The Effects of a Mindfulness-Based Nursing Rehabilitation Program on Physical Functioning Psychological Distress and Spiritual Well-Being of Thai Buddhist Patients with Lower Extremity Injury

Chidchanok Mayurapak

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Nursing (International Program)

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Author	Miss Chidchanok Mayurapak
Major Program	Nursing (International Program)

Major Advisor	**Examining Committee:**
..……...……	……...……...…Chairperson
(Assoc. Prof. Dr. Praneed Songwathana)	(Assoc. Prof. Dr. Aranya Chaowalit)
	...……...…….....Committee
Co-advisor	(Assoc. Prof. Dr. Praneed Songwathana)
……..	..…….....Committee
(Asst. Prof. Dr. Wongchan Petpichetchian)	(Asst. Prof. Dr. Wongchan Petpichetchian)
	……...…….....Committee
	(Assoc. Prof. Dr. Urai Hatthakit)
	……...…….....Committee
	(Assoc. Prof. Dr. Sureeporn Thanasilp)

The Graduate School, Prince of Songkla University, has approved this thesis as partial fulfillment of the requirements for the Doctor of Philosophy Degree in Nursing (International Program).

……
(Assoc. Prof. Dr. Teerapol Srichana)
Dean of Graduate School

This is to certify that the work here submitted is the result of the candidate's own investigations. Due acknowledgement has been made of any assistance received.

…...……..Signature
(Assoc. Prof. Dr. Praneed Songwathana)
Major Advisor

……...……...…Signature
(Miss Chidchanok Mayurapak)
Candidate

I hereby certify that this work has not been accepted in substance for any other degree, and is not being currently submitted in candidature for any degree.

……..……Signature

(Miss Chidchanok Mayurapak)

Candidate

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ABSTRACT

The purpose of this study was to evaluate the effects of a mindfulness-based nursing rehabilitation program (MNRP) on physical functioning, psychological distress, and spiritual well-being of Thai Buddhist with lower extremity injury. The program was developed based on Buddhist philosophy and Roy's Adaptation Model by integration of Luangpor Teean's awareness-mindfulness meditation and a home-based rehabilitation. Thirty-four eligible participants admitted in a tertiary care hospital were randomly assigned to either the experimental group (n=17) or the control group (n=17). The experimental group received MNRP while the control group received routine care. Three main outcomes were evaluated at 1 month and 3 months after injury and included 1) physical functioning assessed by muscle strength (MS) and passive range of motion (PROM) of hip and knee joint, 2) psychological distress by brief symptom inventory-18 (BSI-18) and 3) spiritual well-being by spirituality index well-being (SIWB). Data were analyzed using Profile analysis, repeated measures Friedman test, Wilcoxon signed-rank test, and Mann Whitney U test to evaluate the effects of the MNRP.

The results showed that the experimental group had significantly higher physical functioning and spiritual well-being; and lower psychological distress across time at 1 and 3 months from baseline. Moreover, the experimental group had higher physical functioning (both muscle strength and PROM of knee flexion), higher spiritual well-being; and lower psychological distress at all-time points compared to the control group.

The MNRP is easy to follow and appropriate for patients to practice. It is suggested that the MNRP can be one strategy to apply by integrating it into the routine care for orthopedic patients in order to improve physical functioning and spiritual well-being and reduce psychological distress. However, a larger sample size and more diverse group of participants is recommended in future research.

ชื่อวิทยานิพนธ์ ผลของการใช้โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติต่อความสามารถในการทำหน้าที่ของร่างกาย ภาวะบีบคั้นทางจิตใจ และความผาสุกทางจิตวิญญาณในผู้ป่วยไทยพุทธที่กระดูกรยางค์ล่างบาดเจ็บ

ผู้เขียน นางสาวชิดชนก มยูรภักดิ์

สาขาวิชา การพยาบาล (หลักสูตรนานาชาติ)

ปีการศึกษา 2559

บทคัดย่อ

การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อประเมินผลของการใช้โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติต่อความสามารถในการทำหน้าที่ของร่างกาย ภาวะบีบคั้นทางจิตใจ และความผาสุกทางจิตวิญญาณในผู้ป่วยไทยพุทธที่กระดูกรยางค์ล่างบาดเจ็บ กรอบแนวคิดในการศึกษาครั้งนี้คือ พุทธปรัชญาและทฤษฎีการปรับตัวของรอย เนื้อหาของโปรแกรมได้นำการเจริญสติแบบเคลื่อนไหวของหลวงพ่อเทียนมาบูรณาการร่วมกับโปรแกรมการฟื้นฟูสมรรถภาพที่บ้าน กลุ่มตัวอย่างจำนวน 34 รายคัดเลือกตามเกณฑ์ที่กำหนดจากโรงพยาบาลตติยภูมิแห่งหนึ่ง และถูกสุ่มเข้ากลุ่ม ทดลองจำนวน 17 คน และกลุ่มควบคุมจำนวน 17 คน เครื่องมือที่ใช้การประเมินประกอบด้วย (1) ความสามารถในการทำหน้าที่ของร่างกาย ได้แก่ การประเมินความแข็งแรงของกล้ามเนื้อและการประเมินพิสัยการเคลื่อนไหวของข้อสะโพกและข้อเข่า (2) ภาวะบีบคั้นทางจิตใจ ใช้แบบประเมินภาวะบีบคั้นทางจิตใจ และ (3) ความผาสุกทางจิตวิญญาณใช้ดัชนีสุขภาวะทางจิตปัญญา วิเคราะห์ข้อมูลโดยใช้สถิติเชิงอนุมานได้แก่ การวิเคราะห์โปรไฟล์, สถิติทดสอบฟรีดแมน, การทดสอบวิลคอกซันและสถิติแมนวิทเนย์ เพื่อประเมินผลของการใช้โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติ

