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REVIEW

Effects of Massage Therapy on Anxiety in Heart Disease Patients: A Systematic Review

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Abstract

Background: Patients with heart disease often experience anxiety as a response to physiological changes, and massage therapy is one of the alternative treatments available to alleviate this condition. Although the benefits of massage therapy in reducing anxiety are well recognized, there is a lack of focused research evaluating its specific effects on individuals with heart disease.
Purpose: This review aims to systematically assess the effects of massage therapy on anxiety levels in patients with heart disease.
Methods: A systematic review of the literature published between January 1, 2000, and December 31, 2020, was conducted using the PubMed, ScienceDirect, Scopus, CrossRef, and Google Scholar databases. Seventeen studies that met the inclusion criteria were selected for review. The quality of the included studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal tool, and the findings were synthesized narratively.
Results: The review indicates that massage therapy has a positive effect on reducing anxiety in patients with heart disease. Various massage techniques consistently demonstrated significant anxiety-reducing outcomes. However, the heterogeneity of massage therapy techniques limits the ability to draw conclusions about the comparative effectiveness of existing studies, particularly in reducing anxiety levels.
Conclusion: Based on this systematic review, massage therapy appears to significantly reduce anxiety levels in patients with heart disease, including both surgical and non-surgical populations. This review highlights the value of integrating massage therapy into holistic patient care, especially for managing anxiety and enhancing comfort.

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1. Introduction

Heart disease presents a range of pathological conditions that impact the functions of the heart and circulatory system (American Heart Association, 2017). Heart failure is characterized by transformations in both the structure and function of the circulatory system, leading to the heart's declining ability to respond appropriately to various physiological and pathological stimuli (Rahayu, 2020). Individuals diagnosed with heart disease may also experience psychological complications, including anxiety (Chauvet-Gelinier & Bonin, 2017), which is a prevalent comorbidity adversely impacting recovery and quality of life (Jumayanti et al., 2020). Anxiety itself is characterized by feelings of unease or distress that can significantly impact a person's well-being (Jiang, 2022). It can be triggered by numerous factors, including stress of hospitalization, diagnostic procedures, disease prognosis, and insufficient support from their close social network (Kardan et al., 2020). The experience of anxiety triggers the release of sympathetic activity, leading to heightened cardiovascular activity characterized by increased cardiac workload. Consequently, this physiological response may manifest as hypertension, tachycardia, hyperventilation, and acute episodes of panic (Bermudez et al., 2022; Çavdar et al., 2019; Ryan, 2020). Despite these effects, hospital treatment often prioritize physical recovery, with minimal

attention to psychological health. Psychological conditions such as anxiety must be considered during the treatment for the patients (Anisah & Maliya, 2021; Mohaddes et al., 2018).

Non-pharmacological therapy can alleviate the anxiety that heart disease patients experience. Massage is one example of such therapy that can be used for heart disease patients (Liu et al., 2022). Massage therapy is a widely utilized alternative treatment modality within the field of nursing (Kim et al., 2016); touching with one's bare hands is used to alleviate discomfort from a variety of injuries and to reduce stress (Boitor et al., 2018). Massage therapy is a valuable component of a comprehensive nursing intervention aimed at mitigating stress, as it impacts both mental and physical well-being and alleviates anxiety (Aini & Maliya, 2020). This occurs because contact also stimulates the release of endorphin hormones in the body. Elevated endorphin levels can affect mood and reduce patient anxiety (Pratiwi & Irdawati, 2019).

