

Effectiveness of Reiki therapy for preoperative anxiety in cardiac surgery: a randomized clinical trial

Efetividade da terapia Reiki para ansiedade pré-operatória na cirurgia cardíaca: ensaio clínico randomizado
Efectividad de la terapia de *reiki* para ansiedad preoperatoria en cirugía cardíaca: ensayo clínico aleatorizado

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Descriptores

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Abstract

Objective: To assess the effectiveness of a Reiki protocol on anxiety levels in the preoperative period of cardiac surgery.

Methods: This is a controlled and randomized clinical trial carried out in a university reference hospital in cardiology between June and December 2021. Chunk randomization and allocation by draw with opaque sealed envelopes were carried out in two groups: Control (n=44; not subjected to intervention); and Intervention (n=44; submitted to two Reiki sessions three days before and the day before surgery). The main outcomes (anxiety, well-being and muscle tension) were assessed across sessions using a mixed effects model. To assess the effect size, partial *eta* squared (η^2p) values were calculated.

Results: Differences in anxiety scores (+2.7 points more than the control), well-being (-0.78) and muscle tension (1.27) were determined, being considered statistically significant ($p<0.001$). In analyzing the effect size, the experiment better distinguished the variation in the anxiety variable ($\eta^2p=0.74$) than in the other two variables ($\eta^2p=0.14$; $\eta^2p=0.23$).

Conclusion: The study offers favorable evidence for the effectiveness of Reiki in controlling preoperative anxiety after cardiac surgery.

Resumo

Objetivo: Avaliar a efetividade de um protocolo de Reiki nos níveis de ansiedade no período pré-operatório de cirurgia cardíaca.

Métodos: Ensaio clínico controlado e randomizado realizado em um hospital universitário de referência em cardiologia entre junho e dezembro de 2021. Foi realizada randomização em bloco e alocação por sorteio com envelopes selados opacos em dois grupos: Controle (n=44; não submetido a intervenção) e Intervenção (n=44; submetido a duas sessões de Reiki três dias antes e na véspera da cirurgia). Os desfechos principais (ansiedade, bem-estar e tensão muscular) foram avaliados ao longo das sessões usando um modelo de efeitos mistos. Para avaliar o tamanho do efeito foram calculados os valores parciais de *eta* quadrado (η^2p).

Resultados: Foram determinadas as diferenças nos escores de ansiedade (+2,7 pontos a mais para o controle), bem-estar (-0,78) e tensão muscular (1,27), sendo consideradas estatisticamente significativas ($p<0,001$). Na análise do tamanho do efeito, o experimento distinguiu melhor a variação na variável ansiedade ($\eta^2p=0,74$) que nas outras duas variáveis ($\eta^2p=0,14$; $\eta^2p=0,23$).

Conclusão: O estudo oferece evidência favorável para efetividade do Reiki no controle da ansiedade pré-operatória de cirurgia cardíaca.

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Conflict of interest: nothing to declare.

Resumen

Objetivo: Evaluar la efectividad de un protocolo de *reiki* en los niveles de ansiedad en el período preoperatorio de cirugías cardíacas.

Métodos: Ensayo clínico controlado y aleatorizado, realizado en un hospital universitario de referencia en cardiología entre junio y diciembre de 2021. La aleatorización se realizó por bloques y la asignación por sorteo con sobres cerrados opacos en dos grupos: Control (n=44, sin intervención) y Experimental (n=44, sometidos a dos sesiones de *reiki*, una tres días antes y otra en la víspera de la cirugía). Los criterios de valoración principales (ansiedad, bienestar y tensión muscular) fueron evaluados a lo largo de las sesiones, mediante un modelo de efectos mixtos. Para evaluar el tamaño del efecto se calcularon los valores parciales de *eta* cuadrado (η^2p).

Resultados: Se observaron diferencias en la puntuación de ansiedad (+2,7 puntos más en el grupo de control), bienestar (-0,78) y tensión muscular (1,27), consideradas estadísticamente significativas ($p < 0,001$). En el análisis del tamaño del efecto, el estudio percibió mejor la variación en la variable ansiedad ($\eta^2p = 0,74$) que en las otras dos variables ($\eta^2p = 0,14$; $\eta^2p = 0,23$).