ผลการวิจัยพบว่า กลุ่มทดลองมีความสามารถในการทำหน้าที่ของร่างกายมากขึ้น

มีภาวะบีบคั้นทางจิตใจลดลง และมีความผาสุกทางจิตวิญญาณมากขึ้น เมื่อเวลาผ่านไป 1 เดือนและ 3 เดือนหลังการบาดเจ็บ เปรียบเทียบกับก่อนเข้าร่วมโปรแกรม และเมื่อเปรียบเทียบกับกลุ่มควบคุม พบว่า กลุ่มทดลองมีความสามารถในการทำหน้าที่ของร่างกาย (เฉพาะความแข็งแรงของกล้ามเนื้อและพิสัยการเคลื่อนไหวของการงอข้อเข่า) ความผาสุกทางจิตวิญญาณเพิ่มขึ้น และภาวะบีบคั้นทางจิตใจลดลง

โปรแกรมนี้มีความง่ายและเหมาะสมต่อผู้ป่วยในการปฏิบัติ ผู้วิจัยจึงให้ข้อเสนอแนะว่า ควรนำโปรแกรมนี้ไปบูรณาการร่วมกับการดูแลทั่วไป ซึ่งจะเป็นอีกหนึ่งวิธีการที่ช่วยเพิ่มความสามารถในการทำหน้าที่ของร่างกายและความผาสุกทางจิตวิญญาณ รวมถึงลดภาวะการบีบคั้นด้านจิตใจของผู้ป่วยที่มีการบาดเจ็บกระดูก และในการวิจัยครั้งต่อไป ควรเพิ่มจำนวนและความหลากหลายของกลุ่มตัวอย่าง

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Chidchanok Mayurapak

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Worldwide, Thailand is second highest in terms of road traffic accident (RTA) mortalities. The total number of deaths has been calculated at approximately 36.2 deaths per 100,000 people per year. Eighty-three percent of road traffic fatalities involve cyclists and pedestrians, particularly motorcyclists who are highly vulnerable road users at 73% (WHO, 2017). RTAs are the leading cause of death and cause of Disability Adjust Life Years (DALYs) among Thais aged between 15 and 49 years who are in the economically productive group (WHO, 2016). The Royal Thai Police (2013) has shown that human error causes the majority of RTAs, including exceeding the speed limit, dangerous lane changing, driving too close to a leading vehicle and drunk driving. In the upper southern region of Thailand between 2007 and 2011, Surat Thani Province had the highest number of road traffic accidents, while the highest number of road traffic accidents between 2012 and 2015 changed to Nakhon Si Thammarat Province. The current data have shown that the total numbers of accidents were increased and most of these were caused by motorcyclists (Royal Thai Police, 2016). Hence, the RTAs in Nakhon Si Thammarat Province remain a crisis to which healthcare providers and stakeholders should give top priority.

According to road traffic accident statistics, head, chest and abdominal injury are more severe while the incidence of musculoskeletal injury is more common (Hanna & Austin, 2008; Martin & Laumon, 2011). Although the consequences of

musculoskeletal injury may not be life-threatening, this injury destroys health and lives in addition to changing the lifestyles of victims and their families. Patients with orthopedic trauma are more impaired in physical functioning at 6 months and 12 months than patients with non-orthopedic injuries as they are confronted with post-injury physical impairment. The extent of physical impairment has impact on physical, psychological, spiritual and social problems such as pain, psychological distress, limited function, residual disability and delayed return to work (Bhandari, Busse, Hanson, Leece, Ayeni & Schemitsch, 2008; Crichlow, Andres, Morrison, Haley, Vrahas, 2006; Michaels, Michaels, Smith, Moon, Peterson, & Long, 2000; Ponzer, Molin, Johansson, Bergman & Tornkvist, 2000; Vincent, Horodyski, Vincent, Brisbane, & Sadasivan, 2015).

Lower extremity organs are the most frequently injured organs in the musculoskeletal system (Martin & Laumon, 2011). The lower extremities are classified into the following eight different regions: the foot, ankle, leg, knee, thigh, hip, and pelvis region (Hanna & Austin, 2008). The most common mechanism of injury is high energy trauma such as in motor vehicle accidents. The mechanisms of injury affect the bone healing process. Literature has shown that more open fractures due to high-energy trauma lead to soft tissue damage and delayed bone healing processes than closed fractures (Giannoudis, Papakostidis & Roberts, 2006; Miller & Askew, 2007). Delayed bone healing processes lead to extended physical impairment, limited organ function, residual disability and eventual delayed return to work or routine activities (Clay, Newstead & McClure, 2010; Sutherland, Suttie, Alexander & Hutchison, 2011). Therefore, healthcare providers should recognize and provide

suitable care for patients with lower extremity injury to promote bone healing and adaptive processes.

Lower extremity injury due to a road traffic accident frequently means sudden injury and unplanned hospitalization. Patients may be confronted with changes in physical conditions after fractures, and they need to adapt to changing roles (Maselesele & Idemudia, 2013). Furthermore, orthopedic surgery and other necessary treatments often induce pain, fear and anxiety. As a result of the emergency situation, lack of preparations and unplanned hospitalization results in a psychological reaction especially a sense of separation from loved ones (Khunphadung, 2005) who are difficult to accept. Physically changed conditions may have both negative and unacceptable effects on physical image. Patients with lower extremity injury are afraid of pain, organ loss and death. Immobilization due to injury and treatments leads to a need for help and support from other persons (Ponsford, Karamitsios & Bahar-Fuchs, 2008; Vincent et al, 2015). The above mentioned circumstances lead patients to suffer a high degree of psychological distress.

Psychological distress is caused by negative feelings and thoughts regarding traumatic experiences and future life (Tutton, Seers & Langstaff, 2012). Some patients have perceived inability to cope with their problems (Ridner, 2004). They feel their lives are uncertain, unworthy, hopeless and powerless. They are inert to the activities of daily living (ADL) and physical therapy; as a consequence, delayed bone healing processes occur. Previous studies have shown that psychological distress following physical traumatic injury affects short-term and long-term outcomes, especially concerning physical impairment and disability (Fergusun, Brand, Lowe, Gabbe, Dowrick, Hart & Richardson, 2008; Vincent, et al., 2015). For

instance, Richmond et al. (2003) found post-traumatic psychological distress during hospitalization may affect post-traumatic psychological distress and disability which occurs in three months after injury and continue affects on disabilities in 2.5 years later. Simultaneously, residual disability and delayed return to usual activities will lead patient to presenting more psychological distress symptoms as a vicious cycle.

