

## Knowledge and Knowledge Management of Herb and Yam Khang Treatment of School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University\*

### ความรู้และการจัดการความรู้เรื่องสมุนไพรกับการรักษาโรคแบบย่ำขางของวิทยาลัย การแพทย์พื้นบ้านและการแพทย์ทางเลือก มหาวิทยาลัยราชภัฏเชียงราย

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#### Abstract

The study attempted to develop and manage knowledge of oriental traditional medicine to improve the connection with western medicine. Limitation on comparing with western medicine was due to lack of in-depth analysis on knowledge and management of some successful cases of western medical treatment. Therefore, this study aimed to analyze knowledge management by using Yam Khang treatment as a case study, which the concept of knowledge and knowledge management was used to 1) collect and analyze the treatment knowledge, and 2) analyze and interpret the treatment result with knowledge of oriental traditional medical comparing with western medical knowledge as done by School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University. The study reviewed literatures, captured and organized the tacit knowledge of muscle and ligament pain from successful traditional healer. The results found that the knowledge of four-element balance is complicate and effective. The patients were obviously recovered after applying Yam Khang treatment using heat from burned Khang plate accompany with heat from Plai's active

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\* The article aimed to study knowledge of four elements as a basic to delve into dynamic component in subsystem toward diagnosis of unbalance and increase in element component. It also aimed to study content of treatment and result as a principle to apply for patients with various symptoms and conditions.

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ingredient (providing heating action as synergist of burned Khang plate's heat) to balance the subsystem of four elements or increase mass of dynamic elements. Explanation of this study may improve the connection between oriental and western medicine and may support interpretation of the case study on oriental medicine for society of modern medicine.

**Keywords:** Knowledge and Knowledge Management, Western Epistemology, Eastern Epistemology, Yam Khang, Plai

### บทคัดย่อ

การวิจัยนี้มีความพยายามในการพัฒนาองค์ความรู้และการจัดการความรู้การแพทย์แผนตะวันออกที่สามารถสื่อสารกับการแพทย์แผนตะวันตกได้ดียิ่งขึ้น แต่ที่ผ่านมามีข้อจำกัดยังไม่มีการวิเคราะห์ให้เข้าใจเทียบเคียงกันกับการแพทย์แผนตะวันตก ทั้งนี้เนื่องมาจากองค์ความรู้และการจัดการเกี่ยวกับโรคที่แพทย์แผนตะวันออกรักษาอย่างได้ผลยังไม่มีการวิเคราะห์แบบบล็อก งานวิจัยนี้จึงมุ่งสังเคราะห์การจัดการความรู้ โดยใช้การรักษาโรคแบบย่ำขางเป็นกรณีศึกษา โดยมีวัตถุประสงค์ที่จะใช้แนวคิดเกี่ยวกับความรู้และการจัดการความรู้ไป 1) รวบรวมและวิเคราะห์เนื้อหาของความรู้ และ 2) วิเคราะห์และนำเสนอผลของการรักษาโรคแบบย่ำขางด้วยเนื้อหาความรู้จากทางการแพทย์แผนตะวันออกแล้วนำเสนอผลเทียบเคียงกับการแพทย์แผนตะวันตกได้โดยวิทยาลัยการแพทย์พื้นบ้านและการแพทย์ทางเลือก มหาวิทยาลัยราชภัฏเชียงราย การวิจัยนี้ใช้วิธีการวิจัยด้วยการทบทวนจากเอกสาร การถอดความรู้แบบฝังลึกในกลุ่มอาการปวดกล้ามเนื้อและเอ็นจากหมอเมืองที่ประสบความสำเร็จ และจัดระบบความรู้แบบฝังลึกให้ได้มาซึ่งเนื้อหาความรู้ที่นั้น ผลการวิจัยพบว่า ความสมดุลของธาตุทั้ง 4 เป็นความรู้ซับซ้อนและได้ผล มีการรักษาแบบย่ำขางโดยการใช้ความร้อนจากแผ่นขางไฟ เพิ่มประสิทธิภาพด้วยการใช้ความร้อนจากตัวยางของไฟลที่มีคุณสมบัติเป็นยารสร้อน ซึ่งเป็นการเสริมฤทธิ์ความร้อนเข้าร่วมกับความร้อนจากแผ่นขางไฟ เพื่อเข้าไปปรับการเสียสมดุลในระบบย่อยของธาตุทั้ง 4 หรือเพิ่มมวลสารของธาตุที่เป็นพลวัต ทำให้ผู้ป่วยมีอาการดีขึ้นอย่างชัดเจน คำอธิบายของงานนี้น่าจะมีส่วนทำให้การสื่อสารของการแพทย์ทั้ง 2 ระบบดีขึ้น อีกทั้งทำให้เนื้อหาในกรณีศึกษาทางการแพทย์แผนตะวันออกสามารถสื่อสารในวงการทางการแพทย์สมัยใหม่ได้มากขึ้น