Cirugía: El estudio ofrece evidencias favorables para la efectividad del *reiki* en el control de la ansiedad preoperatoria de cirugías cardíacas.

Brazilian Clinical Trials Registry: RBR-2nhgvn6

Introduction

Reiki therapy is classified as bioenergetic, being included among Integrative and Complementary Practices (ICP).⁽¹⁻³⁾ Reiki comes from ancestral therapies in Tibet and resurfaced in its current configuration in Japan (20th century) when Mikai Usui studied ancient Tibetan healing practices. It spread in the United States in the 1930s and in Europe only in the 1980s.^(2,3) Possibly, the term Reiki comes from an idiomatic expression that means *universal vital energy*.^(2,3)

Although Reiki is not a classic biomedical intervention, systematic reviews have shown that this therapy can be useful for various symptoms (level of pain, anxiety, depression), generally complementing, or even replacing biomedical interventions (such as drug use), although they make clear the need for more well-designed studies with critical assessment of methodological quality to detect the effectiveness of the technique.⁽²⁻⁵⁾

In general, these reviews suggest that Reiki can reduce preoperative stress, recovery times and hospital stays, and even pain and analgesia use; however, the quality of studies in this area has been considered average.⁽²⁻⁵⁾ These reviews lack clinical trials to assess the effectiveness of the therapy in cardiac surgery, validating its usefulness in promoting benefits to patients in coping with or recovering from surgery.

Regarding perioperative anxiety, there is research that presents significant results for its reduction or control through Reiki, but there are no

studies in cardiac surgery.⁽⁶⁻⁹⁾ In this research, Reiki was defined as the object of study, as a non-pharmacological intervention to alleviate anxiety in the preoperative period of cardiac surgery. The guiding question of this research is the following: *How effective is Reiki in reducing anxiety in adult and older patients in the preoperative period of heart surgery?*

The main objective of this study was to assess the effectiveness of a Reiki protocol on anxiety levels in the preoperative period of cardiac surgery.

Methods

This is an experimental clinical trial, prospective, randomized and controlled, with two arms (parallel and single-blind). The study was carried out in surgical inpatient units of a specialized university hospital (a reference cardiology center in northeastern Brazil) between June and December 2021. The report presented followed the CONSORT Statement for Randomized Trials of Nonpharmacologic Treatments.⁽¹⁰⁾ To carry out this research, a pilot study was previously carried out.⁽¹¹⁾

In this study, patients participated in the pre-operative period of cardiac surgery for myocardial revascularization and valve replacement (or repair), with up to three days until the date of surgery. Patients aged over 18 years were included, with pre-operative risk assessment classified as low or medium by the Euroscore pre-operative risk score (0-5 points).⁽¹¹⁾ Patients scheduled for urgent or emergency surgery, combined surgeries and min-

imally invasive surgeries, using antipsychotics and anxiolytics, with neurological, mental and cognitive changes that could prevent them from answering the questions were not included.

When assessing the main outcome, anxiety, the sample size was calculated considering values above 2 on the visual analogue scale between groups as the superior result, and the expected deviation in the population was ± 2.5 . To achieve a power to detect a real effect of 80% ($1-\beta$) and a type I error (probability of detecting a false positive effect) of 5% with equal allocation between groups (1 control for 1 Reiki), the sample was calculated at 43 patients per group. In the end, 44 patients were included in each group, totaling 88 patients.

The researchers approached patients in the wards, first consulting their medical records to check whether they met the clinical criteria to participate in the research. Patients were only included in the study when they were on the third day before the date of surgery, and the intervention was applied with an interval of ≥ 1 day. After randomization by drawing lots with sealed opaque envelopes, patients were allocated to the indicated group, with the groups being parallel (i.e., without crossing over).

Although in the area of ICP there is a consensus that treatments are individualized, in this study the Reiki technique was standardized per session as well as the number of sessions (two), intervals between sessions, duration of each session (min: 10 min; max.: 20 min).^(1,12) Session duration varied depending on patients' preparation, succinct prior guidance, including doubts that might arise later. This control aimed to minimize the effect of the applicator on the technique, which could be considered a possible performance bias, causing variation in intervention delivery during the applicator-patient relationship at the time of the session.^(1,12)

The application of Reiki followed a standardized protocol: after positioning patients, practitioners performed energetic cleansing of the environment and applied Reiki to the ventral part and to the frontal, laryngeal, cardiac, solar plexus and umbilical energy centers (mean time: 3 min per energy center; mean planned session time: 20 min). No other resources were used, such as stones, pillows,

aromas, music, etc. After the session, no guidance was given on practices such as meditation, etc.