According to the International Classification of Functioning, Disability and Health (ICF), the aftermath of lower extremity injury may affect impairment, activity limitation and participation restriction (Kearney & Pryor, 2004). Several studies have shown that functional outcomes following lower extremity injuries were poor and functional limitations to have the effect of decreased physical activities with restricted participation (Bhandari et al., 2008; Burger, 2012; Ponsford, et al., 2008). Hence, the significance of functional outcome should be considered.

To achieve the optimal outcome, treatments for lower extremity injury require not only complete immobilization and surgery, but also time for bone healing in the rehabilitation process such as physical therapy for preventing post-injury physical impairment. Much literature has found physical impairment to be the best predictor of return to work following physical injury (Richmond et al, 2003). Thus, the rehabilitation process is important in helping patients rapidly recover from injuries and return to normal work and social activities. However, Weigl et al. (2007) showed psychological distress during rehabilitation to have a negative impact on the recovery process. Therefore, effective interventions to reduce psychological distress during rehabilitation should be implemented for patients with lower extremity injury in order to improve physical function. Finally, patients with lower extremity injuries will be able to return normal activity within an appropriate period of time.

Due to physical impairment and psychological distress following injuries, the care of patients with lower extremity injury requires a multidisciplinary approach and care management by nurses for who coordinate and facilitate (Heist, 2002). Under current conditions, most hospitals are concerned with shorter hospital stays in relation to cost-effectiveness issues. Due to the short period of treatment, some patients are not fully prepared to subsist in new situations (Purivatanakul, Tipmongkol & Wongleang, 2007). Similarly, patients with lower extremity injuries have to walk with crutches and manage their lives, depending on help and support from other people. Stressful situations lead to psychological distress during the rehabilitation phase and may interrupt the process of bone healing. Finally, extended physical impairment will occur. Therefore, an effective intervention to reduce psychological distress during rehabilitation and improve physical functioning following lower extremity injury is necessary.

According to Roy's Adaptation Model, a good adaptive process Requires both regulator and cognator in coping mechanism which have an effect on four adaptive modes consisting of physiologic, self-concept, role function and interdependence modes (Roy, 2009). To assist patient with lower extremity injury in human integrity to comply a treatment and rehabilitation by themselves, it acquires cognator skills to enhance coping mechanism particularly in physiologic and self-concept modes.

Based on the literature review, mindfulness-based interventions have been provided for reducing psychological distress associated with medical and psychiatric problems (Kabat-Zinn, 2003). The intervention develops present-centered awareness and acceptance in order to control negative thoughts and emotions (Baer,

2003; Bishop et al 2004; Kabat-Zinn, 2003). Several randomized controlled studies have shown mindfulness-based interventions to be superior to other interventions in reducing psychological symptoms and emotional disturbance, as well as improving behavioral regulation (Jaint, Shapiro, Swanick, Roesch, Mills, Bell et al., 2007; Keng, Smoski & Robins, 2011; Ostafin, Chawla, Bowen, Dillworth, Witkiewitz & Marlatt, 2006). Furthermore, in terms of rehabilitation, mindfulness can improve the process of motor learning. Patients with lower extremity injury use the process of motor learning to learn new movements such as re-learning how to walk with crutches or walkers, how to stand or how to sit up. Motor learning consists of the following three stages: cognitive, associative and autonomous stages. Completing the cognitive stage from these three stages is difficult because patients are more focused on "what to do" than "how to do". Although the learners try to practice carefully, the performance at this stage has shown a large number of errors (Magill, 2011). To pass this stage, a combination of mindfulness techniques needs to be used particularly in those who need to comply with the rehabilitation in long term.

The facets of mindfulness consist of observing, describing, acting with awareness, non-judging about inner experience and non-reactivity to inner experience. Acting with awareness helps persons attend to current actions. As a result, errors of practice can be reduced. Hence, the learner can pass through the next stage of motor learning. Therefore, mindfulness can significantly improve the process of motor learning which leads to permanent improvement in motor function. As a consequence, bone healing processes are promoted (Kee & Liu, 2011). Therefore, the addition of mindfulness to a regular course of physical therapy may be more effective in terms of

reduced psychological distress and improved functional outcome than physical therapy alone.

According to previous studies of mindfulness programs, potential biases have been detected such as small sample sizes, incomplete outcome data and absence of intention-to-treat analyses, all of which should be matters of concern. In the present study, therefore, the researcher attempted to control several limitations of previous research in order to conduct a well-controlled study. Although mindfulness-based interventions have been employed in various groups of patients, little is known regarding the effects of mindfulness in patients with physical traumatic injury, particularly those with lower extremity injury. Moreover, the integration between mindfulness and rehabilitation is seldom examined.

The Luangpor Teean's awareness-mindfulness meditation is chosen to be integrated with rehabilitation programs because it is easy and can be practiced in daily life. Patients must be aware of movements in every position such as standing, walking, sitting, lying down and moving (Thaiyanond, 2010). In this study, Luangpor Teean's awareness-mindfulness meditation was integrated with a rehabilitation program in order to reduce psychological distress, promote spiritual well-being and improve physical functioning following lower extremity injury. In addition, a prospective randomized controlled trial study was designed to determine the effects of the intervention.

Research Objective

The main purpose of the study was to evaluate the effects of a mindfulness-based nursing rehabilitation program (MNRP) on the physical functioning, psychological distress and spiritual well-being of Thai Buddhist patients with lower extremity injury in the experimental group compared to those in the control group.

Research Questions

The research questions are as follows:

1. Does the mean score for the physical functioning of Thai Buddhist patients with lower extremity injuries who received MNRP differ from baseline to 1 and 3 months after injury?
2. Does the mean score for the physical functioning of Thai Buddhist patients with lower extremity injuries who received MNRP differ from those who receive routine care at 1 and 3 months after injury?
3. Does the mean score for the psychological distress of Thai Buddhist patients with lower extremity injuries who received MNRP differ from baseline to 1 and 3 months after injury?
4. Does the mean score for the psychological distress of Thai Buddhist patients with lower extremity injuries who received MNRP differ from that of those who receive routine care at 1 and 3 months after injury?
5. Does the mean score for the spiritual well-being of Thai Buddhist

patients with lower extremity injuries who received MNRP differ from baseline to 1 and 3 months after injury?