**คำสำคัญ :** ความรู้และการจัดการความรู้ ญาณวิทยาตะวันตก ญาณวิทยาตะวันออก ย่ำขาง ไฟล

## Introduction

Folk medicine bases on oriental traditional medicine that analyzes cause and effect of symptoms for holistic solution depended on synthetic study and nature, whereas western medicine focuses on partial approach and empirical result. Folk medicine defines illness as the effects of alteration of four elements (earth, water, wind and fire) that form human body. Thus, the healing principle emphasizes balance of four elements. Yam Khang treatment with herbs also bases on the concept of four-element balance in the body relating to emotion, sense and external factors, such as weather and posture (Irvine, 1982). Alteration of elements causes body imbalance and illness.

Oriental traditional medicine is continuously developed to be a healthcare alternative of Lanna people and is moderately accepted by western medicine. School of Traditional and Alternative medicine, Chiang Rai Rajabhat University led by Dr. Yingyong Taoprasert also develops knowledge of folk medicine by revising knowledge of traditional healers since 2000 and creating the main reference book on Lanna traditional medicine. After that, the development has expanded by upgrading academic standing of traditional healers to learn the correct knowledge of Lanna traditional medicine before adjusting to local health service system. Although, Lanna traditional medicine is challenged by western medical treatment that has more modern practice and instruments, revision of traditional medical knowledge led cooperation between traditional healers and technical officers emerging the reference book on traditional healer knowledge. Department for Development of Thai Traditional and Alternative Medicine, Ministry of Public Health was also pushed to establish. In addition, Chiang Rai Rajabhat University has used knowledge from the reference book in undergraduate and postgraduate courses (Taoprasert, 1998). Success of all actions helps reducing the gap between oriental and western medicine.

The previous study on traditional medical knowledge brought effective disease management. School of Traditional and Alternative Medicine created description of modern epistemology that strengthened alternative medicine or traditional healers. Practical knowledge from results of analysis, synthesis, repetitive tests and experiments will become theoretical knowledge that can be effectively used for public benefit, such as causes of disease and illness. The case study on Yam Khang treatment also gave the obvious result that showed unbalance of body elements causing illness. However, knowledge of four-element interaction causing balance or unbalance is unknown. Excess and unbalanced interaction was cause of muscle and ligament pain, which wind element affected unbalance of water, fire and earth elements. It indicated that knowledge analysis and operation were superficially managed because the knowledge came from

experience on Yam Khang treatment with herb. Knowledge capture and successful result on applying the knowledge to treatment are still not complete. In addition, content of knowledge with clear explanation is needed.

Therefore, the study aimed to analyze knowledge management by using Yam Khang treatment as a case study, which the concept of knowledge and knowledge management was used to 1) collect and analyze the treatment knowledge, and 2) analyze and interpret the treatment result with knowledge of oriental traditional medical comparing with western medical knowledge as done by School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University. The study focused on applying concept and theory of knowledge and knowledge management to understand holistic relationship, which included 1) relationship between four elements in the body and from outside, and 2) characteristic of the relationship. The study based on oriental medical knowledge that believes in unbalance of four elements causing illness. Relationship of four elements inside and outside the body, specific healing approach of Yam Khang treatment with herb and successful treatment result (within three treatment times) of patients with muscle and ligament pain syndrome were described.