Recent studies have provided evidence indicating that massage therapy has the potential to alleviate anxiety symptoms among those diagnosed with heart failure (Alameri et al., 2020). Persistently, other studies have shown that the average anxiety score of individuals in the intervention group were initially high, but significantly decreased after the intervention of massage therapy (Mohaddes et al., 2018). Furthermore, studies have shown that massage therapy reduces anxiety through mechanisms such as easing muscle tension, improving blood flow, lowering the activity of the sympathetic nervous system, reducing the stress hormones production, and increasing serotonin levels (Hsu et al., 2019; Jagan et al., 2019). Nurses may perform massage therapy as a nursing intervention to help patients become more independent in dealing with anxiety-related problems (Bahrami et al., 2020). Moreover, this therapy is cost-effective and can be considered a complementary treatment option. Despite growing recognition of the psychological burden among heart disease patients, anxiety remains one of the most prevalent yet often under-addressed comorbidities, significantly affecting treatment adherence and quality of life (Stenman et al., 2022). Recent studies have explored massage therapy as a complementary intervention to alleviate anxiety in this population (Miozzo et al., 2016).

A previous study conducted by Farquhar et al. (2018) includes various interventions that can reduce anxiety in coronary heart disease patients, while the survey conducted is more specific to massage therapy and its positive results in reducing cardiac patients' anxiety. Nonetheless, concerning postoperative either heart disease or other diseases, the study has left a gap in understanding the massage therapy effects on anxiety in non-surgical heart disease patients. Additionally, variations in massage techniques, session durations, and measurement tools across studies limit the generalizability of findings. Therefore, there is a critical need for well-designed clinical trials to evaluate how efficient standardized massage therapy protocols are in easing anxiety among the broader heart disease patient population. The present review was conducted to systematically assess the effects of massage therapy on anxiety levels in patients with heart disease.

2. Methods

2.1. Research design

This study followed the PRISMA 2020 Statement criteria employed for the systematic review and article selection process (Page et al., 2021). The protocol for the investigation has been registered on PROSPERO with the registration number CRD42021243429.

2.2. Search methods

Several databases were used, for instance, PubMed, ScienceDirect, Scopus, CrossRef, and Google Scholar for scientific articles published from January 1, 2000, to December 31, 2020. In this study, tools in the form of the application Publish or Perish were used to seek relevant scientific articles.

Several keywords were modified to align with the topic and title of the research conducted by the authors (BK & BV), using the conventional Boolean Operators "AND" and "OR" - along with their corresponding terms from the Medical Subject Heading (MeSH) vocabulary. The search terms employed encompassed the phrases "cardiovascular disease OR heart disease" AND "anxiety" AND "massage OR massage therapy". The search terms were input into the electronic database search field and subsequently refined based on the provided criteria.

2.3. Inclusion and exclusion criteria

Based on the PICO framework, the population was heart failure patients, while the intervention studied was massage therapy. The comparison was made between the population that received massage therapy and those that did not. The expected outcome was a reduction in anxiety levels measured by a standardized anxiety scale. Thus, the aim of this study was to assess whether massage was effective in reducing anxiety in patients with heart disease compared to standard care. Researchers established the following inclusion criteria: articles published from January 1, 2000, to December 31, 2020; subjects with heart disease and anxiety who received massage therapy intervention; scientific articles with full-text availability; international and national scientific articles; and scientific articles designed as Randomized Controlled Trials. The exclusion criteria was articles not in English.

2.4. Screening of articles

The initial phase involved identification, during which the researchers compiled the overall quantity of the articles retrieved from all database queries. The subsequent phase entailed a process of screening, wherein the researchers employed a criteria-based approach to determine the inclusion or exclusion of papers, primarily relying on examining titles and abstracts. The third stage, eligibility, involved the authors' selecting articles containing the complete content. The articles that matched the criteria were included in the study, while those that did not meet the requirements were excluded. The quality of articles was assessed using the JBI critical appraisal tool, depending on the study design. For instance, randomized controlled trials were appraised using the checklist for randomized controlled trials (Barker et al., 2023). Furthermore, an assessment was conducted to measure the quality of the selected full-text papers. During the fourth step, a thorough examination of documents relevant to the study's topic and title was conducted (Page et al., 2021).