6. Does the mean score for the spiritual well-being of Thai Buddhist patients with lower extremity injuries who received MNRP differ from that of those who receive routine care at 1 and 3 months after injury?

Conceptual Framework

The conceptual framework of this study was built upon Buddhist Philosophy and Roy's Adaptation Model (Roy, 2009).

According to Buddhist philosophy, the heart of the Buddha's teachings is the Four Noble Truths including suffering, cause of suffering, cessation of suffering and the path for maintaining the mind in a state of no-suffering. Lower extremity injury is defined as a cause of suffering. Lower extremity injury is also a cause of physical impairment and psycho-spiritual disturbance leading to suffering.

In terms of Roy's Adaptation Model, lower extremity injury is defined as focal stimuli affecting coping mechanisms and adaptation. Coping mechanisms consists of regular and cognator sub-systems. The regulator sub-system is an adaptive response process that functions automatically, responding through neural, chemical and endocrine factors affecting fluid electrolyte and acid-base balance as well as the endocrine system. The cognator sub-system responds through the following four cognitive-emotional channels: (1) perceptual and information processing; (2) learning; (3) judgment and (4) emotion. Two sub-systems have an effect on four adaptive modes consisting of physiological, self-concept, role function and

interdependence modes. Roy categorizes adaptation into three levels, namely, the integrated, compensatory and compromised levels. When integrated and compensatory levels are inadequate, compromised adaptation is diagnosed. As a result, an adaptation problem occurs in addition to suffering. Two sub-systems work together to promote human system integrity; it is noticeable that these two sub-systems function as the path and integrity of the human system that seems to result in the cessation of suffering according to the four noble truths of Buddha's teachings.

Lower extremity injury is a cause of physical impairment, psycho-spiritual disturbance and interrupted social functioning. Changed structures and functions due to lower extremity injury have an effect on coping mechanisms and four adaptive modes. Due to time constraints in this study, the researcher focused only on the physiological and self-concept modes. The changes in lower extremity structure and function result in compromised levels of the physiological mode, especially concerning activities and rest. Changed structures and functions of the lower extremities lead to negative and unacceptable physical image. Unacceptable changes lead to dissatisfaction, anger and hateful feelings in people's minds. As a consequence, suffering and compromised processes of the self-concept mode occur.

A mindfulness-based nursing rehabilitation program (MNRP) was developed based on knowledge of the cognator sub-system and mindfulness as the path of the Nobel Truths. The MNRP consists of two components including somatic and psycho-spiritual components. Somatic components focus on rehabilitation programs. Psycho-spiritual components focus on Luangpor Teean's awareness-mindfulness meditation, including mindfulness of the body, feeling, mind and mental phenomena. The rehabilitation program was promoted by the cognitive-emotional

channels of the cognator sub-system and Luangpor Teean's awareness-mindfulness meditation. Perceptual and informational processing and learning help patients re-learn activities and movement after injury. Luangpor Teean's awareness-mindfulness meditation can promote the process of motor learning in rehabilitation. Motor learning principles are applied to motor recovery after injury and training leads to permanent improvement in motor function. Finally, physical functioning is improved. At the same time, mindfulness can re-engage and calm the amygdala. As the amygdala calms down, stressful implicit memories lose strength and adaptive memories are laid down through neural connections. As a result, perceptual and information processing, learning, judgment and emotion are improved. Thus, the cognator sub-system is encouraged and the adaptive mode is strengthened. It is evident that Luangpor Teean's awareness-mindfulness meditation has effects on the cognitive-emotional channels of the cognator sub-system and motor learning processes. Therefore, the MNRP can improve physical functioning, reduce psychological distress and promote spiritual well-being with Luangpor Teean's awareness-mindfulness meditation.

The current study allows only those variables related to Roy's physiological and self-concept modes. The variable related to the physiological mode is physical functioning. This was measured by range of motion of hip and knee joints as well as muscle strength. The variables related to self-concept mode are psychological distress and spiritual well-being. The above mentioned was measured by the Brief Symptom Inventory-18 (BSI-18) and Spirituality Index of Well-being (SIWB). The summarized conceptual framework is represented in Figure 1.