### **Methodology**

Data triangulation method with combination method of data collection, observations, in-depth interviews, and document analysis was used in qualitative research (Ngulube, 2015). In-depth interview with traditional healer was done for collecting data on tacit knowledge. The observational study had the author as an observer to consider a traditional healer's treatment. The sampling group included ten patients with muscle and ligament pain syndrome including men and women in the age of 28-70 years old who were completely cured by traditional healer or felt better within less than three treatment numbers. Nine groups of symptom consisted of neck-shoulder pain (1 patient), back pain (2 patients), wrist pain (1 patient), right shoulder pain (1 patient), waist pain (1 patient), right breast tension (1 patient), elbow pain (1 patient), right arm muscle pain (1 patient) and right ankle pain (1 patient). Documents of western epistemology were analyzed to compare with traditional healer's phenomenon on diagnosis and treatment of muscle and ligament pain.

#### **Data collection tools**

1) In-depth interview questions to collect knowledge and knowledge management of traditional healer, such as knowledge storage, four-element unbalance, diagnosis, treatment, problem and learning obstacle.

2) Dialogue for individual informants including taking notes, observation form, voice recorder and video recorder.

### **Research process**

The process included research planning, following the plan, data collection and data reflection, which the details are as follows:

1) Collecting preliminary data at Tumbol Rong Chang, Amphoe Pa Daet, Changwat Chiang Rai using questionnaires about tacit knowledge to interview 1) a traditional healer (Mr. Samran Mafu), and 2) ten patients in symptom of muscle and ligament pain (who recovered within three times of treatment).

2) The study interviewed traditional healer about 1) successful treatment of muscle and ligament pain syndrome, 2) tacit knowledge of diagnosis and use of Khang (is heated up with brazier) and Plai (is transformed into Plai oil) for Yam Khang treatment, and 3) knowledge on bringing external elements in and out the body to adjust unbalance of four elements, which fire and wind were introduced into unbalance point to balance four elements. It can be said that successful treatment gave knowledge of special characteristic of heat from Khang plate accompanying with Plai oil and knowledge of increase or decrease in mass of external elements to balance internal elements. The results will develop knowledge and knowledge management of eastern epistemology to connect and compare with western epistemology properly.

### **Data verification**

Data on successful treatment were used to find relationship between oriental medical knowledge (holistic diagnosis) and western medicine (partial diagnosis), which then explanation was applied for treatment further.

## **Results**

### **Background of patients with muscle and ligament pain**

All ten patients showed in nine groups of symptom including neck-shoulder pain, back pain, wrist pain, right shoulder pain, waist pain, right breast tension, elbow pain, right arm muscle and right ankle pain were completely cured within three times of Yam Khang treatment with Mr. Samran.

**Table 1:** Treatment result of ten patients with muscle and ligament pain syndrome of Mr. Samran Mafu

| Symptom               | Patient number |       | Age | Occupation               | Treatment times | Results |        |          |
|-----------------------|----------------|-------|-----|--------------------------|-----------------|---------|--------|----------|
|                       | Men            | Women |     |                          |                 | better  | healed | unhealed |
| Neck-shoulder pain    | 1              | -     | 56  | farmer                   | 3               | ✓       |        |          |
| back pain             | -              | 1     | 42  | farmer                   | 2               | ✓       |        |          |
| wrist pain            | -              | 1     | 42  | labor                    | 1               | ✓       |        |          |
| right shoulderpain    | -              | 1     | 54  | government officer       | 2               |         | ✓      |          |
| waist pain            | 1              | -     | 67  | farmer                   | 3               | ✓       |        |          |
| right breast tension  | -              | 1     | 28  | merchant                 | 1               |         | ✓      |          |
| elbow pain            | 1              | -     | 42  | forest product collector | 2               |         | ✓      |          |
| back pain             | 1              | -     | 51  | labor                    | 2               |         | ✓      |          |
| right arm muscle pain | 1              | -     | 54  | forest product collector | 2               |         | ✓      |          |
| right ankle pain      | 1              | -     | 46  | contractor               | 2               |         | ✓      |          |

