

The Effects of Applied Thai Traditional Massage Combined with Knee Exercise on Knee OA Patients: A Case Study of Ban Kracheng Community Health Promoting Hospital, Pathum Thani Province, Thailand

Nitipun Boonperm¹, Phanida Wamontree², Nittaya Putthumruga³, Khongdet Phasinam⁴, Dowroong Watcharinrat⁵, Rosarin Taksin^{6*}

^{1,3,6}Faculty of Integrative Medicine, Rajamangala University of Technology Thanyaburi, Pathum Thani, Thailand

²School of Integrative Medicine, Mae Fah Luang University, Chiang Rai, Thailand

⁴Faculty of Food and Agricultural Technology, Pibulsongkram Rajabhat University, Phitsanulok, Thailand

⁵School of Liberal Arts, Shinawatra University, Pathum Thani, Thailand

Email: Rosarin_T@rmutt.ac.th

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Abstract

The present study aimed to examine the effects of applied Thai traditional massage combined with knee exercise on knee osteoarthritis (OA) patients. To achieve the research objective, a randomized controlled trial was conducted. The data were collected from 31 knee OA patients using a survey questionnaire, a 10-level pain intensity assessment scale, the Western Ontario and McMaster Universities Osteoarthritis Index, and the Thai version of the Oxford Knee Score translated by the Royal College of Orthopaedic Surgeons of Thailand. Then the data were analyzed using descriptive statistics and the paired sample t-test. The results showed that the majority of the subjects were female aged 60 or over. After the administration of the treatment, almost three-fourths reported experiencing less severe OA and lower knee pain. Also, a pre- and post-treatment comparison revealed increased knee range of extension and flexion measured with a goniometer and improved quality of life at the significance level of 0.05. Based on the findings, it can be concluded that applied Thai traditional massage combined with knee exercise can effectively alleviate OA by relieving muscle contraction, enhancing blood circulation, and strengthening the knee joint.

Keywords: Applied Thai traditional massage, Knee exercise, Osteoarthritis (OA) patients, Case study.

INTRODUCTION

Osteoarthritis (OA), the most common form of arthritis, occurs as a result of the abnormality of cartilage that causes formal, structural, and chemical changes to the cushion of the joint. As a hard yet flexible tissue, the cartilage reduces impact on the joint and enables frictionless joint motion. If it is worn down and becomes thinner, the bones will rub against each other, leading to crepitus and pain. As OA develops in severity, it can cause increased swelling and inflammation, decreased range of motion, joint instability, or even joint deformation.

Knee OA is a major health concern facing middle-aged and elderly people. Its incidence rate is on the rise with the global number of patients standing between 1,700 and 2,693 per 100,000 population.¹ In Thailand, knee OA is the third most common illness among the elderly with the incidence rate of 10% of those aged 55 or over population.² Factors that increase the risk of knee OA are aging, obesity, congenital joint disorders involving hardening of the articular cartilage, joint injury, and overuse of the joint causing repeated trauma. Knee OA can have an adverse impact on the quality of life if left untreated or not dealt with appropriately and in a timely manner.

Widely administered knee OA treatment includes surgery and the prescription of oral pain medication. Due to their side effects, however, treatment regimens involving alternative medicine have been developed. In Thailand, research abounds that examines the administration of applied Thai traditional massage or the combination of such a therapy with oral pain medication. For instance, Chiranthanut et al. (2014)³, compared the effects of Thai massage combined with Thai herbal compress and ibuprofen on knee OA patients, discovering that both the treatments had comparable clinical efficacy. Kalarat (2002)⁴, reported that Thai massage could relieve pain in elderly patients with knee OA.

Therefore, the objective of the present study was to evaluate the effects of applied Thai traditional massage combined with knee exercise on the knee OA patients at Ban Kracheng Community Health Promoting Hospital, Pathum Thani province, Thailand. At the time of the research, the hospital had 252 elderly patients with chronic illness, as many as 176 of which suffered from knee OA. If the administration of applied Thai traditional massage in conjunction with knee exercise proves effective in alleviating knee OA severity and pain, it can serve as readily available guidelines on enhancing knee OA patients' quality of life for hospital staff and healthcare practitioners and on improving self-care behavior for such patients.

