Public Hospital in İzmir, Turkey were recruited. Inclusion criteria included the following:

1. Planned or unplanned cesarean delivery
2. Turkish nationality
3. Ability to speak Turkish
4. Age between 18-45 years
5. Hospital length of stay of at least 2 days
6. Orientation to place and time
7. Operation performed under general anesthesia
8. Only using a nonopioid analgesic drug prescribed by a doctor: diclofenac 75 mg/3 mL, intramuscular.

Exclusion criteria included the following:

1. Operation performed under spinal and epidural anesthesia
2. Presence of any psychiatric disease or allergy to analgesic drugs
3. Presence of any visual and hearing impairment
4. Previous experience with Reiki
5. Serious complications with the patient or the infant(s) during or after the cesarean birth

Participants who met the inclusion criteria were instructed in the study. Patients were equalized for age (18-31, 32-45 years) and number of births (one, two, or more births). The aim of this equalizing was to control the effects of age and number of births on the results concerning Reiki and to increase the reliability of the study. At the start of the study, when a patient was selected for the experimental group, a participant of the same age and with the same number of births was included in the control group. Thus, groups were selected by age and number of births by using a random group assignment method and simple randomization technique. The experimental group (Reiki group) received Reiki for 30 minutes. The group without Reiki application (control group) was merely given a rest for 30 minutes.

Sample Size. Power analysis was used to determine sample size. Because there are no studies of the effect of Reiki on post-cesarean pain and anxiety in the literature, sample size was not based on previous studies. According to the visual analog scale (VAS) score of this study, based on 5% error and 80% power, 40 patients were required for each group for a dropout rate of 25% (mean VAS score for the control group: 4.39; mean VAS score for the Reiki group: 3.27). According to the State Anxiety Scale (SAI) score of this study, based on 5% error and 80% power, 42 patients were required for each group for a dropout rate of 15% (mean SAI score for the control group: 32.67; mean SAI score for the Reiki group: 28.67).

Study Population. One hundred three patients were eligible for participation in this study. Three patients
were excluded (did not meet inclusion criteria), and 100 patients were enrolled. Fifty patients were randomized into the Reiki group, and 50 were randomized into the control group. Ten patients withdrew from the study after randomization, and finally 90 patients were randomly divided into the Reiki and control groups (Fig. 1).

**Application**

Demographic information was collected from the patients’ medical records regarding their age, the date and time of operation, their medical diagnosis, the specific type of cesarean delivery, and names, number, and amount of doses of postoperative analgesics administered after patients were transferred to the obstetrical unit.

Treatments that were applied to the patients in the Reiki and control groups were given in the first 24 and 48 hours postsurgery for 30 minutes. Patients in the Reiki group received treatment to 10 identified regions of the body for 3 minutes each once a day for 2 days (in the first 24 and 48 hours) within 4-8 hours of the Reiki application of postoperative analgesic in the patient’s room (Fig. 2). On the other hand, patients in the control group were given a rest without treatment for 30 minutes. All patients were reassured that analgesic drugs would be administered as needed. To ensure reliability of the study results, the same researcher performed all data collection and Reiki applications. The Reiki hand positions for this study were standard hand positions (Fig. 3). The Reiki protocol constituted by Vitale and O’Connor (2006) was used in the study.

The materials used during the treatment were earplugs to provide a quiet environment, a digital watch to determine breathing rate and treatment time, and a digital BP instrument to measure BP and pulse rate.

It is known that patients experience pain in the first 3 days after cesarean delivery (Dickinson, 1999; Taskin, 2007). Because patients are discharged from the hospital where the study has been conducted on postoperative day 2, data were collected before and after discharge.

![Participant flow through study.](image)
after Reiki application in the first 24 and 48 hours post-operation. At 72 hours post-operation after discharge, only the number of analgesics used by patients was determined.

The steps in the treatment of patients in the Reiki group were as follows:

Day 1 (24 hours postoperation): Patients were given the first dose of the standard analgesic (intramuscular, 75 mg/3 mL diclofenac 2 × 1 doses at 9.00 a.m. and 9.00 p.m.) protocol followed by the nurse, after transfer from the intensive care unit to the obstetrical unit. Within 4-8 hours of this analgesic administration, the patients' demographic information, VAS, SAI, and hemodynamic parameters (BP, breathing rate, and pulse rate) were measured before Reiki treatment and recorded (first measurement). After the measurement, Reiki was applied to the patient's body for 30 minutes by the researcher. Immediately after Reiki application, the patient's VAS, SAI, and hemodynamic parameters were again measured and recorded (second measurement). Later, the time when analgesic was required after Reiki application and the number of analgesics required in the previous 24 hours were determined. When patients needed the drug, a second dose in the 24 hours postoperation was given.