Patients with muscle and ligament pain syndrome of Mr. Samran included six males and four females who were mostly in old age (9 persons in age of 32-70 years old – risk group: low ability to resist disease) following by middle age (age of 16-32 years old – lower risk group). Most patients did high laborious work (6 persons) following by moderate laborious work (Table 1). According to folk medicine principle, causes of illness relate to gestures of activities (e.g. twisting body to pick things up, carrying or long-term using same organ) and accident (e.g. fall down)

### **Knowledge and knowledge management of four-element relationship for explaining diagnosis of traditional healer for Yam Khang treatment**

Traditional healer's diagnosis process followed folk medicine principle. Mr. Samran Mafu is the best Yam Khang healer of Lanna and diagnoses illness and symptom basing on knowledge of four elements as follows.

#### 1) Basic knowledge of element interaction

The study found that Mr. Samran has the knowledge of four-element interaction. Water element is unstable and has to rely on other elements for movement. Fire and wind element push water back into earth element, so movement of water is affected by wind that comes from fire. Thus, fire is in wind and wind is in water, or fire is in water through wind only. Forms of water element are more than other elements because of high temperature from fire. Low level of water will increase temperature, which hot earth element causes dry earth that reduces stability until it fragments.

On the other hand, excess water introduces water-saturated earth that causes watery and swelling earth. Thus, earth relies on water to remain earth structure through suitable water level. Water supports earth growth and fire/wind in water supports earth drought, so water is necessary for earth and needs fire and wind to move and lubricate earth.

#### 2) Basic knowledge of four-element forms

Forms of four elements are a basic knowledge of Mr. Samran's treatment. 1) Earth element is hard/soft and fine, so it has to cling to other elements to be sensible and visible as seen in body parts, such as hair, nail, tooth, skin, bone, muscle and ligament. 2) Dense covering of water element introduces fluid and movable form, and water element has a duty to connect earth element with others as seen in body parts, such as mucus, pus, blood, sweat, lipid, joint fluid and urine (Mahachulalongkornrajavidyalaya, 1996). 3) Wind element moves all over the body, such as upward wind, downward wind, abdominal wind, intestinal wind and breath. 4) Fire element has hot and cold condition, which gas condition helps object softness (Taoprasert and Taoprasert, 2004).

Forms of elements as mentioned above cause different proportion of element. Mr. Samran said that unequal proportion or different purity of elements always shows different appearance. Properties and characteristics of earth and water elements are clearly different because they have different proportion of purity. Earth element is hard, whereas water element is movable fluid, cold and moist. Thus, both elements have close mutual dependence. Fire and wind element are invisible but rely on each other. For example, heat

power of fire moves wind and controls wind speed because heat is fire property and unstable movement is wind property. Thus, more purity of elements enhances more efficiency.

### 3) Basic knowledge of four-element relationship law

Basic knowledge of Mr. Samran has positive and negative relationship of elements.

1) Positive relationship is normal condition that has mutual support among elements. 2) Negative relationship is to oppress to avoid overworking of organs, such as earth and fire oppress each other, and water and wind oppress each other. Different element weight shows nonsupport. In addition, same element may have conflict causing unbalance of four elements or called over-acting, weakness (underworking) and disability (malfunction or stop working) (Tierney, 2001).

### 4) Basic knowledge of diagnosis according to four-element unbalance

Mr. Samran diagnosed patients with muscle and ligament pain syndrome according to relationship of four unbalanced elements. Pain was diagnosed as relating to weakness of wind element that affected earth-element tension (overworking). Poor blood circulation at pain area referred to abnormal water element (weak). Thus, earth element is tense muscle and ligament causing poor wind and blood flow that create pain. The study found that the most abnormal element of patients with muscle and ligament pain was wind element (Figure 1).