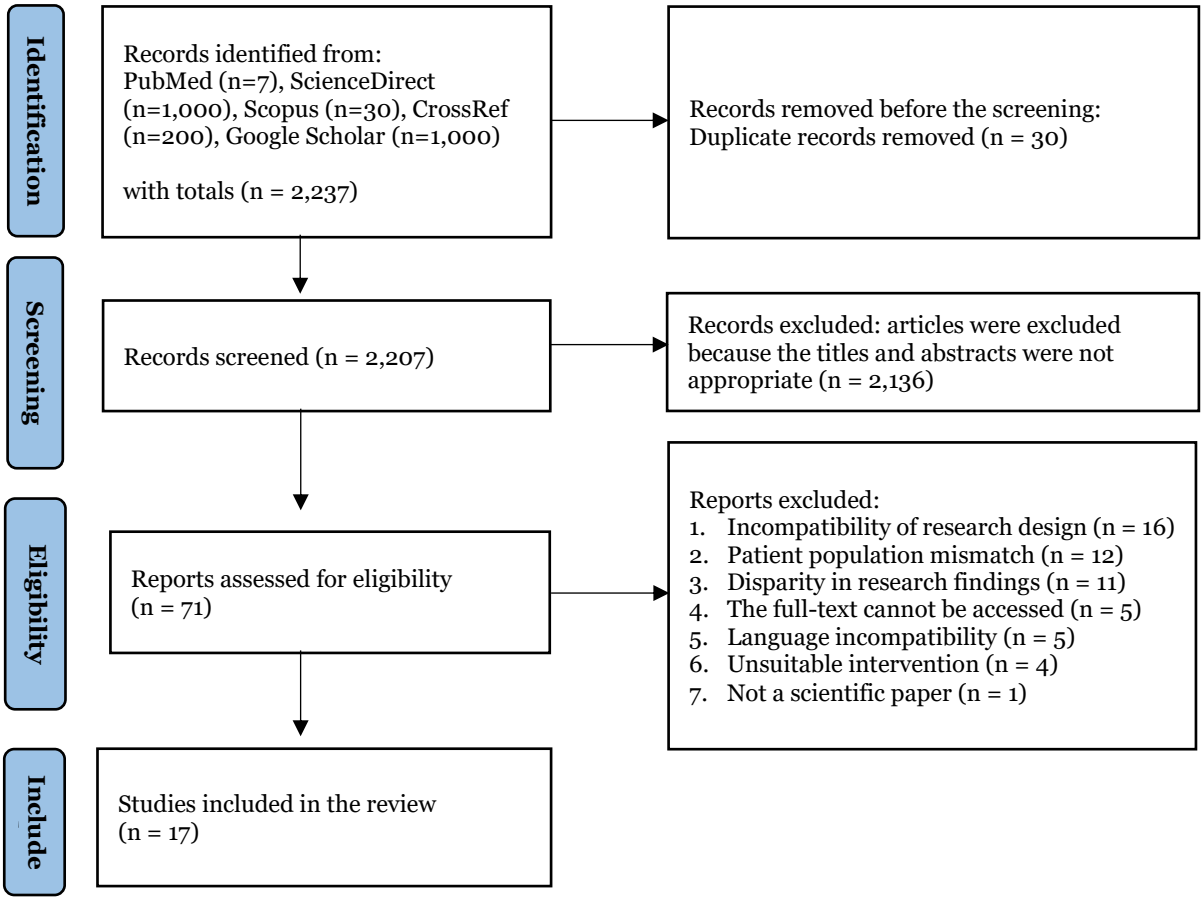

Figure 1. PRISMA flow diagram

The two researchers (BK & BV) reviewed the article titles and abstracts independently. Then, they filtered the entire content of the selected articles. If there was a disagreement at any point, the two researchers would discuss it, and if the disagreement could not be settled, the third researcher (AR) would be considered an arbitrator.

The PRISMA guideline provides a wide-ranging framework for ensuring transparency and rigor in the synthesis of research findings, making it an essential tool for accurately assessing massage therapy's effects on heart disease patients' anxiety (Figure 1).