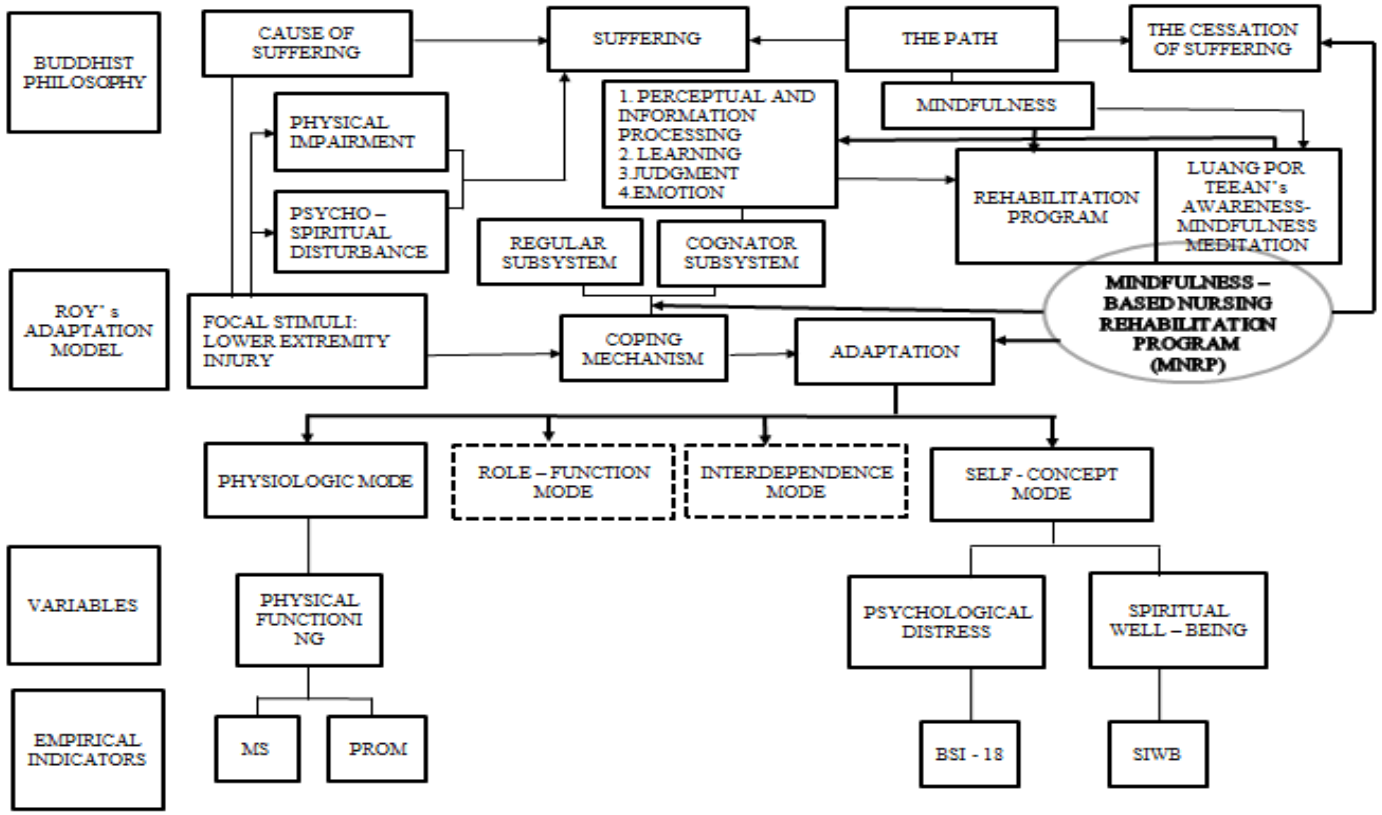

Figure 1 - Conceptual Framework of the Study and Empirical Indicators

Note: BSI-18 = Brief Symptom Inventory-18, SIWB = Spirituality Index of Well-being, PROM = Passive Range of Motion, MS = Muscle Strength

Hypotheses

The hypotheses of the study are as follows:

1. The mean score of physical functioning at 1 and 3 months after injury in the experimental group would be higher than baseline.
2. The mean score for of physical functioning of the experimental Group would be higher than that of the control group at 1 and 3 months after injury.
3. The median score of psychological distress at 1 and 3 months after injury in the experimental group would be lower than baseline.
4. The median score of psychological distress in the experimental Group would be lower than that of the control group at 1 and 3 months after injury.
5. The median score of spiritual well-being at 1 and 3 months after injury in the experimental group would be higher than baseline.
6. The median score of spiritual well-being in the experimental group would be higher than that of the control group at 1 and 3 months after injury.

Definition of Terms

Mindfulness- based Nursing Rehabilitation Program (MNRP)

The Mindfulness-based Nursing Rehabilitation Program (MNRP) is an intervention developed based upon Buddhist philosophy and Roy's Adaptation Model by acquiring both the somatic and psycho-spiritual components. Somatic components focused on knowledge about fractures, bone healing processes, rehabilitation programs and time of recovery. With this component, the perceptual and information processing and learning of the cognator sub-system were used to improve patient's ability to cope for improvement of physical functioning. According to psycho-spiritual components, Luangpor Teean's awareness-mindfulness meditation was applied to encourage judgment and emotion of the cognator sub-system through the limbic system, which reduces psychological distress and promotes spiritual well-being. At the same time, Luangpor Teean's awareness-mindfulness meditation has an effect on motor learning processes which also improves physical functioning.

The MNRP consisted of three parts. Part 1 giving information and knowledge about fractures, bone healing process and time of recovery. Part 2 offering Luangpor Teean's awareness-mindfulness meditation in a DVD. Part 3 integrating Luangpor Teean's awareness-mindfulness meditation and a home-based rehabilitation program. Parts 1 and 2 were implemented on the third post-injury day at the hospital by the researcher. Three to five days post-operation, the vacuum drain was removed and participants were transferred to the Department of Physical Therapy for training in a home-based rehabilitation program. Part 3 was implemented and continued until discharge from the hospital. The participants were contacted by telephone in order to

ensure patients' practice at home and the barriers were evaluated at the first week post discharge.

Routine Care

Routine care is the regular health-related instructions and home Rehabilitation program at the hospital provided by nurses and physiotherapists, including ambulation with assistive devices (crutches, walkers), home medication, nutrients for promoting bone healing processes and time to follow-up.

Physical Functioning

Physical functioning is the ability of an organ or other part of the body to perform or coordinate specific activities of daily living (ADL). In a lower extremity injury, muscle strength is an important marker in accessing factor affecting physical functioning and range of motion is a significant predictor of physical functioning. Muscle strength refers to a mean of testing and grading of quadriceps muscle strength based on gravity and manually applied resistance (O' Dell, Lin, Singh, & Christolias, 2016). Range of motion refers to passive range of motion of hip flexion, hip extension, and knee flexion (White, 2014). Therefore, range of motion and muscle strength are both considered empirical indicators.

Psychological Distress

Psychological distress is a state of negative emotion following stressful life events with impact on maladaptive physical, psychological, spiritual functioning. Psychological distress can be manifested as sadness, depression, anxiety or dissatisfaction of life which affects level of functioning. The presence of psychological distress was assessed by the Brief Symptom Inventory-18 (BSI-18) developed by Derogatis (2000) as an empirical indicator.

Spiritual Well-being

Spiritual well-being is a positive state of the integral part of mental, emotional and physical health in which a person shows feelings of happiness, understanding of self, managing interpersonal relationships and having internal energy in order to promote the journey of recovery and healing in holistic health. In this study, the Spirituality Index of Well-being (SIWB) which is self-report questionnaire developed by Daaleman and Frey (2004) was used as an empirical indicator.

Scope of the Study

The purpose of this study was to evaluate the effects of the Mindfulness-based Nursing Rehabilitation Program (MNRP) among Thai Buddhist patients with lower extremity injury in Nakhon Si Thammarat Province, Thailand.

This program was conducted in the Orthopedic Ward, Maharaj Nakhon Si Thammarat Hospital. In the intervention phase, the control group received routine care only from the nurses and physiotherapists, whereas the experimental group received the MNRP implemented by the researcher on the third post-injury day. In the data collection phase, the research assistant was trained for data collection by the researcher. Data were collected at three time points, namely, before the intervention as baseline, one-month follow-up and three-month follow-up.