In the control group, participants did not undergo the Reiki intervention. Initially, they were assessed on the 3rd day before surgery. They were then assessed in the 24 hours before the scheduled surgery. In the Reiki group, participants were taken to a separate ward (or received the intervention in their own bed, if they wished so).

In the Reiki group, pre- and post-intervention assessments were the same as those carried out in the control group. The four assessments were as follows: T1 (before the first session), T2 (after the first session), T3 (before the second session) and T4 (after the second session).

The three volunteer Reikians (two men and one woman) had the same training in the technique: Reiki (traditional Usui method; level 2), with at least three years of training. The applicators were not qualified in other integrative practices, and were instructed to use only Reiki, as the association between Reiki and another practice could enhance the results.⁽¹¹⁻¹⁴⁾

A statistical professional generated a randomization list with randomization in chunks of ten out of ten patients stratified in the proportion of one woman for every two men, as studies have shown that anxiety presents differently between genders. Stratified randomization was chosen to ensure homogeneous distribution between men and women in both groups. A randomization list was created using the R software (Windows T.S., v. 3.0.3). The statistical professional released a list with a chunk of 10 positions and the responsible researcher randomly selected patients according to the chunk, using sealed opaque envelopes.

To avoid performance bias, an independent statistician received the database without identifying the groups to perform analysis, being masked during the analysis so as not to know which group he was attributing the results to.

It was previously defined that participants who did not receive the intervention twice would be excluded from the sample. According to the study protocol, patients would be discontinued if they learned of the postponement of surgery before participating in both treatments.

All patients were assessed, and information was collected about sex, age, origin (capital, metropolitan region or state countryside), income, education, experience of previous heart surgery and cancellation of surgery. Before approaching patients, Euroscore (pre-operative risk assessment for cardiac surgery), comorbidities (overweight or obesity, hypertension, diabetes, dyslipidemia, chronic kidney disease, smoking, chronic or social alcoholism – occasional), length of hospital stay and pre-operative time were collected previously in the medical record.

All independent variables were assessed before intervention, and the main outcomes considered here (anxiety, well-being and muscle tension scores) were assessed before and after each session. No cut-off point was used in the scores for inclusion in the research.

In the control group, the assessment at each meeting followed the following sequence: assessment of main outcomes, interview about study variables and new assessment of the same outcomes. In the Reiki group, the same sequence was performed before and after each session. In the end, both groups had four assessments of main outcomes (anxiety, well-being and muscle tension).

Data were collected using an instrument developed by the authors, divided into three parts. The first part consisted of a questionnaire designed for sociodemographic survey and surgery data. The second part contained the record of outcome results before and after each session, consisting of the following scales: Visual Analogue Anxiety Scale (VAS), Visual Analogue Scale of Perceived Well-Being (EAPBE - *Escala Analógica de Percepção de Well-being*) and Perceived Muscle Tension Analogue Scale (EAPTM - *Escala Analógica de Muscle tension perception*).⁽¹⁴⁻¹⁹⁾

The VAS was used to measure anxiety levels. The VAS has been validated to assess preoperative anxiety. We ask patients to mark their level of anxiety along a horizontal line (scale 0-10; 0: no anxiety; 10: highest possible anxiety).⁽¹⁴⁻¹⁹⁾

The EAPBE was used by patients to indicate the level of well-being perceived at the moment (0: worst possible well-being; 10: best possible well-being perception).⁽¹⁴⁾

The EAPTM was used on patients to indicate their muscle tension perception (0: no muscle tension perception; and 10: maximum muscle tension perception).⁽¹⁴⁾

The outcomes were questioned without prior presentation of a construct definition, with only the following being requested: “Mark how you perceive your anxiety (or your muscle tension or your well-being) in relation to the surgery”. The third part of the form was made up of a space to record sessions, patient perceptions or complaints.