Day 2 (48 hours postoperation): Patients were given the third dose of the standard analgesic (intramuscular, 75 mg/3 mL diclofenac 2 × 1 doses at 9.00 a.m. and 9.00 p.m.) protocol followed by the nurse. Within 4-8 hours of this analgesic administration, the patients' VAS, SAI, and hemodynamic parameters were measured before Reiki treatment and recorded (third measurement). After the measurement, Reiki was applied to the patient's body for 30 minutes by the researcher. Immediately after Reiki application, the patient's VAS, SAI, and hemodynamic parameters were again measured and recorded (fourth measurement). Later, the time when analgesic was required after Reiki application and the number of analgesics required in the previous 48 hours was determined.

Day 3 (72 hours postoperation): Minoset 500 mg, tablet 3 × 1 (every 4-6 h, as needed) was administered according to the analgesic protocol, and at 72 hours only the number of analgesics required by the patient was determined by face-to-face interview or telephone call.

For the control group, exactly the same procedure was applied as to the Reiki group, except that they received no Reiki treatment, and instead were allowed to rest in their beds for 30 minutes.
Outcome Measures

Pain Intensity. Pain intensity was measured by using a horizontal VAS ranging from 0-10, with higher numbers meaning greater pain intensity. The VAS was used to measure the intensity of pain experienced by the patients before and after the application.

Anxiety. Anxiety was measured using the State-Trait Anxiety Inventory (STAI) developed by Spielberger in collaboration with Gorsuch et al. in 1968 and 1977. This instrument has been widely used in stress-related research (Wardell & Engebretson, 2001). The concurrent validity of STAI was established in Turkey by Oner in 1977 (Oner, 2006). The STAI is designed to differentiate between the temporary condition of state anxiety and the more general and long-standing quality of trait anxiety in adults. SAI evaluates feelings of apprehension, tension, nervousness, and worry, which increase in response to physical danger and psychological stress at the time of stress. The 20-question test allows individuals to respond on a 4-point Likert-type scale in 10 minutes (Vitale, 2007). The SAI was used to measure the value of anxiety experienced by the patients before and after Reiki application.

Patient Follow-up Form. The form was devised by the investigators and included measurements of hemodynamic parameters and the number and time (hours) of analgesics. This form was used to record the measurements before and after Reiki application.

Statistical Analysis. Power analysis was used to determine sample size. Using the VAS and SAI to distinguish results between the applications with a power of 80%, and to achieve the difference between the time periods evaluated with a power of 100%. It was determined that a sample size of 90 (45 each for the Reiki and control group) was sufficient for this study. Data analysis was performed using SPSS 16.0 statistical software. Numbers, percentages, and χ² were used to evaluate the homogeneity of patients’ demographic characteristics. Repeated measure analyses of variance were used to compare the mean score of VAS, SAI, and hemodynamic parameters for all of the measures in the Reiki and control groups. Paired sample t test was used to compare the mean score of VAS, SAI, and hemodynamic parameters between the first and second measurements and between the third and fourth measurements in the same group. Friedman and Mann-Whitney U tests were used to compare the time of analgesics required in the Reiki and control groups. Friedman, Mann-Whitney U, and paired Wilcoxon two-sample tests were used to compare the number of analgesics required in the Reiki and control groups. In the evaluation of data, a 95% confidence interval and p < .05 were adopted as statistically significant.
RESULTS

The age of the study participants ranged from 18-45 years (mean 27.61, SD 4.77 years). The study sample consisted of 35 women at first birth (38.9%) and 55 women at second or more births (61.1%). There was no significant difference in demographic or clinical characteristics between the two groups ($p > .05$).