Significance of the Study

The MNRP developed in this study is crucial to the improvement of nursing practice and research. For nursing practice, the program can be a guideline for nurses and multidisciplinary teams in providing care and managing patients with lower extremity injury. The MNRP leads to improvement of quality of care, particularly improving physical functioning, reducing psychological distress and promoting spiritual well-being after lower extremity injury. Trauma nurses and related healthcare providers can adopt the MNRP for encouraging patients in ability to perform continuing rehabilitation at home. For nursing research, a study integrates mindfulness meditation in a rehabilitation programs, would contribute a new knowledge regarding interventions following lower extremity injury. The findings can be used as a fundamental to validating mindfulness-based nursing rehabilitation based on Roy's adaptation model.

CHAPTER 2

LITERATURE REVIEW

In order to study the effects of the mindfulness-based nursing rehabilitation program (MNRP) on the physical functioning, psychological distress and social functioning of Thai Buddhist with lower extremity injury, the literature review were conducted in relation to the major concepts of the study. The sequence of presentation is as follows:

1. Buddhist Philosophy
2. Roy's Adaptation Model
3. Adaptation of Thai Buddhists with lower extremity injury: Through the Lens of Roy's Adaptation Model
4. Physical Functioning
5. Psychological Distress
6. Spiritual Well-being
7. Mindfulness
8. Rehabilitation
9. Summary of the literature review

Buddhist Philosophy

According to Buddhist philosophy, the heart of the Buddha's teachings is the Four Noble Truths, namely, suffering, cause of suffering, cessation of suffering and the path for maintaining the mind in a state of no-suffering.

The First Noble Truths are known as *the noble truths of suffering (Dukkha).* There are three patterns of suffering. First, the Dukkha of ordinary suffering (Dukkha-dukkha) is obvious physical suffering associated with giving birth, growing old, physical illness and the process of dying. Second, the Dukkhais is produced by change (Viparinama-dukkha) occurring as a result of stress from attempting to hold onto things that are constantly changing. Third is the Dukkha of conditioned states (Samkhara-dukkha) with dissatisfaction pervading all forms of life because all forms of life are impermanent and dynamic. The Dukkha of conditioned states is the most important aspect of the First Noble Truth. According to Buddhist philosophy, life is only a combination of physical and mental forces that can be divided into five aggregates, namely, form (*Rupa*), sensation (*Vedana*), perception (*Sanna*), conception (*Sankhara*) and consciousness (*Vinnana*). The Buddha taught that five aggregates are impermanent and non-self. They have changed overtime. Therefore, attachment to the five aggregates leads to suffering.

The second Noble Truth is known as *the cause of suffering (Sumudaya).*This suffering is caused by desire, attachment and defilement. According to the five aggregates, form (*Rupa*) consists of four elements: solid, water, fire and air. Form

is connected to other parts through sense bases (*Ayatana or Saḷāyatana*) which are classified into two types: an internal sense base and an external sense base. The internal sense base, or the organ base, consists of the eyes, ears, nose, tongue, body and objects and mind while the external sense base, or the sense object, includes form, sound, smell, taste, tangible objects and mental objects (memory or thought). Thus, there are six internal-external (organ-object) pairs of the sense bases. Therefore, when each pair of internal sense bases and external sense bases is presented, the associated consciousness (viññāṇa *or vinyan*) arises. From the interaction of each couple of sense organs and sense objects, with organ consciousness (*vinnana*) present, contact (*phassa)* occurs. A pleasant, unpleasant or neutral sensation (*vedana*) arises from contact. When the memory of this sensation is present, there is perception (*Sanna*). When thoughts of sensation have arisen, conception (*sunkhara*) arises. This is the law of dependent origination (*Patticca-Sampuppada*) leading to suffering.

The Buddha identifies that desire arises from sensations resulting from contact at the six sense bases. Desire consists of the following three types: desire for sensuality *(Kama tanha*), desire for existence *(Bhavatanha)* and desire for non-existence *(Vibhavatanha).* First, when contact occurs with an external sense base motivated by sensuality, the desire for sensuality arises. Second, desire for existence arises when a person wishes to be in a particular situation or has a guaranteed position with a covetous mind. Third, desire for non-existence arises when a person confronts undesirable things or situations. Dislike, anger or hatred will arise in the mind and lead to suffering.

Defilement is identified as the cause of suffering including greed, anger

and delusion. It may arise at any time and lead to suffering. When defilement fades away, it remains the "habit of defilement" in the mind and easily recurs in the future. Greed arises when a person desires to gain something with a covetous mind. Anger occurs when a person desires to push something away with an angry mind. Delusion arises when uncertainty appears in the mind. A person is uncertain regarding his/her actions and whether or not he/she should pull something towards him/her or push it away. Similarly, patients with lower leg fractures are confronted with an undesirable situation and desire to push this situation away, but find the situation difficult to manage. They can feel angry at any time and attempt to push this situation away. As a result, they are faced with suffering in their minds (Varadhammo, 1996).

The third Noble Truth is known as the cessation of suffering *(Nirodha).* When a person follows the Noble Eightfold Path in every activity and every behavior, desire, attachment and defilement do not occur. Clean, clear, calm and cool-minded feelings arise in the mind. The cessation of suffering is associated with the effective adaptation of Roy's Adaptation Model.

The forth Noble truth is the Noble Eightfold Path (Magga). The Buddha used the systematic process of the Noble Eightfold Path to cover every activity and every behavior of human beings. The elements of the Noble Eightfold Path are described as follows:

Right Understanding *(SammāDiṭṭhi)*: Realizing the cause of suffering.

Right Intention (*SammāSaṅkappa)*: Motivation to end suffering.

Right Speech (*SammāVācā)*: Speaking in a way that cultivates clarity.

Wise Action (*SammāKammanta)*: Behaving in ways that maintain clarity.

Right Livelihood *(SammāĀjīva*): Supporting oneself in a wholesome way.

Right effort (*SammāVāyāma)*: Cultivating skillful (peaceful) mind habits.

