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Anxiety reduction in patients undergoing cardiac catheterization following massage and guided imagery

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A B S T R A C T

Objective: This study aimed to evaluate the effectiveness of massage with or without guided imagery in reducing anxiety prior to cardiac catheterization.
Method: A total of 55 inpatients and outpatients received massage, guided imagery, or massage with guided imagery prior to cardiac catheterization. Self-reported anxiety levels and blood pressure (BP) and heart rate (HR) were evaluated in participants and a matched comparison group.
Results: Massage with and without guided imagery resulted in significant reductions in self-reported anxiety ($p < 0.0001$). Patients receiving intervention had lower diastolic BP and HR vs. the comparison group ($p < 0.0001$ and $p < 0.05$).
Conclusions: Massage with or without guided imagery immediately reduced self-reported anxiety. This pilot study has certain limitations: a non-randomized, convenience sample and a matched control group that was created retrospectively. However, the study indicates a benefit to providing massage or massage with guided imagery prior to anxiety-inducing medical procedures such as cardiac catheterization.

1. Introduction

For patients undergoing cardiac catheterization, the anticipation of the invasive procedure can be filled with anxiety and fear of the procedure itself and/or the results [1–5]. This anxiety may interfere with the start or completion of the cardiac catheterization procedure, as it can have profound effects on the patient's blood pressure and the amount of sedation required prior to and during the procedure [3]. In turn, these physiologic effects could result in complications or the procedure being prolonged or even cancelled [1].

The National Center for Complementary and Alternative Medicine reports that approximately 38% of adults in the USA use alternative treatments [6]. The utilization of alternative medicine treatments, massage in particular, has increased significantly since 2002 and is greater among women than men. In addition, the report identifies anxiety as one of the top five conditions for which alternative medicine is most frequently used.

Reducing anxiety prior to a cardiac catheterization procedure is a topic of interest, and some studies have shown that increased patient education can reduce patient anxiety [7,8]. However, while the benefits of massage have been documented in many non-clinical areas [9–11], few studies have evaluated the benefits of massage and guided imagery prior to cardiac interventions in reducing anxiety [12,13]. Studies conducted in catheterization laboratories have been limited to massage treatment **alone or therapeutic touch** and have provided conflicting results [14–18]. Specifically, one study showed that a 10-min massage prior to a cardiac catheterization procedure did not result in a significant reduction of anxiety or blood pressure [14], whereas another study showed that a 20-min massage prior to cardiac catheterization resulted in a significant reduction in systolic blood pressure and distress [15].

Guided imagery involves progressive mental exercises designed with the goal of enabling the mind to influence the health and well-being of the body. In controlled studies, the technique has been shown to reduce stress, anxiety, and depression, manage pain,

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lower blood pressure, and create feelings of being in control in several subsets of patients, including patients with chronic pain, cancer, surgical recovery, phobias, depression, anxiety, and addictions [19–21]. The use of guided imagery for cardiac surgery patients has demonstrated success in decreasing anxiety and reducing length of stay [2,3,22]. While pharmaceutical agents are typically used perioperatively in cardiac catheterization patients, guided imagery can produce similar outcomes [23].

The literature currently lacks studies that address the effects of massage and guided imagery or the feasibility of integrating such services in a busy cardiac catheterization laboratory. This study attempts to address these gaps in the literature. The primary purpose of this pilot study was to assess the immediate effects of massage, guided imagery, and massage with guided imagery on self-reported anxiety prior to catheterization procedures. It was hypothesized that patients receiving these interventions would show an immediate reduction in anxiety. Secondary outcomes of interest involved physiologic measures in the catheterization laboratory in patients who did or did not receive an intervention; the patients receiving massage, guided imagery, or massage with guided imagery were expected to exhibit lower blood pressure and heart rate compared with patients who did not receive the intervention(s). In addition, the study provides observational evidence regarding the feasibility of incorporating massage therapy and guided imagery in the pre-operative waiting period in a cardiac catheterization laboratory.