Pain Intensity: VAS

Table 1 presents variations in mean VAS scores between the two groups according to application times. In both groups, a statistically significant difference was found between pain intensity in the measurements 1-4, which were measured on postoperative days 1 and 2 ($p < .05$). A rate of 66.75% reduction was found in pain intensity between the first and fourth measurements. A reduction in pain intensity was observed between the first and second measurements ($p < .05$), and between the third and fourth measurements ($p < .05$) in the Reiki group, but there was no significant difference in the control group ($p > .05$) (Fig. 4).

There was no statistically significant variation in difference of perceived pain intensity when analyzed according to variables such as age or number of births in the Reiki group ($p < .05$).

Anxiety: SAI

Table 1 presents change of anxiety values between the two groups according to application times. In both groups, a statistically significant difference was found between the anxiety values in all four measurements ($p < .05$). A rate of reduction in anxiety values of 29.61% was found between the first and fourth measurements in the Reiki group. A reduction in the anxiety values was observed between the first and the second measurements ($p < .05$), and between the third and fourth measurements ($p < .05$) in Reiki the group, but in the control group there was no significant difference ($p > .05$) (Fig. 5).

Hemodynamic Parameters

Table 2 presents changes in mean breathing rates, pulse rates, and systolic (SBP) and diastolic (DBP) BP scores between the two groups according to application times. In both groups, a statistically significant difference was found between breathing rate in all measurements ($p < .05$). A reduction in breathing rate was observed between measurements 1 and 2 ($p < .05$),

### Table 1.
Means and SDs of VAS Scores and Anxiety Values

<table>
<thead>
<tr>
<th>Application Time</th>
<th>Reiki Group</th>
<th>Control Group</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.73 (1.67)</td>
<td>4.13 (1.39)</td>
<td>$F = 25.183$</td>
</tr>
<tr>
<td>2</td>
<td>2.06 (1.20)</td>
<td>4.26 (1.62)</td>
<td>$p = .000^*$</td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2.75 (1.60)</td>
<td>3.69 (1.68)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1.24 (0.99)</td>
<td>3.76 (1.61)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$F = 49.211; p = .000^*$</td>
<td>$F = 4.376; p = .006^*$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>33.91 (5.30)</td>
<td>33.51 (33.51)</td>
<td>$F = 47.807$</td>
</tr>
<tr>
<td>2</td>
<td>25.58 (6.30)</td>
<td>33.78 (6.60)</td>
<td>$p = .000^*$</td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>31.44 (5.30)</td>
<td>32.56 (5.72)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>23.87 (6.66)</td>
<td>32.87 (6.25)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$F = 77.387; p = .000^*$</td>
<td>$F = 1.657; p = .179$</td>
<td></td>
</tr>
</tbody>
</table>

VAS = visual analog scale.

Measurement 1: time before application on the first day; measurement 2: after application on the first day; measurement 3: before application on the second day; Measurement 4: after application on the second day.

*p < .05.
and between measurements 3 and 4 ($p < .05$) in the Reiki group, there was no significant difference in the control group ($p > .05$). On the other hand, no statistically significant difference was found between mean pulse rate and SBP and DBP scores in any of the measurements in either group ($p > .05$). No change in mean pulse rate or SBP or DBP scores was obtained from the measurements between measurements 1 and 2 ($p > .05$), or between measurements 3 and 4 ($p > .05$) in the two groups.

**Analgesic Needs of Patients**

There was a statistically significant difference in the time when analgesics were needed after applications between the two groups ($p < .05$). On days 1 and 2 after Reiki application, the Reiki group needed analgesics later than the control group ($p < .05$; Table 3). There was a statistically significant difference in the number of analgesics required after the applications between the two groups ($p < .05$). On the days 1, 2, and 3 after Reiki application, the Reiki group needed fewer analgesics than the control group ($p < .05$). It was observed that the Reiki group needed progressively fewer analgesics ($p < .05$; Table 4).

**DISCUSSION**

This study measured women’s pain intensity, anxiety values, and hemodynamic parameters after cesarean delivery. The study demonstrated beneficial effects of Reiki application over usual care on the reduction of pain, anxiety, and breathing rate as well as the patients’ analgesic needs for 3 days post-cesarean section.