Literature review

Knee OA is classified into two types according to its causes: primary and secondary. Primary knee OA results from the degeneration of the cartilage the cause of which is not known. In contrast, secondary knee OA is triggered by specific factors leading to cartilage breakdown, most commonly injury, obesity, inactivity, genetics, and inflammation. Knee OA often affects people aged 45 or over due to the onset of the degeneration of their meniscus and patello-femoral joint and ligament sprains. Most knee OA patients experience pain, reduced flexion lower than 120 to 150° from the 0° extension, and poor quality of life. The normal active range of motion is depicted in Figure 1.

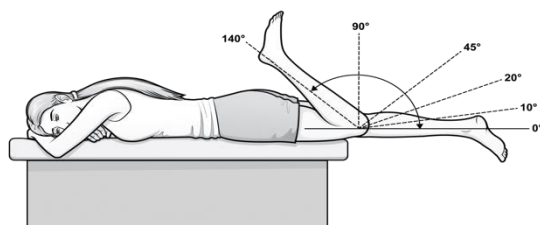


Figure.1: Normal active range of motion.5

The severity of knee OA varies depending on flexion, starting from normal with the flexion of as much as 100° to 150° to severe with the flexion of as low as 60°, as displayed in Table 1.

Table 1: Knee OA severity across flexion and flexion contracture ranges.

<i>Severity levels</i>	<i>Flexion ranges (°)</i>	<i>Flexion contracture ranges (°)</i>
Normal	100-150	0-4
Mild	80-109	5-9
Moderate	60-79	10-19
Severe	<60	≥20

Knee OA treatment involves surgical and non-surgical approaches. Non-surgical approaches include oral pain medication, physiotherapy, behavioral modification, weight loss, joint trauma reduction, exercise, and alternative therapy, such as herbal medicine prescription and massage. In Thailand, the most widely administered alternative therapy is applied Thai traditional massage due to its proven benefits to blood circulation and muscle tissue flexibility. The choice between surgical and non-surgical treatment is determined by a multitude of factors, most notably the severity of knee OA.

Materials and Methods

DMF Prevents CIN- in Rats

The present study was a controlled trial following a two-group random assignment pre-test-posttest design conducted at Ban Kracheng Community Health Promoting Hospital, Pathum Thani province, Thailand during December 2016 and May 2017. Initially, 36 patients aged 45 or over who had been clinically diagnosed with primary knee OA according to the criteria stipulated by the Royal College of Orthopaedic Surgeons of Thailand were recruited. However, two were unable to participate in the research due to their physical condition, while three wished not to be involved. The remaining 31 subjects were asked to sign a consent form and notified of their right to withdraw from the research at any time or for any reason. Then their demographic information and past medical history were collected. Also, their knee pain, knee range of motion, knee OA severity, and quality of life were assessed using a 10-level pain intensity scale, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), the Thai version of the Oxford Knee Score (OKS) translated by the Royal College of Orthopaedic Surgeons of Thailand, respectively. Subsequently, the subjects were given a two-week treatment incorporating applied Thai traditional massage and knee exercise. During and following the treatment period, the aforementioned indicators

were evaluated using the same instruments. Finally, the data were analyzed using descriptive statistics and the paired sample t-test at the significance level of 0.05. The conceptual framework guiding this experimental study is illustrated in Figure 2.

Over the two-week period, the subjects were administered five sessions of applied Thai traditional massage conducted three days apart comprising the following types of compression.

- Femoral artery massage
- Massage of knee signal spots 1, 2, and 3
- Massage of outer leg signal spots 1, 2, 3, and 4, focusing on 4, with the knee joint being flexed
- Massage of inner leg signal spots 1, 2, 3, and 4, focusing on 3 and 4, with the knee joint being flexed

Also, they were asked to do knee exercise twice daily following the six moves detailed below.

Move 1. Lie supine with a small pillow or rolled towel placed under the knees. Stretch the knees while tightening the muscle around the patellas. Hold the move for 10 seconds and repeat it 5-10 times.

Move 2. Sit on a chair and rest one leg on another. Make sure to stretch the knee. Tighten the muscle around the patella. Hold the move for 10 seconds. Alternate with the other leg.

Move 3. Sit on a chair. Raise one leg. Stretch the knee while extending the foot at the ankle. Hold the move for 10 seconds and repeat it 5-10 times. Alternate with the other leg.

