Original Article

Court-Type Traditional Thai Massage Efficacy on Quality of Life among Patients with Frozen Shoulder: A Randomised Controlled Trial

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Background: Frozen shoulder affects up to 5% of the global population. As of 2016, the incidence was estimated to affect at least 2 of every 1,000 people in England. From the epidemiology data of muscle disease, the prevalence of neck and shoulder ache in Thailand was found to be 38.5%. Women were at greater risk than men. The disease happens typically to people aged between 50 to 60 years old. About two-thirds of the patients with shoulder ache from shoulder joint inflammation could be victims of frozen shoulder.

Objective: To investigate the efficacy of court-type traditional Thai massage (CTTM) versus topical diclofenac (TD) on the quality of life related to shoulder functional ability (SFA), disabilities of the arm, shoulder and hand (DASH) and pain intensity (PI) among patients with frozen shoulder.

Materials and Methods: The study design was a randomised single-blind controlled trial. Sixty female patients were randomly assigned to receive CTTM or TD for 6 weeks. Outcome measurements were performed after a 4-week follow-up period. WHOQOL-BREF (Thai version) was used for the quality of life assessment. DASH questionnaires and visual analogue scale (VAS) were used to gauge shoulder functional ability and pain intensity.

Results: Demographic characteristics between CTTM- and TD-patients were equivalent. Quality of life, DASH and VAS scores between 2 groups were not significantly different at baseline. The four-week follow-up period after treatment indicated some improvements on quality of life, shoulder symptoms, functional ability and pain intensity in both groups. In addition, CTTM was found to be superior to TD when treating frozen shoulder.

Conclusion: The present study demonstrated short-term follow-up beneficial effects of CTTM comparable with TD on quality of life as well as shoulder functional ability, and pain intensity among frozen shoulder patients.

Keywords: Court-type traditional Thai massage, Frozen shoulder, Quality of life

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Idiopathic frozen shoulder is a painful and restricted movement of the glenohumeral joint with unknown causes. Apart from shoulder stiffness and pain affecting physical activities, nocturnal pain from frozen shoulder disturbs the patient's sleep[1,2]. This circumstance reduces the quality of life of the patients with frozen shoulder[3]. Massage is a physical therapy alternatively used for the treatment of shoulder pain. This procedure has been found to be effective in improving shoulder pain[4].

Frozen shoulder treatment involves non-medicinal and medicinal approaches to reduce pain and increase the range of motion such as acupuncture, stretching, massage, physiotherapy, non-steroidal anti-inflammatory drugs (NSAIDs), intra-articular injections with steroids and manipulation under anaesthetics[5]. Topical NSAIDs penetrate the skin, enter tissues or joints, and reduce processes causing pain in the tissue. Drug levels in the blood with topical NSAIDs are very much lower than with the same drug taken orally. This minimises the risk of harmful effects[6,7]. Traditional Thai massage (TTM) is an alternative treatment for musculoskeletal illnesses and relaxation. There are two types of TTM i.e. general TTM (or Cha luei sak massage) and the court-type traditional Thai massage (CTTM) (or Ratcha samnak massage). CTTM is a therapeutic massage which has been promoted in health care systems[8,9].

Topical NSAIDs are absorbed through skin, pass tissues or joints while reducing processes which induce pain in the tissue. Topical NSAIDs leave much lower drug levels in the blood compared to those of oral NSAIDs so that the danger of negative effects is reduced[6,7]. Musculoskeletal illnesses can be cured by traditional Thai massage which can

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be applied for relaxation as well.

Court-type traditional Thai massage is a therapeutic massage from traditional Thai medicine wisdom. CTTM practitioners use only their thumbs, fingers or palms to exert pressure through specific points along the body. This massage is recognised as a therapeutic massage beneficial in healthcare system in Thailand especially for patients with musculoskeletal illnesses. CTTM has been reported to improve pressure pain threshold, the cervical range of motion and the quality of life of patients with myofascial pain syndrome in the upper trapezius[8,9].