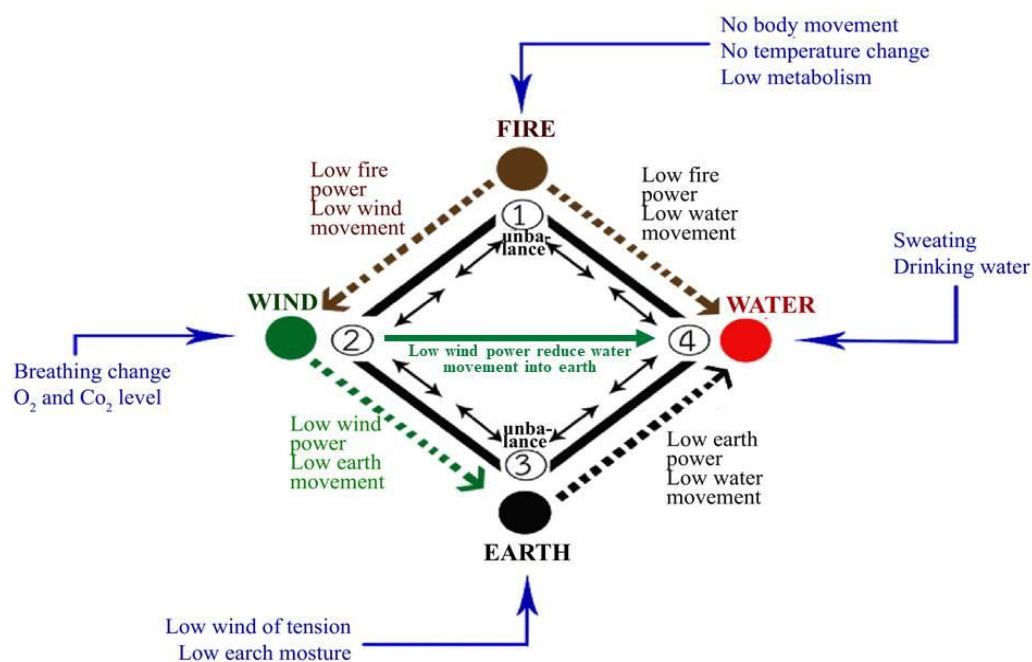


Figure 1: Unbalance of four elements caused muscle and ligament pain



The diagnosis mentioned above can be analyzed that the thinking method and approach compared between oriental and western medicine, which the knowledge was successfully managed by School of Traditional and Alternative Medicine. Description of treatment in main reference book including unbalance and equilibration of four elements for healing muscle and ligament pain is accepted and famous. Because of weak wind, treatment has to move wind by increasing fire in muscle and ligament of patients, which power of fire can transform into wind and heat from fire can help movement of compacted earth. Increase in earth movement and blood vessel widening because of wind and fire power supports water penetration. Thus, Yam Khang treatment helps bringing fire from outside into the body to support low fire power inside and helps increasing earth power at compacted area by using earth element stored in Khang plate, which then it increase power of wind and water leading to balance of four elements and recovery of the muscle and ligament pain symptom.

#### **Knowledge and knowledge management of four-element interaction for explaining Yam Khang treatment with herb to adjust balance of elements**

Treatment process of Mr. Samran according to folk medicine principle used tacit knowledge of four elements as follows.

##### 1) Tacit knowledge of balancing four elements with Khang and Plai

Mr. Samran's treatment used Yam Khang method that is massage with hot foot stepped on burned Khang plate and Plai oil. After diagnosis, he will treat patients by using heel and tip toe to alternately press along abnormal main line and will check their symptoms at the same time. Massage with hot foot will help circulation of unbalanced wind element and enhance blood circulation. Massage according to main line principle and use of hot foot with Plai oil can relieve muscle and ligament pain.

Ten case studies supported knowledge management and synthesis that the abnormality was affected by overworking of earth element and weakness of wind and water elements. According to knowledge of elements of folk medicine, symptoms of ten patients may a result of weak wind element (obstructed wind flow caused slow movement), weak water element (poor blood circulation) and over-working earth element (tense muscle and ligament due to lack of water). According to oriental medicine knowledge, unbalance of weak wind element affects interaction of other elements, which the treatment method includes 1) changing fire power into wind power – overheated fire element has to be cooled down to increase wind power, 2) controlling wind element to support water element – less water movement obstructs wind support causing lack of earth moisture, and 3) aggregating water

element to create earth element – weak water drops its support to earth causing earth tension. Because of element fluctuation, earth will take over water and fire will take over wind. Earth element has to rely on water to maintain its moisture and wind element has to rely on fire to move and raise its power, while water has to rely on wind and fire to raise its power for movement.