Move 4. Sit cross-legged on a chair with the legs raised. Raise the lower leg against the upper one. Tighten the muscle. Hold the move for 10 seconds. Alternate with the other leg.

Move 5. Sit cross-legged on a chair with the legs raised. Lower the upper leg against the lower one. Tighten the muscle. Hold the move for 10 seconds. Alternate with the other leg.

Move 6. Hold a chair, squat down, and stand up straight. Repeat the move 10-20 times.

RESULTS and DISCUSSION

This research was a randomized controlled trial aiming to assess the effects of applied Thai traditional massage combined with knee exercise on the knee OA patients at Ban Kracheng Community Health Promoting Hospital, Pathum Thani province, Thailand. In terms of their demographic characteristics, the subjects were comprised mainly of females (90.3%) aged over 60 (71.0%). Nearly three-fourths (74.2%) did a job involving a high degree of walking prior to the onset of knee OA although slightly over half (51.6%) had no family history of knee OA. The findings are displayed in Table 2.

As regards their food and beverage consumption habits, the majority of or almost all the subjects reported consuming glutinous rice, bamboo shoots, offal, poultry, and beer once in a while or not consuming such foods at all with the figures ranging between 80.7% and 93.6%. However, 32.3% still had vining vegetables. The results are illustrated in Table 3.

Regarding their use of medication and exercise, over four-fifths of the subjects took knee OA medication once in a long while or did not take any knee OA medication at all. Those taking knee OA medication purchased their medication from a drugstore (29.0%). Although the majority (71.0%) had no congenital disease, almost half (48.4%) reported taking other medications. The findings are presented in Table 4.

Prior to the treatment, the majority of the subjects had moderate knee OA (41.9%) and mild knee OA (32.3%). Following the completion of the treatment, the subjects exhibited a significant improvement with the majority assessed to have normal knee condition (41.9%). The results are shown in Table 5.

Over the 1st to 4th treatment sessions, the subjects seemed to exhibit constantly changing knee range of motion with the percentage of those reporting improved extension and flexion ranging between 16.1% and 54.8%. Following the last treatment session, however, the percentage of those experiencing improved extension and flexion reached 58.1%. The findings are depicted in Table 6.

Around the 1st treatment session, the majority suffered severe pain (7) (32.3%), followed by those feeling moderate pain (6) (19.4%) and severe pain (8) (16.1%), while none experienced no or mild pain (1). As soon as the 3rd treatment, some began to feel only mild pain (1) (6.5%). Following the last treatment, as many as 6.5% and 25.8% reported feeling no or mild pain (1), respectively, whereas none suffered severe pain (7 and 8). The results are displayed in Table 7.

A comparison of the knee range of extension indicated a statistically significant improvement after all the treatment sessions at the significance level of $p < 0.05$. Similarly, the knee range of flexion significantly improved after almost all the treatment sessions at the significance level of $p < 0.05$, except for the 2nd and 3rd ones. The findings are illustrated in Tables 8 and 9.

In terms of their overall quality of life, the subjects enjoyed a statistically significant improvement after the treatment at the significance level of $p < 0.05$. The results are presented in Table 10.

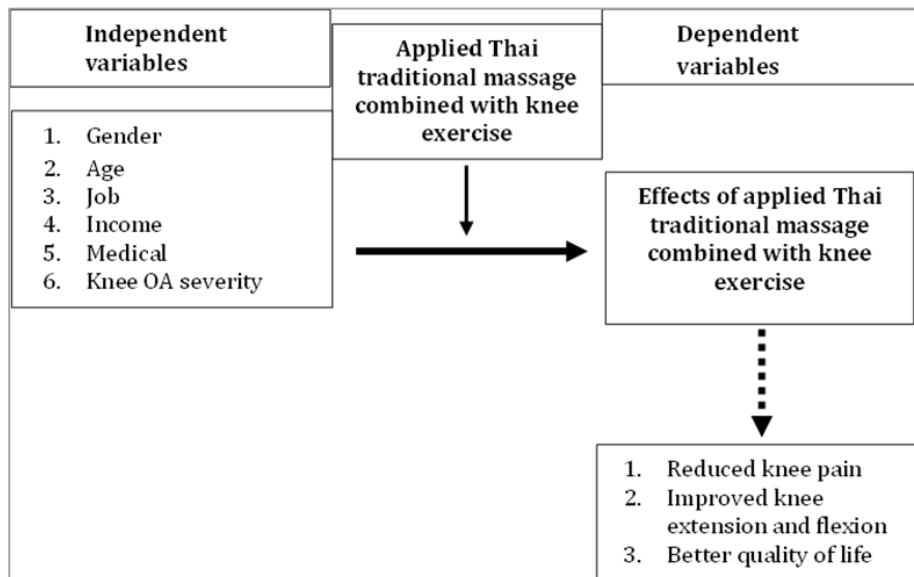


Figure 2: Conceptual framework of the study.