According to the WHO, quality of life refers to the general well-being of individuals classified into 3 areas: physical, mental, social. One of the physical inabilities which can cause pain, restrict motions and impair quality of life is frozen shoulder a spontaneous and continuous shoulder joint inflammation. In clinical research, the standard measurements of clinical physiology have been chosen as outcome measures for musculoskeletal diseases[10,11] including frozen shoulder while the patients' quality of life has been overlooked. Therefore, researchers have included health-related quality of life as a significant outcome measure in relevant studies. This research aims to assess the efficacy of CTTM versus topical diclofenac (TD) on the quality of life related to shoulder functional ability (SFA), disabilities of the arm, shoulder and hand (DASH) and pain intensity (PI) among patients with frozen shoulder.

Materials and Methods

Subjects

The female patients who had suffered from idiopathic frozen shoulder diagnosed by the orthopedic doctor at the Thai Traditional Medical Service Center, Sukhothai Thammatirat Open University, Nonthaburi province were recruited. The inclusion criteria were idiopathic frozen shoulder stage II (duration of frozen shoulder of 4 to 12 months), the participants aged 40 to 65 years old, the level of pain by visual analog scale (VAS_{pain}) ≥4, loss of shoulder motion in all planes at least two in four positions (abduction, forward flexion, internal rotation, and external rotation) ≥25%, blood pressure not over 140/90 mmHg. The exclusion criteria were those having a history of rotator cuff tears, rheumatoid arthritis, osteoarthritis and malignancies in the shoulder region, pregnancy, the patients of breast cancer surgery; those using steroidal or other drugs to treat frozen shoulder. The sample size was calculated using the range of motion improvement rate from a previous study with 20% drop out[7].

Study procedures

The present study was a randomised single-blind controlled trial. This research was approved by the Ethical Committee of the Department for Thai Traditional and Alternative Medicine of the Ministry of Public Health (Number 10-2016).

After signing informed consent, 60 patients were randomly assigned into 2 arms (n = 30 each) using a pre-generated random assignment scheme enclosed in envelopes. Treatment-group patients received a 45-minute CTTM per session, 2 sessions a week for 6 weeks and were followed-up during the 10th week. The session included stretching by pulling the arm after the massage. Control-group patients received 5 g of TD applied on the average surface of 10x14 cm^2, three times a day for 6 weeks and were followed-up at week 10.

Outcome measures

The quality of life was measured using WHOQOL-BREF questionnaire (Thai version) at baseline and during the 10th week. The questionnaire comprised of 26 items representing physical health domain (7 items), psychological domain (6 items), social relationships domain (3 items), environment domain (8 items), overall perception of quality of life (1 item) as well as overall perception of health (1 item). Each item was rated on a 5-point Likert scale. Shoulder functional ability was assessed by 10-cm visual analog scale (VAS); 0 indicated "usually available" while 10 indicated "actually unworkable". DASH questionnaire was used to evaluate the disabilities of arm, shoulder and hand. It consisted of 30 items regarding disability and symptom components. Higher scores represent higher degree of disabilities. Pain intensity of shoulder was assessed by VAS; 10 centimetres line marked every 1 cm increment with the descriptors "no pain" on the left end and "worst pain" on the right end.

Statistics

Chi-squared test and unpaired t-test were used for demographic characteristics analyses. Paired t-test was used to compare the mean scores between the baseline and the 10th week within each group. Unpaired t-test was used to compare between groups. The data were determined by intention-to-treat (ITT) analysis.

Results

The demographic characteristics between CTTM-patients and TD-patients were equivalent (p>0.05) as shown in Table 1. The quality of life scores in terms of physical health, psychological health, social relationships and environment domains via WHOQOL-BREF were calculated and converted to 0 to 100 transformed scores. At baseline, there were no significant differences in all of the 4 domain scores of quality of life between CTTM-patients and TD-patients. At week 10, there were significant improvements in all domains in both groups (p<0.05). The scores at week 10 showed that CTTM significantly enhanced physical health, psychological health and environment domains which were better than TD (p<0.05) whilst the social relationships domain scores between 2 groups were not significantly different (Table 2). All patients reported the overall perception of health as "Neither satisfied nor dissatisfied" at baseline and improved to "Satisfied" at week 10. The overall perception of the quality of life in CTTM group at week 10 was statistically superior to the baseline. Additionally, the overall perception of the quality of life at week 10 in CTTM group

was more satisfactory than TD group.