2.5. Data extraction

The systematic review involved the examination of relevant literature titles in order to undertake the abstract and full-text analysis phases. This process was performed in line with the criteria. Each researcher individually performed this procedure (BK & BV). The subsequent phase involved examining the abstract portion of the literature or journal, with specific attention to the research problem, research methods, objectives, and outcomes. This analysis aims to ascertain whether the subject under discussion aligns with the focal point of the publication. After analyzing the journal's abstract, the researcher focused on the literature's keywords. If the analysis of the title, abstract, and keywords was pertinent to the topic, the full-text analysis was done.

2.6. Quality appraisal

The study quality was measured separately by the two researchers (NM & NW). Additionally, possible disagreements were settled through discussion and/or views of the third researcher (AR). JBI critical appraisal tools were the tools used in this systematic review study (Barker et al., 2023). The research design that was critically reviewed was a Randomized Controlled Trial (RCT). There were no articles reviewed with a maximum score of 13; the majority of articles had a score of 10 out of 13 (Table 1).

2.7. Data analysis

Data analysis was conducted using Covidence systematic review management, a web-based software platform designed to streamline systematic reviews. Covidence facilitated collaborative screening, selection, and data extraction of eligible studies that explored the massage therapy effect on heart disease patients' anxiety. Due to the expected heterogeneity in massage therapy protocols and anxiety outcome measures, a narrative synthesis approach was adopted.

3. Results

3.1. Search results

The article search generated 2,237 articles during the identification phase (PubMed: 7, ScienceDirect: 1,000, Scopus: 30, CrossRef: 200, Google Scholar: 1,000). Due to duplication, 30 articles were eliminated. Furthermore, 2,207 papers underwent screening at the initial stage, with selection criteria based on the title and abstract of each article. Following selection, approximately 2,136 articles were excluded for failing to meet the criteria. At the eligibility stage, 71 articles were selected, and 16 were excluded because of the incompatibility of research design, patient population mismatch, disparity in research findings, or the full-text versions could not be accessed. Moreover, other reasons included language incompatibility, unsuitable intervention, and/or non-scientific paper. Finally, 17 articles were included for review.

3.2. Respondents' characteristics

The total sample size obtained from 17 articles was 1,464 individuals. The characteristics of the study respondents included patients undergoing diagnostic procedures such as angiography and cardiac surgery patients, as well as patients with internal heart disease such as acute coronary syndrome (ACS), coronary artery disease (CAD), and post-percutaneous coronary intervention (PCI). These variations represent the clinical spectrum of cardiovascular patients. Furthermore, most of the respondents were identified as having coronary syndrome.

3.3. Intervention characteristics

Types of massage interventions were used to alleviate anxiety in patients with cardiac disease. There were various forms of massage, including body, hand, foot, back, full-body, reflexology, aromatherapy, and Chinese massage (Mei et al., 2017). In a variety of studies, different types of

massage were examined. Hand, foot, and body reflexology massage types were described in some studies (Adib-Hajbaghery et al., 2014b; Bahrami et al., 2017). Body massage was performed in one study (Adib-Hajbaghery et al., 2014b; Cutshall et al., 2010), while hand and foot massages were conducted in others (Alameri et al., 2020; Albert et al., 2009). Additionally, some studies explored massage therapy combined with aromatherapy (Bahrami et al., 2017; Bahrami et al., 2020), and others examined massage therapy combined with acupressure on the hands (Rahmani Vasokolaei et al., 2019). Massage therapy typically lasted between five and sixty minutes. There was one study that did not mention the duration of massage therapy (Peng et al., 2015).