Right Concentration (*SammāSamādhi)*: Cultivating a steady, focused, easy mind.

Right Mindfulness (*Sammā Sati)*: Cultivating alert, balanced attention.

Right speech, right action and right livelihood are grouped together into the category of Sila. Right effort, right concentration and right mindfulness are grouped together into the category of Samadhi. Right understanding and right intention are grouped together into the category of Panna. The purpose of Sila is to help in the development of mental concentration (Samadhi). Purity of mind helps in the realization of wisdom (Panna) (Tsering, 2005; Varadhammo, 1996).

In the current study, the researcher chose mindfulness, a part of the Noble Eightfold Path, to guide the intervention. The details of the mindfulness concept were described in the last section.

Roy's Adaptation Model

Roy's Adaptation Model was first introduced in publication in 1970 and has developed over time. In this study, Roy's Adaptation Model (2009) is identified as the conceptual framework together with Buddhist philosophy. Roy utilized the concepts of system theory to explain the human adaptive system. Roy views a person as a holistic

adaptive system interrelating with the environment. This system includes input, coping processes, output and feedback processes.

The environments are defined as stimuli affecting the human adaptive system. Stimuli are identified as input caused by interactions between humans and the environment. These can be categorized into the following three types: focal, contextual and residual stimuli. Focal stimuli are the external or internal stimuli most strongly affecting the adaptive system. Contextual stimuli are other stimuli influencing focal stimuli. Residual stimuli are internal and external factors affecting focal stimuli. The influence on the person, however, is not clear.

Environmental changes affect the adaptive system as the person exerts effort toward adjusting effectively by using coping processes involving two major subsystems, namely, the regulator and the cognator subsystems. The regulator subsystem is an adaptive response process that functions automatically, responding through neural, chemical and endocrine factors affecting fluid electrolyte and acid-base balance as well as the endocrine system. The cognator sub-system responds through the following four cognitive-emotional channels: perceptual and information processing, learning, judgment and emotion. Two sub-systems have worked together in order to promote the integrity of the human system. As a result, people show adaptive responses in the following four modes: physiologic, self-concept, role-function and interdependence adaptive modes.

Adaptive response is defined as output including effective response and ineffective response. Output is reflected into input for appropriate adaptation. Successful adaptation depends on the stimuli and adaptation level. Roy categorizes adaptation level

into three levels, namely, the integrated, compensatory and compromised levels. Firstly, the integrated life process is defined as a situation in which human needs have been met due to the structures and functions of life processes working effectively. Secondly, the compensatory process is a situation in which the structures and functions of life processes attempt to adjust in order to meet human needs again. Finally, the compromised adaptation process represents the failure of the structures and functions of life processes to meet human needs. To conclude, when integrated and compensatory levels are inadequate, compromised adaptation is diagnosed. As a result, an adaptation problem occurs.

In order to understand the four adaptive modes identified in Roy's Adaptation Model, the following paragraphs are presented:

The first adaptive mode, the physiologic mode, includes the physical and chemical processes expressing the physiologic activities of cells, tissues, organs and systems of the human body. Physiologic needs consist of oxygenation, nutrition, elimination, activity-rest and protection. Five needs are essential for basic life processes. Furthermore, there are four complex processes, namely, the senses, fluid electrolyte and acid-base balance, neurologic function and endocrine function, which involve the physiologic mode. These processes function as a mediator for neural, chemical and endocrine activities. When the five physiologic needs and four complex processes work effectively, physiologic integrity is achieved.

The second adaptive mode, the self-concept mode, involves the beliefs and

feelings of persons, depending on internal perceptions and the perceptions of other people. Self-concept is composed of two subareas, namely, the physical self and the personal self. The physical self refers to a person's self-appraisal of physical being, including physical attributes, functioning, sexuality, health/illness and appearance. This sub-area consists of body sensation and body image. Body sensation is adaptation regarding a person's feeling toward physical being. Changes in physical being may affect responsive adaptation such as ineffective sexual function, loss and so on. Body image is the view, perception and acceptance of a person's appearance such as size, shape and posture. Changes in appearance may affect adaptation problems, including negative and unacceptable physical image.

A personal self refers to a person's appraisal regarding personal characteristics, expectations, values and worth. This sub-area consists of self-consistency, self-ideal and a moral-ethical-spiritual self. Self-consistency is the feeling of striving to achieve equilibrium when confronted with trouble. If self-consistency is threatened, a person feels uncertainty. Fear and anxiety are the results of threats to self-consistency. Self-ideal is the person's anticipation about doing something. It is an individual's basic goal for behavioral achievement. Unworthiness, hopelessness and powerlessness are the results of adaptation problems with self-ideal. The moral-ethical-spiritual self is believed to be related to the morality, ethics, religion and values a person uses as criteria for appraising self-performance. Adaptation problems with this component are guilty feelings and blameworthy actions.

Psychic integrity together with spiritual integrity is identified as the basic

need of the self-concept mode and health essentials. Roy's Adaptation Model views psychic integrity and spiritual integrity as affecting behavior. Therefore, the compromised processes of the self-concept mode may disturb behavior in order to maintain health.

The third adaptive mode, the role-function mode, is related to the roles and functions a person occupies in society. Social expectation determines which roles a person plays in relation to other people. Social integrity is defined as the basic need of the role function mode. When a person is able to act appropriately, social integrity is achieved. Roy classified roles into three levels, namely, primary, secondary and tertiary roles.

Most behavior is determined based on primary roles because this role is based on the gender, growth and development of each age such as school age, child roles and elderly roles. Secondary roles are associated with primary roles. These roles fulfill the expectations of the developmental stage and primary roles. People have one primary role, but many secondary roles. For instance, a 28-year-old young adult female could be a wife, mother and doctor. Thus, secondary roles require specific role activities. Role development and role transition are crucial in secondary role function. The problems related to role function frequently emerge from secondary role function. Tertiary roles are transient roles related to secondary roles. These roles are chosen by individual or social group activities such as chairman or football coach roles.