The collected data were stored in a database for later analysis in SPSS (v. 20.0) and R (v. 4.1.2) software. During statistical analysis, the evaluator was masked so as not to know which group he was attributing the results to.

Normality in the distribution of the main outcome variables was confirmed by assessing residual normality via quantile-quantile (QQ) graph. As normal distribution was confirmed, parametric tests were used to compare groups.

The Linear Mixed Model was adjusted, which allows describing the trend as a function of multiple observations in time (longitudinal), considering the existing correlation between successive means and estimating the variation in baseline measurement and the change over time. The main outcomes (anxiety, well-being and muscle tension) were assessed throughout the sessions using a mixed effects model: (1) main effect of time (to assess whether there was a change in the mean over time, regardless of group); (2) main effect of group (to assess whether there was a difference between the control and Reiki groups over time); and (3) time x group interaction effect (to assess whether the change between the means over time occurred in the same way between the two groups).

To assess the effect size of these comparisons, partial *eta* squared values (η^2p) were calculated, considering the following references: irrelevant (<0.02), small ($0.02 \leq p \leq 0.12$); moderate ($0.13 \leq m \leq 0.25$) and large (≥ 0.26).⁽²⁰⁾ A statistical significance level of 0.05 was adopted.

This study was prepared according to CNS Resolution 466/2012 precepts, being submitted for consideration by the Research Ethics Committee of

the institution (Opinion 4.487.300/2020) where the data were collected.

Results

The sample consisted of 88 patients, who were divided into two groups: control (n=44) and intervention (Reiki; n=44). Figure 1 presents the sample composition flowchart for both groups.

Twenty patients who entered the surgical map were not allocated to any of the groups because they were awaiting cardiac surgery outside the scope of research. There were 12 refusals, nine of which were from patients referred for intervention. Nine patients were excluded because they were unable to participate in the second session, four due to clinical complications (two from each group) and five (three from the control group and two from the Reiki group) because they found out about the postponement of surgery before the session. The rates of refusal, randomization, loss to follow-up and study com-

pletion were similar in both groups ($p < 0.05$). In both groups, most patients were men (according to chunk randomization) aged 60-69 years, from the state countryside, with no work activity, with more than five years of education and income of up to two minimum wages. No significant difference was observed between the control and Reiki groups for the presence of comorbidities, patient experience in relation to heart surgery (majority undergoing first heart surgery). Patients in both groups had approximate mean age ($p = 0.861$) and Euroscore values ($p = 0.459$). There was also no difference between the groups for length of stay ($p = 0.940$) and time spent waiting for surgery ($p = 0.857$). Table 1 presents descriptive statistics for anxiety, well-being and muscle tension perception before and after each interview session for the control or Reiki groups.

Figure 2 presents the behavior of dependent variables in the four measurements between groups at the four moments: T1 (before the first session), T2 (after the first session), T3 (before the second session) and T4 (after the second session).