Table 1. Methodological critical appraisal checklist

Paper & Country	Question Number													Total Score
	1	2	3	4	5	6	7	8	9	10	11	12	13	
(Abbaszadeh et al., 2018); Iran	Yes	Yes	Yes	Un clear	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	11
(Adib-Hajbaghery et al., 2014b); Iran	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Alameri et al., 2020); Saudi Arabia	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	11
(Albert et al., 2009); USA	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Seyyed et al., 2018); Iran	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
(Bahrami et al., 2017); Iran	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Bahrami et al., 2020); Iran	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Boitor et al., 2018); Canada	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Cutshall et al., 2010); USA	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
(Heidari et al., 2017); Iran	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Khaledifar et al., 2017); Iran	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	8
(Mei et al., 2017); China	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	11
(Mobini-Bidgoli et al., 2017a); Iran	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Peng et al., 2015); China	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
(Rahmani et al., 2018); Iran	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Molavi Vardanjani et al., 2013); Iran	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
(Rahmani Vasokolaei et al., 2019); Iran	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	12

Notes. Yes = 1, No = 0, Unclear = 0

3.4. Key findings

Seventeen articles showed that massage therapy could significantly reduce anxiety levels. Moreover, additional analysis revealed that massage therapy was also valuable in reducing pain, blood pressure, respiration frequency, and heart rate in cardiac patients. These findings confirm that massage therapy not only contributes to the improvement of patients' mental health but also provides important physical benefits, thus making it a beneficial intervention in the care of cardiac patients.

3.5. Measurement result

Seventeen scientific articles investigating the effect of massage on anxiety levels among individuals diagnosed with heart disease were comprehensively analyzed. Alongside the findings on the benefits of massage reducing anxiety, there were other benefits such as reducing pain, blood pressure, respiration frequency, heart rate. The results are briefly shown in Table 2.

4. Discussion

This systematic review provides a thorough assessment of the existing evidence about how massage treatment affects levels of anxiety in individuals diagnosed with heart disease. Evidence from various studies suggests that massage therapy may serve as a viable intervention to reduce anxiety among individuals suffering from heart disease, such as diagnostic procedures, surgical procedures, and internal heart conditions. Most studies in this review have reported significant reductions in anxiety levels following the application of massage therapy.

The results of this study support previous studies that indicate massage therapy can reduce anxiety in patients (Harris & Richards, 2010; Navaee et al., 2020). Furthermore, massage activities reduce not only anxiety but also melancholy, blood pressure, and glucose levels (Lee & Yeun, 2017). Massage therapy can stimulate the central nervous system, lower heart rate and respiration rate, and induce a sense of calm (Siva Kumar et al., 2023). However, this study contradicts previous research showing that there was no significant difference in the anxiety levels between the message group and the control group (Peng et al., 2015).

Massage therapy has been increasingly recognized as a complementary intervention for reducing anxiety among patients with heart disease. Anxiety is a common psychological comorbidity in this population, often contributing to poorer clinical outcomes, increased sympathetic activity, and decreased adherence to treatment regimens (Celano et al., 2018). Therefore, integrating massage therapy into standard cardiac care may serve as a supportive approach to improving mental well-being. Massage therapy may alleviate anxiety by activating pressure receptors beneath the skin, resulting in decreased sympathetic activity and enhanced vagal tone—mechanisms that are especially pertinent to cardiovascular health (Field, 2019). Psychologically, the human touch inherent in massage may foster emotional support and a sense of security, helping to alleviate psychological distress. A randomized controlled trial conducted by (Mobini-Bidgoli et al., 2017a) demonstrated that hand and foot massage significantly decreased anxiety levels in patients with acute coronary syndrome. Moreover, the tactile stimulation by massage fosters a sense of safety and comfort, thereby contributing to psychological relaxation.

Reflexology, as a type of massage, also showed effectiveness in reducing anxiety levels in heart disease patients as an impact of physiological changes. Consistent with the previous study, reflexology has been found to have the potential to reduce activity in the sympathetic nervous system, induce profound relaxation, relieve tension, and restore body homeostasis (Ozturk et al., 2018). Previous studies indicated the period of four weeks of 30 – 40 minutes of foot reflexology (Sajadi et al., 2020) and 45 minutes, conducted biweekly over five weeks were effective (Dikmen & Terzioglu, 2019). Moreover, massage therapy has been found to obstruct the transmission of nerve impulses from the peripheral nerves to the spinal cord, a phenomenon called gate closure stimulation (Alameri et al., 2020; Taheri et al., 2019). Additionally, massage therapy has been observed to promote the release of relaxation hormones, such as beta-endorphins, serotonin, and dopamine, while simultaneously reducing cortisol secretion (Kanakalakshmi, 2022).