**Pain**

According to the results obtained in this study, Reiki application was effective in relieving the pain associated with cesarean birth. This result may be explained by the Ki theory (Chang, 2001b, 2003). Reiki is based on the assumption that touch accesses the energy system of the human body and facilitates the circulations of energy and physical comfort, thus increasing bodily vitality and promoting health (Chang, 2001b). We found only one study related to the effect of Reiki on pain associated with cesarean delivery. The same was unable to demonstrate the effect of distant Reiki on post-cesarean pain (VanderVaart et al., 2011). These findings are not in agreement with the result of the present study regarding the reduction of pain by Reiki. The conflict may be explained by differences in the parameters of the current study: not distant Reiki, appropriately powered sample size, and analgesic protocol, as opposed to those in the VanderVaart et al. (2011) study. But studies of different sample populations were found on the effect of Reiki application on pain in patients with cancer (Aghabati, Mohammadi, & Esmaiel, 2010; Olson et al., 2003; Tsang et al., 2007), paraplegia (Pocotte & Salvador, 2008), and abdominal hysterectomy (Vitale & O’Connor, 2006). In both laboratory and clinical research, it has been suggested that Reiki application for pain management causes a reduction in pain intensity (Fazzino, Griffin, McNulty, & Fitzpatrick, 2010; Vitale, 2007). In this context, Reiki application can be an especially important complementary and alternative therapy or nonpharmacologic nursing intervention for pain management.

Factors such as age, sex, and culture may affect pain perception (Wentz, 2009; Yavuz, 2006). In the present study, however, age and number of births were not found to be significant variables.

**Anxiety**

A statistical difference was seen in this study in the variation of anxiety of patients between the two groups. In the Reiki group, a reduction in anxiety values was observed after treatment. In the literature, it is found that Reiki application provides relaxation and a reduction in stress and anxiety (VanderVaart et al., 2009;
Additionally, Reiki has physical and emotional explanations (Chang, 2001a, 2003; Fazzino et al., 2010; Vitale & O’Connor, 2006; Wardell & Engebretsone, 2001). There were no studies related to the effect of Reiki on anxiety associated with post-cesarean delivery in the literature. However, the effect of Reiki on anxiety has been examined in different sample populations. It has been demonstrated that Reiki treatment reduces patient anxiety (Dressen & Singg, 1998; Cassidy, Collins, Cyr, & Magni, 2010; Tsang et al., 2007; Vitale & O’Connor, 2006; Wardell & Engebretsone, 2001).

### Hemodynamic Parameters

This study demonstrated a reduction in breathing rate after Reiki application in the experimental group compared to the control group. The results are summarized in Table 2:

<table>
<thead>
<tr>
<th>Application Time</th>
<th>Reiki Group</th>
<th>Control Group</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breathing Rate</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Measurement 1</td>
<td>20.09 (1.90)</td>
<td>19.24 (1.15)</td>
<td>$F = 25.082$</td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Measurement 2</td>
<td>18.37 (1.58)</td>
<td>19.11 (1.19)</td>
<td>$p = .000^*$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Measurement 3</td>
<td>19.51 (1.76)</td>
<td>19.00 (1.31)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Measurement 4</td>
<td>18.36 (1.55)</td>
<td>19.04 (1.31)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p &lt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Pulse Rate</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement 1</td>
<td>77.24 (12.15)</td>
<td>82.36 (13.36)</td>
<td>$F = 0.524$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Measurement 2</td>
<td>78.89 (12.13)</td>
<td>83.38 (13.77)</td>
<td>$p = .666$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Systolic blood pressure (mm Hg)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Test</td>
</tr>
<tr>
<td>Measurement 1</td>
<td>121.29 (13.41)</td>
<td>122.33 (11.48)</td>
<td>$F = 0.141$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Measurement 2</td>
<td>119.49 (12.64)</td>
<td>121.67 (14.87)</td>
<td>$p = .936$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Diastolic blood pressure (mm Hg)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Test</td>
</tr>
<tr>
<td>Measurement 1</td>
<td>67.53 (10.18)</td>
<td>67.87 (11.67)</td>
<td>$F = 0.679$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
<tr>
<td>Measurement 2</td>
<td>67.27 (9.70 )</td>
<td>67.89 (11.82)</td>
<td>$p = .565$</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
<td>$p &gt; .05$</td>
<td></td>
</tr>
</tbody>
</table>

Measurement 1: time before application on the first day; measurement 2: after application on the first day; measurement 3: before application on the second day; measurement 4: after application on the second day.