Therefore, it can be said that muscle and ligament pain symptom of ten patients was a result of poor blood circulation. Weak wind may be obstructed along wind route, which muscle may pull ligament until causing pain. Hypothesis was that the action of patients affected earth element resulting muscle and ligament pain.

After diagnosing the cause of illness, knowledge inference of treatment method from Mr. Samran’s tacit knowledge was important knowledge that has to be extracted. Weak wind was important cause of muscle and ligament pain. Thus, Mr. Samran treated by increasing fire element from external through heat of hot Khang plate and Plai in order to balance weak elements. This method has been used for a long time, which fire element from hot Khang plate and active compound of Plai was imported into the patient’s body via massage with heel and tip toe to introduce physical response as seen in ten recovered patients in the results of the study (Figure 2).

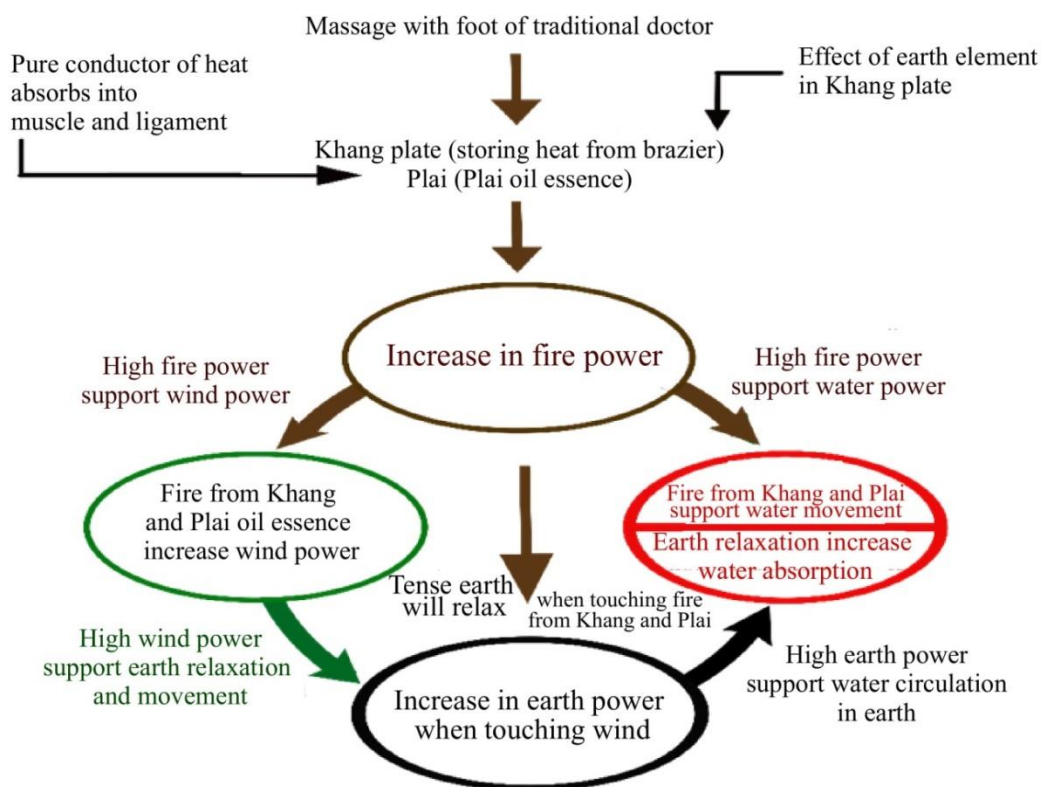


Figure 2: Balancing four elements with Khang and Plai.