2. Methods

2.1. Sample

The participants consisted of a convenience sample of inpatients and outpatients scheduled for cardiac catheterization at a single, large (1061 beds), tertiary care, teaching hospital on 24 specified days between January 26, 2010, and April 9, 2010. The targeted days were dependent on patient scheduling, with the busiest days chosen for the study. To improve the patient experience and help reduce anxiety, the catheterization laboratory engaged the Integrative Medicine department to provide massage, guided imagery, and massage with guided imagery to patients prior to their scheduled cardiac catheterization procedure. On each of the study days, one of four massage therapists was provided a list of patients scheduled for catheterization procedures on that day. Outpatients were approached in the Heart Center waiting room; inpatients were approached in their hospital room. The approached patients were offered a complimentary 15-min massage, a 20-min guided imagery session, or both massage and guided imagery. However, not all patients were approached; some were called for the procedure before the massage therapist invited them to participate. The patients selected the intervention(s) received: massage; guided imagery; or massage with guided imagery. The intervention for inpatients was performed in the patient's room; for outpatients, the intervention was performed in a quiet library conference room off the main waiting room in the Heart Center. **The participants were separated from the main waiting area to minimize noise and disruptions and promote relaxation.** Patients receiving the intervention were asked if they would be willing to also participate in a research component of the program, which would assess the effectiveness of the program. The catheterization laboratory physicians wanted all patients on the designated days to have the opportunity to receive the interventions, not just those agreeing to participate in the research study. Therefore, the interventions were offered to patients regardless of whether they consented to participate in the research study. Verbal informed consent was provided by each patient agreeing to participate in the research component. This study was approved by the participating hospital's Institutional Review Board.

To examine the effect of the interventions on physiologic measures, a matched comparison group was selected retrospectively from a list of patients who received a cardiac catheterization during the same time frame as the treatment group but were not offered massage or guided imagery services. The comparison group was matched with the treatment group with regard to age, gender, procedure (right, left, or right and left heart catheterization), and inpatient/outpatient status.

2.2. Study design

The study was a two-part study involving questionnaire data and chart review data. The first part of the study was a prospective survey study assessing the immediate effect of massage, guided imagery, or massage with guided imagery on self-reported anxiety. The second part of the study was a retrospective chart review study that compared physiologic measures in the catheterization laboratory, prior to the catheterization procedure, between the intervention group and a matched comparison group.

3. Massage, guided imagery, and massage with guided imagery interventions

All interventions were administered in a quiet room apart from the main waiting area to minimize discomfort and noise The massage treatments were performed by four massage therapists with a minimum of 600 h of massage training each. Each massage session followed the same protocol and lasted 15-min, unless the patient was called for the catheterization procedure prior to completion, in which case, the massage treatment was shortened to allow the patient to proceed to the catheterization laboratory. Massage treatment for outpatients was performed on a massage chair, or an office side chair if the patient was not comfortable on a massage chair. Swedish techniques (effleurage, petrissage, and compressions) were used on the entire back, scalp, and arms. Inpatients received Swedish techniques to the hands or feet, based on patient preference, while remaining in their own hospital bed. Patients opting for the guided imagery treatment were provided with a headset and a 20-min general relaxation CD to listen to until they were called for the cardiac catheterization procedure. The patients receiving both massage and guided imagery listened to the CD prior to and after the massage, according to the best fit for scheduling purposes, until the cardiac catheterization procedure. The guided imagery recording used in the study consisted of a woman's voice with soft music playing in the background. The recording presented a three-step process. The first step was a progressive relaxation exercise followed by the second step in which relaxing suggestions were given, guiding the patient to a beautiful calming beach setting. The third step was the ending, which gently brought the patient back to their current surroundings. **The patients were provided some quiet and privacy to minimize interruptions**; however, the interventions were halted when the patient was called for the cardiac catheterization procedure to ensure that there would be no disruption to patient flow.

4. Measures

Patients accepting the invitation for complimentary massage, guided imagery, or massage with guided imagery services were asked to participate in a simple research study, which included a four-item research survey. A 10-point analog scale was use to assess pre- and post-intervention anxiety levels. **This simple** survey was easy for the patients to complete rapidly, thus preventing any