*p < .05.
group, but no change was observed in mean pulse rate or SBP or DBP scores. In the literature, it is observed that Reiki provides relief and reduced stress and tension for patients, and has a positive effect on physiologic parameters (Mackay, Hansen, & McFarlane 2004; Miles & True, 2003; Olson et al., 2003; Wardell & Engebretsone, 2001). Additionally, there are many studies related to the effect of Reiki application on hemodynamic parameters (Cassidy et al., 2010; Friedman, Burg, Lee, & Lampert, 2010; Lee et al., 2008; Mackay et al., 2004; Miles & True, 2003; Olson et al., 2003; VanderVaart et al., 2011). These studies found different results on this topic. In the present study, it was found that Reiki provided a positive effect on the reduction of breathing rate because it induces patient calmness, relaxation, and a peaceful feeling, thus reducing pain and anxiety, and inducing sleepiness. One factor may be that, in this study, Reiki had no effect on patient pulse rate, SBP, or DBP after cesarean delivery, but these parameters remain at a stable level and within physiologic limits.

This study found that the Reiki group needed an-algesics at a later time, and there was a progressive reduction in the need for analgesics compared with the control group, possibly owing to decreased pain perception. Thus, the need of patients for fewer analgesics reduced the cost of care and exposure to the side effects of these agents. The literature and previous studies found that Reiki reduces the use of analgesics and prolongs the length of time between analgesic doses (Alandydy & Alandydy, 1999; Fazzino et al.,

### Table 3.
Distribution of Mean Length of Time (Hours) Until the Next Analgesic Received after the Application

<table>
<thead>
<tr>
<th>Application Day</th>
<th>Reiki Group</th>
<th>Control Group</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Med (IQR)</td>
<td>Min-Max</td>
<td>U/p</td>
</tr>
<tr>
<td>1</td>
<td>6.00 (3.00)</td>
<td>2-24</td>
<td>375.500</td>
</tr>
<tr>
<td>2</td>
<td>8.00 (7.00)</td>
<td>6-36</td>
<td>241.000</td>
</tr>
<tr>
<td>Test</td>
<td>$\chi^2 = 25.600; p = .000^*$</td>
<td>$\chi^2 = 11.111; p = .001^*$</td>
<td></td>
</tr>
</tbody>
</table>

IQR = interquartile range.

*p < .05.

### Table 4.
Number of Analgesics Required after Application

<table>
<thead>
<tr>
<th>Application Day</th>
<th>Reiki Group</th>
<th>Control Group</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Med (IQR)</td>
<td>Min-Max</td>
<td>U/p</td>
</tr>
<tr>
<td>1</td>
<td>2.00 (0.00)</td>
<td>1-2</td>
<td>562.500</td>
</tr>
<tr>
<td>2</td>
<td>1.00 (0.00)</td>
<td>0-2</td>
<td>541.000</td>
</tr>
<tr>
<td>3</td>
<td>1.00 (2.00)</td>
<td>0-3</td>
<td>326.500</td>
</tr>
<tr>
<td>Test and significane level</td>
<td>$\chi^2 = 35.338; p = .000^*$</td>
<td>$\chi^2 = 25.426; p = .000^*$</td>
<td></td>
</tr>
</tbody>
</table>

IQR = interquartile range.

*p < .05.
CONCLUSIONS

This study demonstrated that Reiki application reduced pain intensity, the value of anxiety, and breathing rate, as well as analgesic requirements post-caesarean delivery; however, it did not affect pulse rate, SBP, or DBP. Reiki application, a complementary therapy or a nonpharmacologic intervention, is recommended as a pain and anxiety relief method after caesarean delivery.

Reiki is noninvasive, has no known side effects, has no negative effects on existing treatments or therapy, and is inexpensive. Nurses can become attuned and provide Reiki to their patients frequently at no cost (Crawford, Leaver, & Mahoney, 2006; Thrane & Cohen, 2014). Therefore, nurses can use Reiki as part of the application of nonpharmacologic therapeutic interventions for pain management. Future studies should investigate the effects of Reiki application combined with different complementary therapies, nonpharmacologic therapeutic methods, and sham Reiki.

Limitations

The Reiki application to patients was not administered in a private room. Patients’ perceptions of pain intensity and anxiety can be affected by environmental factors such as the sound of their babies and other patients in the room, and treatment being administered to other patients.

REFERENCES


German Reiki Clinical Trials