Another type of massage, foot reflexology, also showed effective in reducing anxiety levels in heart disease patients. Foot reflexology can improve circulation, which is particularly beneficial for patients, as poor circulation can exacerbate symptoms such as fatigue and shortness of breath. Applying pressure to reflex points corresponding to the heart and circulatory system can stimulate blood flow and aid in the oxygenation of tissues (Kotruchin et al., 2021). Enhanced circulation can reduce the strain on the heart, potentially lowering blood pressure and helping to regulate heart rate (Jing et al., 2022). Additionally, it significantly improved the functional capacity of individuals with coronary heart disease (Khairullah & Norlinta, 2023). Massage therapy, particularly aromatherapy massage and foot reflexology, has been shown to influence the autonomic nervous system, promoting relaxation and reducing stress indicators such as heart rate and cortisol levels (Miozzo et al., 2016). These physiological changes are particularly beneficial for heart disease patients, as managing anxiety improves emotional well-being and potentially reduces the risk of exacerbating cardiovascular symptoms (Cutshall et al., 2010).

Table 2. Summary of data items

No	Author, Year	Design	Massage Type	Duration	Frequency	Study Setting	Research Findings
1	(Boitor et al, 2018)	RCT	Hand massage and holding hands	20 minutes	3x daily for 2 days	Postoperative cardiac surgery	The study results indicate a statistically significant decreased anxiety (p=0.015), decreased pain intensity (p=0.034), and decreased discomfort (p=0.009).
2	(Heidari et al., 2017)	RCT	Hand reflexology massage	20 minutes, 10 minutes each hand	1x a day for 1 day	Waiting for coronary angiography	The study results indicate a statistically significant decreased anxiety level (p=0.0001)
3	(Mobini-Bidgoli et al., 2017a)	Single blinded RCT	Hand reflexology massage	10 minutes	8-10x daily for 1 day	One hour before undergoing the procedure coronary angiography	The study results indicate a statistically significant decreased anxiety level (p=0.0001)
4	(Rahmani et al., 2018)	RCT	Hand reflexology massage	20 minutes, 10 minutes per hand	1x a day every 1 day	ACS patient in the Cardiac Care Unit (CCU)	No differences were observed between the intervention and placebo groups prior to the intervention (p>0.05). After the intervention and 30 minutes post-intervention, the anxiety level in the intervention group was significantly lower compared to the placebo group (p<0.05, η = 0.090). Nonetheless, there were no differences in physiological variables between the groups (p>0.05).
5	(Rahmani Vasokolaei et al., 2019)	Double-blinded RCT	Hand reflexology massag and hand accrual	20 minutes, 10 minutes per hand	1x a day every 1 day	Coronary Artery Disease (CAD) patient in CCU	Decreased anxiety (p=0.001), no significant decrease in heart rate frequency (p=0.03 to 0.09), breathing frequency (p=0.33 to 0.50), and arterial pressure (p=0.54 to 0.70)
6	(Seyyed et al., 2018)	Single Blinded RCT	Hand and foot massage	20 minutes, each part 5 minutes	1x daily for 1 day	Patients with Acute Coronary Syndrome (ACS)	Decreased anxiety (p=0.000), systolic blood pressure (p=0.000), diastolic (p=0.000), respiratory frequency (p=0.000), and heart rate frequency (p=0.000)