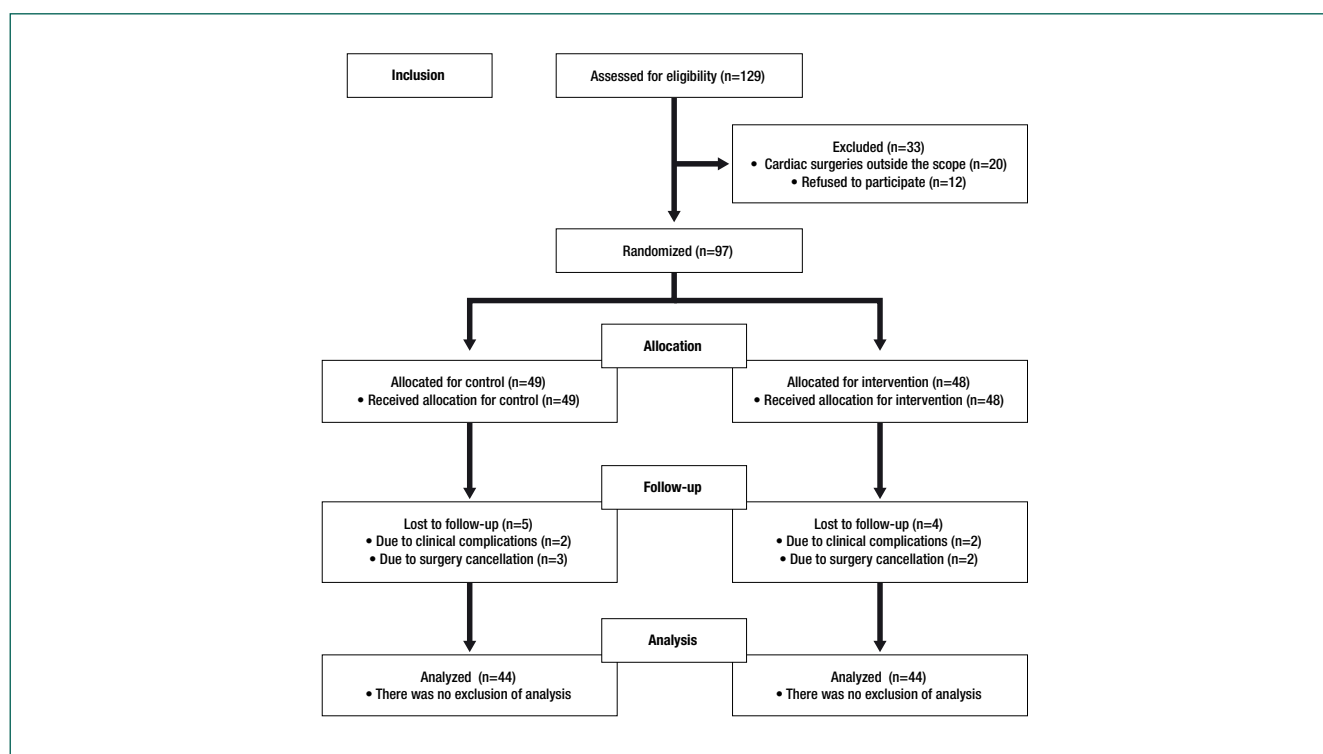


Figure 1. Clinical trial flowchart according to CONSORT

Table 1. Descriptive statistics of anxiety, well-being and muscle tension perception before and after each session for control (C; n=44) and Reiki (R; n=44) groups

Anxiety	Group	Mean	Standard deviation	95% CI	Min	Max	Mean difference
1 st Session	Pre	C	6.2	0.92	5.9-6.5	4	0.45
		R	6.2	0.94	5.8-6.4	4	
	Post	C	6.1	0.92	5.8-6.3	4	1.02
		R	5.1	0.94	4.8-5.4	3	
	2 nd Session	C	7.9	1.10	7.6-8.2	5	0.64
		R	7.3	0.80	7.0-7.5	5	
2 nd Session	Post	C	8	1.00	7.7-8.3	5	2.7
		R	5.3	0.90	5.0-5.6	3	
Well-being	Group	Mean	Standard deviation	95% CI	Min	Max	Mean difference
1 st Session	Pre	C	6.2	1.12	5.8-6.5	4	0.09
		R	6.3	1.18	5.9-6.6	4	
	Post	C	6.5	0.95	6.2-6.8	5	-0.2
		R	6.7	0.93	6.4-7.0	5	
	2 nd Session	C	5.4	0.99	5.0-5.7	3	-0.27
		R	5.7	0.89	5.4-5.9	4	
2 nd Session	Post	C	5.5	1.05	5.-5.8	3	-0.78
		R	6.3	0.84	5.9-6.5	5	
Muscle tension perception	Group	Mean	Standard deviation	95% CI	Min	Max	Mean difference
1 st Session	Pre	C	6.0	0.93	5.7-6.3	4	<0.01
		R	6.0	1.04	5.7-6.3	4	
	Post	C	6.1	1.14	5.7-6.4	4	0.5
		R	5.5	0.73	5.3-5.8	4	
	2 nd Session	C	7.4	1.35	6.3-6.9	5	0.86
		R	6.6	0.97	7.0-7.8	4	
2 nd Session	Post	C	6.6	0.90	6.3-6.8	4	1.27
		R	5.3	0.96	5.0-5.6	3	