Table 2: Subjects' demographic characteristics

<i>Demographic characteristics</i>	<i>No. of subjects</i>	<i>Percentage</i>
Gender		
Male	3	9.7
Female	28	90.3
Age		
45-50 years	3	9.7
41-55 years	1	3.2
56-60 years	5	16.1
Over 60 years	22	71.0
Job nature prior to the onset of knee OA		
Sitting	2	6.5
Standing	6	19.4
Walking	23	74.2
Current job nature		
Sitting	7	22.6
Standing	8	25.8
Walking	16	51.6
Family history of knee OA		
Yes	15	48.4
No	16	51.6

Table 3: Food and beverage consumption habits.

<i>Types of food and beverages consumed</i>	<i>No. of subjects</i>	<i>Percentage</i>
Glutinous rice		
Consumed glutinous rice regularly	3	9.7
Consumed glutinous rice once in a long while	27	87.1
Did not consume glutinous rice at all	1	3.2
Bamboo shoots		
Consumed bamboo shoots regularly	6	19.4
Consumed bamboo shoots once in a long while	23	74.2
Did not consume bamboo shoots at all	2	6.5
Offal		
Consumed offal regularly	2	6.5

	Consumed offal once in a long while	13	41.9
	Did not consume offal at all	16	51.6
Poultry			
	Consumed poultry regularly	5	16.1
	Consumed poultry once in a long while	20	64.5
	Did not consume poultry at all	6	19.4
Vining vegetables			
	Consumed vining vegetables regularly	10	32.3
	Consumed vining vegetables once in a long while	20	64.5
	Did not consume vining vegetables at all	1	3.2
Beer			
	Consumed beer regularly	2	6.5
	Consumed beer once in a long while	3	9.7
	Did not consume beer at all	26	83.9

Table 4: Use of medication and exercise.

<i>Use of medication and exercise</i>		<i>No. of subjects</i>	<i>Percentage</i>
Knee OA medication			
	Took knee OA medication regularly	5	16.1
	Took knee OA medication once in a long while	14	45.2
	Did not take any knee OA medication	12	38.7
Sources of medication			
	Did not take any knee OA medication	12	38.7
	Physicians	8	25.8
	Drugstores	9	29.0
	General stores	2	6.5
Congenital disease			
	Yes	9	29.0
	No	22	71.0
Other medications taken			
	No	16	51.6
	Yes	15	48.4
Exercise frequency			
	Exercised regularly	14	45.2
	Exercised once in a long while	15	48.4
	Did not exercise at all	2	6.5

Table 5: Knee OA severity.

<i>Levels of severity</i>	<i>Pre-treatment</i>		<i>Post-treatment</i>	
	<i>No. of subjects</i>	<i>Percentage</i>	<i>Number of subjects</i>	<i>Percentage</i>
Severe (Score range: 0-19)	4	12.9	1	3.2
Mild (Score range: 20-29)	10	32.3	5	16.1
Moderate (Score range: 30-39)	13	41.9	12	38.7
Normal (Score range: 40-48)	4	12.9	13	41.9

Table 6: Knee range of motion.

<i>Knee range of motion</i>	<i>1st treatment</i>		<i>2nd treatment</i>		<i>3rd treatment</i>		<i>4th treatment</i>		<i>5th treatment</i>	
	<i>No.</i>	<i>Percentage</i>	<i>No.</i>	<i>Percentage</i>	<i>No.</i>	<i>Percentage</i>	<i>No.</i>	<i>Percentage</i>	<i>No.</i>	<i>Percentage</i>
Improved extension and flexion	17	54.8	5	16.1	11	35.5	5	16.1	18	58.1
No improvement	12	38.7	8	25.8	13	41.9	11	35.5	11	35.5
Worsened extension and flexion	2	6.5	18	58.1	7	22.6	15	48.4	2	6.5

Table 7: Levels of pain.