Table 2. Continued

No	Author, Years	Design	Massage Type	Duration	Frequency	Study Setting	Research Findings
7	(Mei et al., 2017)	Single blinded RCT	Chinese hand massage	15 minutes	1x daily for 3 days	Awaiting coronary angiography	Decreased anxiety level (p<0.001), no significant change in the level of systolic blood pressure (p=0.968), diastolic blood pressure level (p=0.857), heart rate frequency (p=0.774 and quality of life (p=0.505).
8	(Hajbaghery et al., 2014)	RCT	Full body massage	60 minutes	1x a day for 1 day	Male patients hospitalized in CCU with ACS or AMI	Decreased anxiety (p=0.001), systolic blood pressure (p=0.25), diastolic blood pressure (p<0.05), heart rate frequency (p<0.05), and respiratory frequency (p<0.05).
9	(Cutshall et al., 2010)	RCT	Full body massage according to the patient's condition	20 minutes	1x daily for 2 days	Scheduled for cardiac surgery that required cardiopulmonary bypass	Decreased anxiety (p<0.001), pain (p<0.001), tension (p<0.001), and increased satisfaction (p=0.08)
10	(Peng et al., 2015)	RCT	Body massage	Not mentioned	Not mentioned	Surgical patients who were ready to receive Percutaneous Coronary Intervention (PCI)	Decrease in anxiety level is not significant (p=0.332), decrease in systolic blood pressure level (p<0.05), decrease in diastolic blood pressure level (p<0.05), decrease in heart rate frequency (p<0.05), decrease in pain level (p=0.009)
11	(Khaledifar et al., 2017)	RCT	Reflexotherapy and body massage	30 minutes of reflex therapy and 20 minutes of body massage	1x daily for 1 day	Before angiography	Decreased anxiety level (p<0.001), decreased systolic blood pressure level (p<0.001), decreased diastolic blood pressure level (p=0.096), decreased body temperature was not significant (p=0.016), decreased respiratory frequency (p<0.001), decreased heart rate frequency (p<0.001)

Table 2. Continued

No	Author, Years	Design	Massage Type	Duration	Frequency	Study Setting	Research Findings
12	(Mei et al., 2017)	RCT	Back massage, hands, and feet massage	30 minutes, 10 minutes of each section	2x daily for ≤7 days	Scheduled for open-heart surgery	Preoperative pain, anxiety, mood, and affective state scores were correlated with postoperative scores. Nonetheless, no significant postoperative differences between groups were found for any measures (p=0.11 to 0.93). The only physiological difference was a lower postoperative blood pressure in the massage group (p=0.01). The occurrence of postoperative atrial fibrillation (P = .6) and median postoperative hospital length of stay (p=0.4) were similar between the groups.
13	(Alameri et al., 2020)	Single Blinded RCT	Foot massage	10 minutes, 5 minutes per foot	2x daily for 1 day	Patients admitted to the surgical intensive care unit after undergoing elective cardiac surgery.	Decreased pain level (p<0.001) and anxiety level (p<0.001)
14	(Molavi Vardanjani et al., 2013)	Single-blinded RCT	Foot reflexology	30 minutes, 15 minutes per foot	3 times a day for 3 days	The patients were scheduled for their first elective coronary angiography.	Decreased anxiety (p=0.026), systolic blood pressure (p=0.006), diastolic blood pressure (p=0.001), respiratory frequency (p=0.001), heart rate frequency (p=0.074), arterial pressure level (p=0.001), and increased oxygen saturation (p=0.002)
15	(Abbaszadeh et al., 2018)	Single Blinded RCT	Foot reflexology	30 minutes, 15 minutes per foot	3x daily for 3 days	Male patients diagnosed with CAD and scheduled for non-urgent Coronary artery bypass graft (CABG)	Decreased anxiety (p=0.026), systolic blood pressure (p=0.006), diastolic blood pressure (p=0.001), respiratory frequency (p=0.001), heart rate frequency (p=0.074), arterial pressure level (p=0.001), and increased oxygen saturation (p=0.002)

