

Knee arthritis pain is reduced and range of motion is increased following moderate pressure massage therapy



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ABSTRACT

Background: The literature on massage therapy effects on knee pain suggests that pain was reduced based on self-report, but little is known about range of motion (ROM) effects.

Methods: Medical School staff and faculty who had knee arthritis pain were randomly assigned to a moderate pressure massage therapy or a waitlist control group (24 per group). Self-reports included the WOMAC (pain, stiffness and function) and the Pittsburgh Sleep Quality Index. ROM and ROM-related pain were assessed before and after the last sessions.

Results: The massage group showed an immediate post-massage increase in ROM and a decrease in ROM-associated pain. On the last versus the first day of the study, the massage group showed greater increases in ROM and decreases in ROM-related pain as well as less self-reported pain and sleep disturbances than the waitlist control group.

Discussion: These data highlight the effectiveness of moderate pressure massage therapy for increasing ROM and lessening ROM-related pain and long-term pain and sleep disturbances.

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Knee arthritis pain is decreased and range of motion is increased following massage therapy.

The Center for Disease Control (2014) has claimed that by the year 2020 6.5 million Americans between the ages of 35 and 84 are expected to be diagnosed with knee arthritis. The literature on massage therapy effects on knee pain is limited but consistent on its reports of reduced self-reported pain, typically on Vitas pain scales and on the Western Ontario and McMaster Universities Arthritis Index (WOMAC) [1–4]. However, on more objective measures such as range of motion (ROM), these four studies are inconclusive. This would relate to ROM not being measured in two of the studies [1,2]. In the first of these, pain was measured using a 10-point Likert scale, and pain decreased even though only the patient's healthy foot, hands and upper parts of the shoulders were massaged “shallowly” for 20 min each day of their hospitalization [1].

In the other two studies, ROM was measured but was not changed [3,4]. In one of these studies a self-massage protocol was used [3], making it difficult to ensure that sufficient pressure was being applied. In the other study, although a reduction in pain and

stiffness and an increase in function were noted on the self-report WOMAC scale, the ROM results were negative [4]. This could relate to the use of low pressure Swedish massage that also was not focused on the affected leg [4]. In this study, although the massage was an hour duration, only 50% of the massage was applied to the affected leg, and the Swedish massage protocol may have lacked sufficient pressure to have affected ROM.

A study comparing Thai massage with Swedish massage in a sample of older people with knee osteoarthritis supports the need for moderate pressure [2]. In this study the group that received Thai massage (which generally involves more pressure) reported a greater reduction in pain on the WOMAC than the group that received Swedish massage.

In the present study, moderate pressure massage by massage therapists was applied to the affected leg, focusing on the quadriceps and the hamstring muscles. Moderate pressure was used since it has been noted to be more effective than light pressure massage in many of our previous studies on healthy adults [5] and adults with hand pain [6], upper arm and shoulder pain [7] and neck arthritis pain [8]. For example, in the study on individuals with rheumatoid arthritis in their upper limbs, half the sample received moderate pressure massage (moving the skin) and the other received light pressure massage [7]. A therapist massaged the

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affected arm and shoulder once a week for four weeks. The moderate pressure massage group versus the light pressure massage group had less pain and greater grip strength following the first and last sessions. By the end of the four week period the moderate pressure group also had less pain, greater grip strength and greater range of motion (greater wrist and elbow flexion and greater shoulder abduction). Further, the massage in the present study was focused on the quadriceps muscle inasmuch as researchers have reported a relationship between quadriceps weakness, increased pain and altered walking patterns [9]. The hamstrings were also massaged as the previous studies [3,4] failed to find ROM increases when focusing on the quadriceps.

1. Method

1.1. Participants

Based on our hand and upper limb arthritis studies, a power analysis was conducted and suggested that we needed 18 participants per group for 80% power at $p = .05$. To account for potential attrition (approximately 20% in our previous studies), and following informed consent, we recruited 48 female adults. Females were recruited because they have demonstrated higher levels of pain, physical disability and pain behavior than men with knee arthritis [10]. The women were medical school staff/faculty with knee arthritis pain (diagnosed by their physicians). They were then randomly assigned to the massage or waitlist control groups ($N = 24$ per group) following informed consent. After attrition, the sample size was 40 ($N = 23$ in the massage group and $N = 17$ in the waitlist control group) (See Fig. 1). The greater attrition in the

control group, although self-reported as “scheduling difficulties” could have also related to remission in knee pain over the waitlist period. This lesser power would be expected to attenuate the predicted treatment effects.