2) Knowledge and knowledge management of School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University

School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University assigns profession courses of massage and herbs use for treatment with more than 60 credits, which this is the great standard. Oriental medicine is without fixed experiment but is knowledge from understanding of academics or traditional healers who learn from experience that becomes actual knowledge with similar results but different details because this kind of knowledge is proved and tested by themselves, which the knowledge is accumulated into tacit knowledge from direct experience that is the highest knowledge.

Lanna traditional healers have knowledge of four elements as tacit knowledge but its situation is not in paradigm of recorded works because the knowledge is unstable. Knowledge is managed by traditional healer's practice, which more aggregation of knowledge creates crystalized knowledge. Tacit knowledge is not written because knowledge verification does not come from experiment likes western medicine.

School of Traditional and Alternative Medicine is a mediator who records knowledge of Lanna traditional healers by comparing mindset of western medicine with tacit knowledge of oriental medicine for clear communication. Yam Khang is knowledge from truth and tacit knowledge of traditional healers. The selected Lanna traditional healer or Mr. Samran has practiced and tried treatment method until he can successfully cure muscle and ligament pain syndrome, but details of the knowledge has never been recorded. Therefore, the knowledge of Mr. Samran was firstly recorded in the study.

## Discussion

In-depth studies on knowledge and knowledge management of specific disease have not yet been studied to show in-depth information on final result of knowledge until this study firstly brought out tacit knowledge and aimed to create and expand the knowledge to be explicit knowledge.

### **Relationship between symptoms and causes/factors of illness**

Ten patients with muscle and ligament pain who were treated by Mr. Samran's Yam Khang treatment were in old age (32-70 years old) that is easy to face over-working wind. Factor of occupation also related to illness, which most of patient's occupations had overuse muscle and repetitive motion. Most patients felt pain in arm, leg and back (following by neck-shoulder pain) that are in the path of Galtaree and Ita-Pingkla lines, so the lines were main cause of muscle and ligament pain conforming with study of Taoprasert and Taoprasert (2004)

that mentioned belief and explanation of illness in physiotherapist chapter in textbook of Lanna folk medicine.

### **Diagnosis and treatment for muscle and ligament pain according to folk medicine theory**

The study did not find the previous documents on four-element interaction caused unbalance and treatment for equilibration. Thus, the study was deep in the knowledge and found that Mr. Samran's diagnosis followed folk medicine principle on basic knowledge of four-element unbalance, specific knowledge of causes of illness and tacit knowledge of using Khang and Plai for treatment. Mr. Samran diagnosed that illness was a result of weak wind because of hard working and incorrect posture and weak water because of age, which earth without water support will overworking (tense) causing pain. Therefore, treatment has to add fire element from Khang and Plai because fire in the body will support weak wind. Import of external fire will adjust balance of four elements.

### **Treatment result of ten patients**

Yam Khang treatment of Mr. Samran can completely cure ten patients with muscle and ligament pain within three treatment times, which the study is the first record of achievement of Yam Khang treatment.

### **Comparison on Yam Khang between eastern and western epistemology**

Using western knowledge for interpreting eastern knowledge through traditional healer's action is a challenge on clear concrete result. Thus, course of traditional and alternative medicine by Chiang Rai Rajabhat University aimed to use western and eastern knowledge to clarify knowledge of traditional healer that relied on accumulation of long-term experience and trial and error to develop specific knowledge and consequently tacit knowledge. Traditional healer used knowledge of herbs as a part of thinking method to analyze together with using equipment of Yam Khang treatment. Although the knowledge of traditional healer did not base on scientific principle that relies on provable truth, new generation can understand and accept traditional healer's knowledge of treatment.

However, the knowledge was attached to traditional healer, so eastern knowledge of folk medicine had to be used for communication through a mediator likes School of Traditional and Alternative Medicine that created process on managing traditional healer's knowledge from direct experience of each Lanna traditional healer in order to create main textbook for benefits of both traditional healers and community.