The SFA was evaluated using the VAS scores before and after receiving CTTM and TD. A group comparison revealed that both CTTM and TD groups showed significant improvement of function of shoulder with decreased scores (p-value <0.05). In addition, the scores between CTTM and TD groups before and after treatment were not significantly different (Table 2).

For DASH questionnaire, higher scores indicated a greater level of disability/symptom. The DASH scores indicating the disability to do activities and the severity of symptoms between CTTM and TD groups were equivalent at baseline and significantly decreased at week 10 (p<0.05).

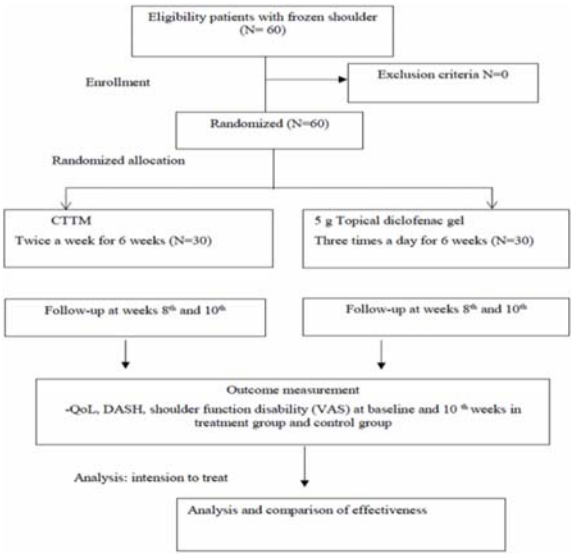

Figure 1. Participant flowchart.

The shoulder function disability after CTTM treatment was significantly better than TD treatment (p<0.05). However, the symptom severity after treatment between 2 groups was not different (Table 2).

Pain intensity between CTTM and TD groups was equivalent at baseline. Also, both CTTM and TD groups showed significant decrease in pain intensity at week 10 (p<0.05), but VAS scores of CTTM group was

Table 1. Demographic characteristics

	CTTM	TD
Age (years)	53.9±4.7	53.3±4.2
Education (%)		
Lower than bachelor	3.3	10.0
Bachelor	90.0	83.3
Higher than bachelor	6.6	6.6
Occupation (%)		
Civil servants	76.6	73.3
Employees	3.3	23.3
Merchant	13.3	3.3
Other	6.6	0
Side of symptom shoulder (%)		
Left	56.6	36.6
Right	43.3	63.3
Active range of motion (degree)		
Abduction	116.5±19.5	120.2±19.3
Flexion	129.6±16.1	132.1±16.7
Internal rotation	52.2±7.1	52.5±6.7
External rotation	41.6±8.9	43.3±8.6
Passive range of motion (degree)		
Abduction	134.2±13.5	137.2±12.7
Flexion	142.8±9.2	143.5±10.5
Internal rotation	58.9±3.3	59.1±3.0
External rotation	49.1±8.6	52.1±6.7
Pain intensity (VAS score)	6.4±0.6	6.1±0.8
Shoulder functional ability (VAS score)	6.0±0.7	5.9±0.7

Table 2. Quality of life, shoulder function and severity in patients with frozen shoulder receiving CTTM or TD treatment