Exclusion criteria were a history of knee surgery within the last two years and any joint replacement. The participants were female adults averaged 47 years of age, were middle income and were distributed 73% Hispanic, 6% Caucasian, 9% African-American, 9% Asian and 3% other. Their education distribution was 60% high school diploma, 27% college degree and 13% graduate degree. The two groups did not differ on these variables.

1.2. Procedure

The participants in the massage group were massaged by a licensed massage therapist once per week for a 4-week period. The 15-min massages (repeated twice during the therapist sessions to total 30 min) consisted of moderate pressure stroking (moving the skin) focused on the quadriceps, the hamstrings and the tendons and ligaments surrounding the patella. The massage protocol was designed by the third author (GG, the massage therapist) (described in Table 1). The participants in the waitlist control group were assessed on the first day and last day of the first month and then were given the same moderate pressure massages on the same schedule as the massage group during the second month.

1.3. Assessments

The participants completed the following assessments before and after the massage sessions on the first and last days of the 4-

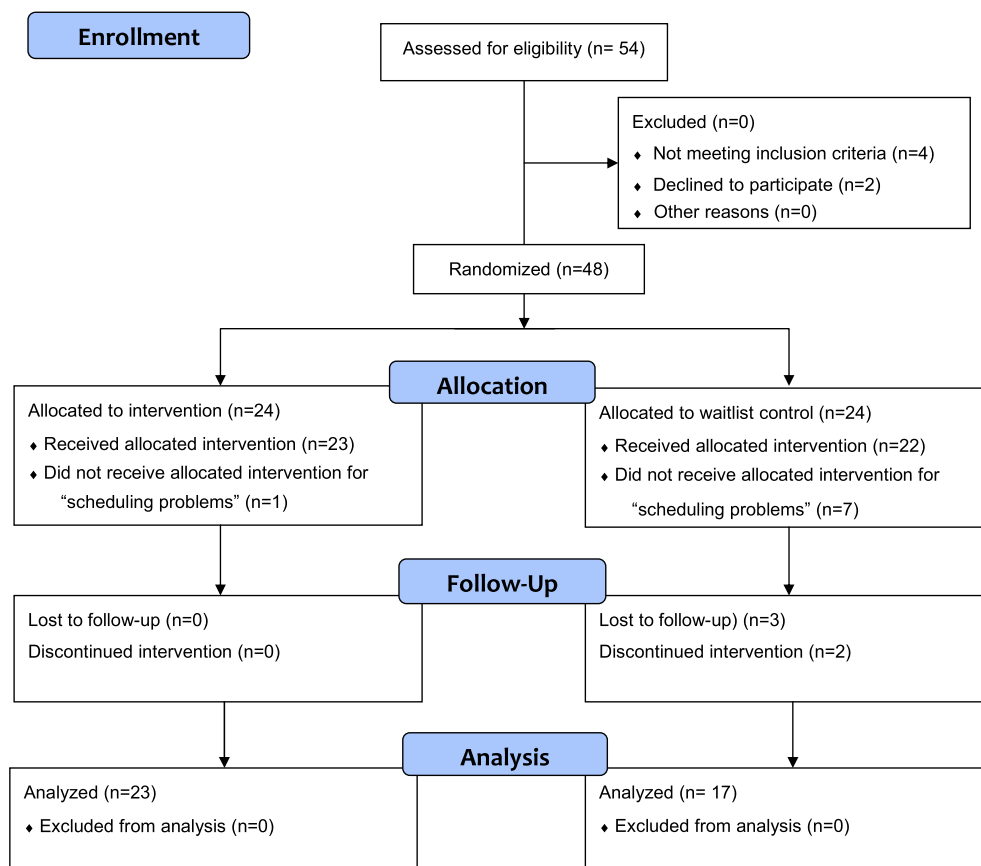


Fig. 1. CONSORT flow diagram.

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