The previous studies on tacit knowledge stated application for thinking method for treatment without recording. Yoadsomsuay and Wongtongtair (2009) studied on traditional healer at Amphoe Ongkharak, Changwat Nakhon Nayok, and said that traditional healers had specific knowledge and tacit knowledge and passed on by word of mouth without systematic record. Thus, tacit knowledge was disappeared together with traditional healers. In addition, the study of Chiaranai (2012) on wisdom of Thai traditional medicine, Thai traditional midwifery and use of herbs of traditional healers around Namphung Dam, Sakon Nakhon mentioned importance of developing knowledge because acquisition of herbal knowledge is limited by tales of experts without recording and systematic transfer, so knowledge of herbs might disappear.

The study of Homhual (2016) on knowledge management for self-healthcare at Ban Chaba, Muang Tak, Tak and the study of Pimpisut (2018) on role of traditional healer on self-reliance at Tumbol Dong Mada, Changwat Chiang Rai were similar in term of that community collected knowledge of local wisdom and supported youth learning process via courses of local wisdom and activities about local use of herbs to enhance systematic inheritance and preserve the knowledge. Movement of traditional healers and partners who had tacit knowledge and experience on community interaction was to create self-healthcare that conforms to vision of School of Traditional and Alternative Medicine under direction of Asst. Prof. Yingyong Taoprasert who initiated course of folk medicine by combining western and eastern knowledge, which the course has been successful until now.

## Conclusion

The study found that knowledge and knowledge management of Mr. Samran's diagnosis and treatment came from basic knowledge toward tacit knowledge. Knowledge of treatment method for muscle and ligament pain syndrome of traditional healer should be transferred through additional explanation of western epistemology by School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University, which it will enhance success of knowledge transfer. The knowledge can be concluded as follows.

### **Knowledge of eastern epistemology**

Traditional healer's knowledge for Yam Khang treatment came from basic knowledge that illness is a result of four-element unbalance. Knowledge creation process included trial and error through experience till becoming specific knowledge, such as four-element interaction, internal and external causes of illness. The knowledge led to tacit knowledge and was transferred to explicit knowledge in other people, such as fire element in Plai, fire

element from Khang plate. Properties of two fire materials were combined for treating muscle and ligament pain syndrome by adjusting unbalance of four elements. Mr. Samran managed the knowledge by classifying knowledge of Yam Khang equipment, analyzing, synthesizing and using the knowledge until he knew a method of using heat from Khang plate and active compound from Plai to balance four elements following symptoms.

#### **Knowledge of western epistemology**

Explanation following international scientific principle that presents tangible and measurable truth was distributed through main textbook to confirm empirical knowledge by School of Traditional and Alternative Medicine, Chiang Rai Rajabhat University.

#### **Explaining knowledge of academics and traditional healer and expanding the results**

Explanation based on integration of western and oriental knowledge. Traditional healer explained knowledge through intangible reasons that was inconstant system for clear explanation. Tacit knowledge that was crystalized from Mr. Samran's experience on Yam Khang treatment was not written likes a secret although he has in-depth knowledge and mastery.

#### **Suggestions**

1) Treatment result from using heat from Khang plate and Plai's active ingredient for each patient should be promoted to help building reliability of successful treatment result through certified result of ten patients from case study that was actually successful.

2) Treatment result that showed analysis according to element theory may benefit further in-depth study on treatment success based on the study as well as further study on treatment limitation and scope of each symptom group of patients.

#### **Limitation**

1) For tacit knowledge, traditional healer did not trust and needed to keep the knowledge as secret until death, which was the obstacle of in-depth data collection. However, the study used scientific knowledge to support explanation. Although some aspects of data were not clearly compared, scientific data can explain reasonably, be understood and be interpreted easily.

2) Case study of ten patients should be recorded in another knowledge set. Empirical data will confirm that the results on using Yam Khang equipment (including basic knowledge, specific knowledge, tacit knowledge, knowledge of specific equipment and knowledge of equipment application) is truly accepted and distributed. The knowledge will be unreliable if it is not recorded.

3) Treatment result of each patient may be different, which it may reduce reliability of the treatment that should make full recovery. However, the overview of treatment showed that the knowledge gave a good result for all ten patients.

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