95% CI: 95% confidence interval

Analysis using the mixed effects model throughout sessions showed different behavior between groups for anxiety, well-being and muscle tension (interaction effect of time x group), with statistical significance ($p<0.001$ for the three variables). Figure 2 shows that after applying the protocol

there were differences between anxiety (2.7 points more for the control), well-being (0.78 less for the control) and muscle tension scores (1.27 points more for control); all of them were considered significant ($p<0.001$). Analysis showed that, as surgery approached, there was an increase in anxiety and muscle tension, and a decrease in well-being in both groups. In the Intervention group, the final anxiety measure was lower than the initial one (with statistical significance) after applying the two-session protocol. For anxiety, the effect of the time x group interaction was considered large ($\eta^2p=0.74$), showing that the groups evolved differently throughout sessions. For well-being ($\eta^2p=0.14$) and muscle tension ($\eta^2p=0.23$), effect sizes were moderate ($\eta^2p=0.14$; $\eta^2p=0.23$, respectively), showing that the experiment distinguished better for the anxiety variable than for the others (Table 2).

Finally, Pearson correlation analysis was performed between the dependent variables. This analysis revealed that anxiety and perceived tension are positively correlated ($r=0.82$; 95% CI: 0.79-0.85; $p<0.001$) and that anxiety and well-being are inversely correlated ($r=-0.79$; 95% CI: -(0.83-0.75); $p<0.001$). During the sessions, crying was recorded from patients in the control ($n=3$) and intervention ($n=2$) groups, everyone during the interviews. Drowsiness was only recorded in patients in the intervention group ($n=5$). No discomfort or other negative symptoms were recorded by any patient in either group.

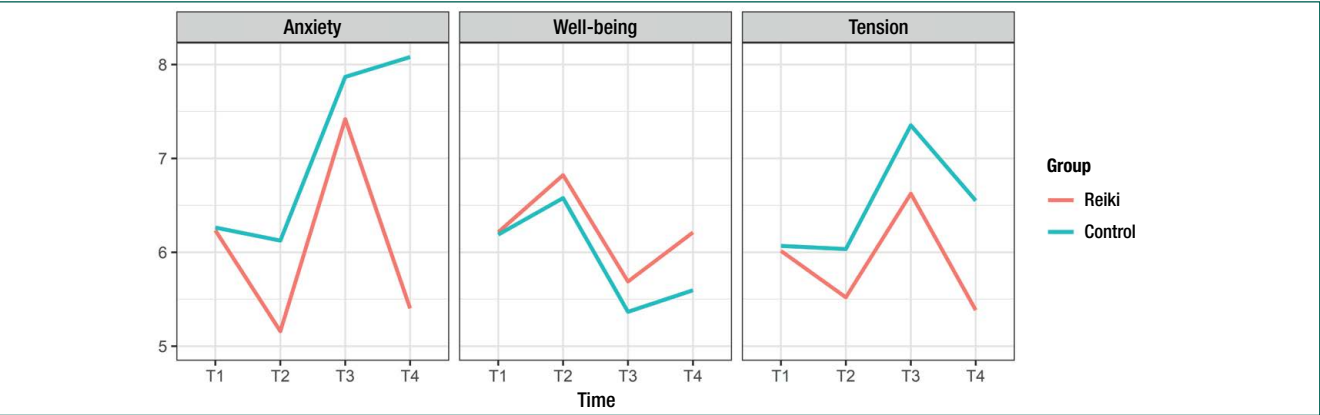


Figure 2. Interaction graph for anxiety, well-being and muscle tension perception between control (n=44) and Reiki (n=44) groups throughout sessions

Table 2. Mixed effects model for anxiety, well-being and muscle tension perception throughout the sessions between control (n=44) and Reiki (n=44) groups

Anxiety	χ^2	df	p	η^2_p	95% CI
Intercept	4683.31	1	<0.001		
Time	1591.18	3	<0.001	0.86	[0.84; 1.00]
Group	28.83	1	<0.001	0.25	[0.13; 1.00]
Time X group	751.94	3	<0.001	0.74	[0.70; 1.00]
Well-being	χ^2	df	p	η^2_p	95% CI ^a
Intercept	3826.55	1	<0.001		
Time	665.23	3	<0.001	0.72	[0.68; 1.00]
Group	2.36	1	0.124	0.03	[0.00; 1.00]
Time X group	40.44	3	<0.001	0.14	[0.07; 1.00]
Muscle tension perception	χ^2	df	p	η^2_p	95% CI
Intercept	3951.35	1	<0.001		
Time	432.65	3	<0.001	0.63	[0.57; 1.00]
Group	9.73	1	0.002	0.10	[0.02; 1.00]
Time X group	79.06	3	<0.001	0.23	[0.16; 1.00]