Table 2. Continued

No	Author, Years	Design	Massage Type	Duration	Frequency	Study Setting	Research Findings
16	(Bahrami et al., 2017)	RCT	Aromatherapy massage	+5 minutes with details: 14 seconds in the solar plexus, 40 seconds in the pituitary gland, 5 seconds in the head, 10 seconds in the chest area (heart), 5 seconds in each part of the stomach (intestine), 5 seconds in the gland and kidney area	1x a day for 1 day	Patients with ACS in the CCU	Significant differences in depression and anxiety levels were found in both groups following the intervention. Physiological parameter analysis showed a statistically significant reduction in systolic and diastolic blood pressure, mean arterial pressure, and heart rate ($p<0.05$). Nevertheless, respiratory rate did not significantly differ between the groups.
17	(Bahrami et al., 2020)	RCT	Reflexology and aromatherapy massage	10 minutes total reflexology massage, 20 minutes each leg on aromatherapy massage	1x a day for 1 day	Female patients with CAD in CCU	Decreased anxiety ($p=0.001$), decreased level of depression ($p=0.001$)

The results of previous studies indicated that a significant decrease in respiratory frequency did not occur due to the differences in techniques used, duration of intervention, and the possibility of simultaneous psychological and physiological stress influencing the measurement results (Albert et al., 2009; Mei et al., 2017; Rahmani et al., 2017b; Vasokolaei et al., 2019). In accordance with the previous study (Ghanbari et al., 2022), respiratory frequency and arterial oxygen saturation did not significantly differ between the two groups before the intervention. However, following the interaction, there was a substantial disparity in the average values of these variables between the two groups.

In contrast to these positive results, some studies reveal no statistically significant difference between control groups and massage therapy recipients. These inconsistencies may be attributable to disparities in methodology, such as small sample sizes or the absence of blinding. It may also reflect the complexity of treating psychological symptoms in a medical context, where multiple variables can influence the outcomes. Nevertheless, it is essential to acknowledge that discrepancies may have influenced the observed outcomes in the frequency, length, and types of massage employed across different studies. It is important to note that none of the included studies reported massage therapy-related adverse events. This finding supports prior studies indicating that therapeutic touch is generally safe, even for those with severe health conditions such as heart disease, when performed by trained professionals (Ramezanibadr et al., 2018).

5. Implication and limitation

In general, massage therapy provides a sense of comfort and enhances physical and mental well-being by promoting relaxation. It serves as a non-pharmacological intervention utilized as a additional and alternative therapy. Additionally, massage therapy is a cost-effective approach that typically does not produce significant side effects or interactions with medications. For nursing practice, this review highlights the value of integrating massage therapy into holistic patient care, especially for managing anxiety and enhancing comfort. Nurses can play a key role in identifying patients who may benefit, educating them about the therapy, and coordinating its use within multidisciplinary care plans.

This systematic review has some limitations. First, only English-language publications were included, which would have resulted in language bias and omission of pertinent research written in other languages. Second, it was challenging to do a meta-analysis due to the variations in massage therapy methods, frequency, and length among research, which also hampered the comparability of findings. Furthermore, because clinical practices vary over time, the inclusion of research from a broad time span (2000–2020) may increase variability. Despite these limitations, this review offers substantial proof in favor of massage therapy's usage as a non-pharmacological strategy to lower anxiety in heart disease patients, underscoring its potential contribution to comprehensive nursing care.

6. Conclusion

Researchers have found that massage therapy reduces anxiety levels in individuals diagnosed with heart disease. The articles reviewed demonstrate that different massage therapy techniques consistently result in a reduction of anxiety levels. This phenomenon can be attributed to the stimulation of the central nervous system through massage therapy, which subsequently induces relaxation. Consequently, this therapeutic intervention exerts an influence on psychological stress, specifically in the manifestation of anxiety.

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Author contribution

The authors, BK and BV, are engaged in developing a study design, conducting a comprehensive literature search, and composing scholarly articles. The authors, NM and NW, are responsible for evaluating the quality of the studies, doing the literature search, and providing significant intellectual input during the development and revision of the text. An arbitrator (AR) is the one who is appointed to resolve disputes between parties fairly and impartially.

Conflict of interest

The findings of this systematic review do not exhibit any conflicts of interest.

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