Levels of pain	1 st treatment		2 nd treatment		3 rd treatment		4 th treatment		5 th treatment	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
No pain (0)	0	0	0	0	0	0	2	6.5	2	6.5
Mild pain(1)	0	0	0	0	2	6.5	3	9.7	8	25.8
Mild pain(2)	2	6.5	2	6.5	3	9.7	7	22.6	7	22.6
Mild pain(3)	2	6.5	4	12.9	7	22.6	6	19.4	8	25.8
Moderate pain (4)	3	9.7	9	29	10	32.3	6	19.4	2	6.5
Moderate pain(5)	3	9.7	4	12.9	6	19.4	4	12.9	3	9.7
Moderate pain(6)	6	19.4	8	25.8	3	9.7	1	3.2	1	3.2
Severe pain(7)	10	32.3	3	9.7	0	0	1	3.2	0	0
Severe pain(8)	5	16.1	1	3.2	0	0	1	3.2	0	0

Table 8: Pre- and post-treatment knee range of extension.

Knee range of extension	Pre- and post-treatment		
	Mean difference	t	p-value
Before and after the 1 st massage	-4.871	-3.678	.001*
Before and after the 2 nd massage	-3.93548	-4.060	.000*
Before and after the 3 rd massage	-4.129	-5.333	.000*
Before and after the 4 th massage	-7.032	-4.573	.000*
Before the 1 st massage and one week after the last massage	-6.806	-3.804	.001*

* Significant at p<0.05

Table 9: Pre- and post-treatment knee range of flexion.

Knee range of flexion	Pre- and post-treatment		
	Mean difference	t	p-value
Before and after the 1 st massage	1.806	2.533	.017*
Before and after the 2 nd massage	.613	1.740	.092
Before and after the 3 rd massage	.613	1.697	.100
Before and after the 4 th massage	.613	2.426	.021*
Before the 1 st massage and one week after the last massage	1.935	2.382	.024*

* Significant at p<0.05

Table 10: Pre- and post-treatment quality of life.

Quality of life	Pre- and post-treatment		
	Mean difference	t	p-value
Before and after the treatment	-.645	-4.502	0.000*

* Significant at p<0.05

CONCLUSIONS

The objective of this randomized controlled trial was to evaluate the effects of applied Thai traditional massage combined with knee exercise. It was found that the subjects were predominantly females aged over 60, consistent with current statistics indicating knee OA as one of the most common illnesses among elderly patients.² In addition, the nature of their job prior to the time of the study mainly involved walking, supporting the 2015 research by the Division of Noncommunicable Diseases of the Department of Disease Control demonstrating that muscle, bone, and joint problems are likely to result directly from ergonomic risk factors caused by occupational exposure, such as prolonged static posture and/or repetitive movement. However,

their sustenance comprised very low amounts of glutinous rice, bamboo shoots, offal, poultry, vining vegetables, and beer – a finding that warrants further research as it contradicts the traditional belief about the relationships between the consumption of certain foods and knee OA prognosis.

Prior to the treatment, the subjects' knee OA condition was rated at mild to moderate levels with the knee range of extension and knee range of flexion being limited and the pain intensity being moderate to severe. During and following the treatment, these indicators were found to improve significantly, contributing to better quality of life. The present findings provide corroborative evidence for a great deal of previous research demonstrating the effectiveness of non-medicinal therapy in the management of joint deterioration, such as Wajajamroen et al. (2016)⁶ study on the relationships between massage treatment and knee OA patients' improved quality of life, Punnee et al. (2014)⁷ report on the effects of Thai traditional massage therapy on improvements in terms of pain, walking ability, and quality of life among older knee OA patients, and Jumpangern (2007)⁸ thesis examining how Thai massage enhanced the health-related quality of life of patients with musculoskeletal disorders, to name but a few.

As the present findings show, a treatment regime combining applied Thai traditional massage and knee exercise can improve the knee condition and quality of life of knee OA patients, likely because of its effectiveness in relieving muscle contraction, enhancing blood circulation, strengthening the muscle tissue, and hence increasing the knee range of motion. Therefore, this integrative treatment should be promoted among medical professionals and patients.

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