χ^2 : chi-square; df: degrees of freedom; η^2_p : partial squared eta; 95% CI: 95% confidence interval

Discussion

The research achieved its objective by verifying that the Reiki application protocol was effective in providing better results for anxiety on the eve of heart surgery. Patients' lack of knowledge about Reiki therapy was a limitation of this study. After clarification in the first sessions, patients who agreed to participate without knowing it were somewhat insecure about the intervention, which could even increase the level of anxiety for some of them. However, in the second session this risk of bias was almost non-existent after good acceptance (applicators' and main researcher's perception). A large international study validated the conclusion that it is possible to measure Reiki results with just one session, but this study's choice to include two sessions minimized the possible bias of acceptance of an unknown intervention.⁽²¹⁾ Furthermore, when using the scales, understanding anxiety was almost always easy for participants, while some of them had doubts when assigning scores for well-being and muscle tension perception (which could be a bias in using these two instruments).

For the three dependent variables, initial measurements in the Reiki and control groups did not show a significant difference. After applying the protocol, the control group presented a higher anxiety score, a lower well-being score for the control

group and a higher perceived muscle tension score, all of which were considered significant ($p < 0.001$). The effect size analysis showed that the experiment better identified the variation in anxiety ($\eta^2_p_{\text{anxiety}} = 0.74$) than in the other two variables ($\eta^2_p_{\text{well-being}} = 0.14$; $\eta^2_p_{\text{muscle tension}} = 0.23$). Understanding the anxiety construct was generally immediate for participants, however the other two concepts generated doubts that may have diminished the clinical significance of measurement. Analysis of the control group reveals that there was an increase in anxiety and muscle tension and a decrease in well-being as surgery approached.

Studies using Reiki to reduce preoperative anxiety are few. A retrospective study carried out in a hospital assessed the records of 705 first Reiki application sessions for hospitalized patients in general, finding a significant reduction in anxiety (59.8%; $p < 0.001$) and an increase in well-being (31.6%).⁽²²⁾ In this study, the duration of 75.9% (n=391) of the sessions was 16-30 min. In this research, we adopted a similar protocol.⁽²²⁾ In a pilot study comparing Reiki with Control and Placebo applied to patients in the pre-operative period of knee surgery, a reduction in anxiety scores measured by the Spielberger State-Trait Anxiety Inventory was also evidenced.⁽²³⁾ Such studies are relevant to nursing professionals who work with perioperative nursing in inpatient units.

A quasi-experimental study carried out in Turkey included 201 patients, in the pre-operative period, divided into two groups: one for control and the other to receive a Reiki session. After the session, anxiety was assessed and the results were compared. The authors observed that anxiety state scores before and after did not vary in the intervention group, but increased in the control group.⁽⁹⁾ Although this study reached the calculated sample, its limitation was that it used the Spielberg State-Trait Anxiety Inventory, which considers clinical factors to define anxiety, is long and not always easy to understand. Furthermore, it was not clear how many days before surgery anxiety was measured, whether this period was standardized and whether the study included patients from different specialties, awaiting surgeries of different sizes.⁽⁹⁾

The improvement in well-being perceived by patients was statistically significant in the study with the intervention, although the clinical significance was not high. In another research that aimed to assess the effect of Reiki on the subjective well-being of people who seek this therapy, it was identified that Reiki can enhance the dimensions of positive affect and well-being, contributing to the achievement of satisfactory and pleasurable sensations.⁽²⁴⁾

Conclusion

This study provides robust evidence supporting using Reiki to control preoperative anxiety in cardiac surgery. The results indicate that Reiki is also effective in improving well-being and reducing muscle tension perception, although with less clinical significance. We hope that this study will motivate further research so that Reiki and other ICP can be incorporated into the list of non-pharmacological interventions available to nurses based on reliable evidence.

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Collaborations

Gomes ET and Püschel VA contributed to study design, data analysis and interpretation, article writing, critical review of relevant intellectual content and approval of the final version to be published.

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