	CTTM		TD	
	Baseline	Week 10th	Baseline	Week 10th
Quality of life (WHOQOL-BREF)				
Physical domain	64.7±4.5	85.8±3.6*,**	64.5±5.4	76.5±4.7*,**
Psychological domain	74.6±4.1	86.6±5.5*,**	75.0±4.7	80.7±4.1*,**
Social relationship domain	73.2±4.9	78.5±6.5*	72.9±6.5	76.2±6.4*
Environment domain	74.2±3.4	81.7±6.5*	72.4±4.6	73.6±4.4*
Shoulder functional ability (VAS)	6.0±0.7	3.0±0.7*	5.9±0.7	3.1±0.6*
Disability of arm shoulder and hand (DASH)				
Function disability	75.0±12.5	28.5±7.9*,**	72.9±10.2	37.3±3.9*,**
Symptom severity	73.7±11.7	36.8±13.2*	75.0±12.3	36.6±5.1*
Pain intensity (VAS)	6.4±0.6	2.5±0.6*,**	5.9±0.7	3.1±0.6*,**

* p<0.05 comparison at baseline and week 10th, ** p<0.05 comparison between CTTM and TD groups

significantly better than those of TD group (Table 2).

Discussion

The goal of treating patients with frozen shoulder is to improve shoulder range of motion and to control pain. The finding of DASH scores reflects the treatment of the frozen shoulder in terms of the function disability and symptom severity because a significant decrease of scores was considered as an achievement of gold standard treatment. The results of shoulder functional ability and pain intensity can be explained in terms of physical effects. Massage is used for therapy in order to reduce pain, anxiety, depression, muscle tension and increase joint range of motion[11,12]. Massage also calls up the body's natural painkillers because it can stimulate the release of endorphins, the morphine-like substances that the body manufactures into the brain and nervous system. As the gate control theory, CTTM essentially involves the exertion of pressure on the skin and muscles, thereby stimulating pressure receptors and inhibiting the transmission of pain receptors at the spinal cord or the 'gate'. The findings of the present study are consistent with those of previous research. For instance, Juntakarn et al studied the immediate effect of 4-weeks of traditional Thai massage and found that it could reduce pain and functional deficits related to pain in patients with non-specific low back pain[13]. Therefore, these better scores and results improved the overall quality of life because physical well-being generally contributes to better quality of life among patients with frozen shoulder. Also, Boonruab et al studied the effectiveness CTTM in quality of life and pain intensity among patients with myofascial pain syndrome in the upper and middle trapezius. The results showed that CTTM significantly increased quality of life and decreased pain intensity[14].

Topical diclofenac gel could reduce pain intensity and increase shoulder range of motion because TD has analgesic, anti-pyretic, and anti-inflammatory effects so that it will also increase joint range of motion. Therefore, TD is commonly used for acute or chronic musculoskeletal pain. It is applied directly to the area of pain on the skin, back, or joint. Niempoong et al conducted a double-blind, randomised controlled trial on the comparison between plygersic gel with the combination of 4% ginger and plai extract and diclofenac gel with 1% solution among patients with osteoarthritis knees. Both plygersic gel and diclofenac gel are effective in reducing knee joint pain and symptoms significantly while promoting daily activities, sports activities as well as quality of life[7].

The present study has demonstrated the short-term follow-up beneficial effects of CTTM and TD on shoulder functional ability and symptom as well as their beneficial effects on the overall quality of life of frozen shoulder patients. However, only female patients aged between 40 and 65 years old were recruited; therefore, the results could not be generalised to a larger population. The non-generalisability is considered as the limitation of this research.

Conclusion

In conclusion, according to the research findings from QoL, SFA and pain intensity, CTTM is as effective and comparable to TD in treating frozen shoulder, enhancing physical activities as well as improving the quality of life of patients without any side effects.

What is already known on this topic?

Frozen shoulder is the disease whose incident rate has increased continuously affecting the quality of life among the patients because of the night pain and the frozen shoulder symptoms impairing their daily activities but CTTM and TD can be used to treat frozen shoulder. CTTM and TD can reduce the shoulder pain and increase the range of motion among the patients. In contrast, it is superior to TD because CTTM can improve the quality of life better than TD so that the patients recover and live their normal life again.

What this study adds?

The present study reveals that CTTM and TD can improve the quality of life among the patients. However, CTTM is more effective without any side effects compared to TD because CTTM can relieve the shoulder symptoms, improve the function ability and reduce the pain intensity among the patients.

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Potential conflicts of interest

The authors declare no conflict of interest.

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