Roy used a structural approach to assess developing roles. The structural

approach is divided into two parts, namely, instrumental and expressive behaviors. The instrumental behaviors or goal-oriented behaviors are activities in which people act, depending upon social expectations, while the expressive or affective behaviors are activities based on feelings and attitudes toward role requirements. The compromised processes of role function refer to inappropriate instrumental and expressive behaviors. The adaptation problems of role function mode include ineffective role transition, role distance, role conflict, and role failure.

The forth adaptive mode, the interdependence mode, involves interactions with other people similar to the role function mode. Nevertheless, interdependence emphasizes close interpersonal relationships rather than role requirements. Relational integrity is defined as the basic requirement of the interdependence mode and refers to a feeling of security in relationships.

The interdependence mode focuses on interdependent relationships involving the ability to give and accept love, respect and value. Balance between independence and dependence helps a person achieve the interdependent mode. With appropriate contributive and receiving behavior, a person can live with others in society with a sense of stability and security. Interdependent relationships are classified as significant others and support systems. Significant others refer to the most important people to whom a person gives love, respect and value rather than others in society. The most significant others are family members such as fathers, mothers, husbands and wives, etc. Support systems include other people, groups and organizations in which a person is involved in order to attain interdependent relationships. The compromised processes of

the interdependence mode comprise separation anxiety, loneliness and aggression (Roy, 2009).

Adaptation of Thai Buddhists with Lower Extremity Injury: through the Lens of Roy's Adaptation Model

Lower extremities refer to eight different regions, namely, the foot, ankle, leg, knee, thigh, hip, pelvis and other regions (Hanna & Austin, 2008). Mechanisms of injury for lower extremity can be divided into two categories, namely, low-energy injuries or indirect trauma and high-energy injuries or direct trauma. Falls and athletic injuries are grouped into low-energy injuries and typically result in spiral or oblique fractures, while motor vehicle injuries and gunshot wounds are grouped into high-energy injuries and frequently result in transverse or comminuted fractures.

Due to lower extremity injury, the structure and function of the musculoskeletal system and lifestyles are suddenly changed. The injuries and treatments give patients discomfort and pain when changing positions or movements. These patients cannot perform the activities of daily living (ADL). As a consequence, they are required to depend on other people. These changes affect patients psychologically, emotionally and socially as patients adapt to physical changes, lifestyle changes, role changes and relationship changes. Through the lens of Roy's Adaptation Model, lower extremity injuries have been viewed as focal stimuli. The changes of structure and function of the musculoskeletal system activate patients to use regulator and cognator coping sub-systems as a coping process. The consequences of lower extremity injury affect four

adaptive behaviors including physiologic, self-concept, role function and interdependent modes.

Physiologic Mode

Lower extremity injuries affect the structure and function of the musculoskeletal system. These injuries can be presented regarding imbalance between activity and rest. Activity is the body's movement in ADL performance and promote function of the musculoskeletal system and other organs. Rest is the process in which the body moves slowly. Rest is a time for repairing and producing new energy. Lower extremity injuries prevent patients from ADL performance and moving anywhere. Prolonged immobilization results in muscle atrophy and joint stiffness. In addition, pain due to injury and treatment is a cause of sleep disturbance. Due to inadequate rest, the phagocytosis processes of leukocytes decrease as the possibility of infection increases. Moreover, catecholamine, glucagons and cortisol are released to inhibit protein synthesis which delays the wound healing process (Subongkosh, 2003). As a consequence, the extent of physical impairment arises. Previous studies have shown that physical impairment is a predictive factor influencing return to work among patients with lower extremity injuries (MacKenzie et al., 1998). In addition, one case-control design examined the relationship of posttraumatic stress disorder (PTSD) with six types of physical traumas, namely, spinal disorders, extensive burns, amputation, heart failure, major chest trauma and cardiac arrest. The aforementioned findings indicate that the

physical impairments of spinal injury, extensive burns, amputation and heart failure have been described as a risk factor for developing PTSD (Martz & Cook, 2001). These four physical impairments have demonstrated the residual disabilities contributing to psychological and spiritual disturbance; posttraumatic stress disorder consequently occurs. According to this information, the compromised physiologic mode can be defined as focal stimulus directly affecting the self-concept and role function modes.

Self-concept Mode

Within the self-concept mode, changed structure and function of lower extremity injuries affect physical image and the body's sensation of the physical self. Some patients cannot accept this change, feeling loss and uncertainty about future life. Self-consistency is threatened. As a result, fear and anxiety occur. The prevalence of lower extremity injuries is frequently encountered in working adults who have several future goals and attempt to achieve those goals. The consequences of lower extremity injury obstruct future goals. As a consequence, some patients feel worthless, hopeless and powerless. Hence, lower extremity injuries lead to compromised self-idea. Lower extremity injuries due to traffic accidents might be related to guilty feelings and blameworthy actions when patients are identified as inmates or have experiences with bereavement due to traffic accidents. Therefore, lower extremity injuries affect the moral-ethical-spiritual self of the personal self. The changed structure and function of lower

extremity injuries contribute to psychological distress which demonstrates two emotional symptoms, namely, anxiety and depression (Wiseman, Foster & Curtis, 2012).

Acute stress disorder (ASD) appears in the early phase after traumatic Injury (Bonanno, 2004). ASD comprises dissociative symptoms, persistent re-living of the traumatic event and marked avoidance of stimuli associated with the trauma, which might cause distress and symptoms of anxiety with heightened arousal (Robert, Kitchiner, Kenardy & Bisson, 2012). ASD is a group of symptoms diagnosed between two days and one month following traumatic events (Forbes et al., 2007). Survivors exhibiting these symptoms for over a month are identified as patients with acute posttraumatic stress disorder (PTSD). Previous studies have shown that survivors of motor vehicle accidents displaying signs of ASD amount to 13% and more than 70% of motor vehicle accident victims with ASD criteria have developed into PTSD at 6 months following accidents (Harvey & Bryant, 1998). Hence, ASD may be a significant predictor of PTSD. Therefore, health care providers should practice routine screening in order to detect the presence of ASD (Bisson et al., 2004).

Anxiety is an emotional response occurring together with depression. Several studies have shown that depression and anxiety during rehabilitation have a negative impact on the recovery process (Weigl et al., 2007). Ottosson and colleagues found patients with traffic-related minor musculoskeletal injuries who had high anxiety scores to show a risk for non-recovery 12 months after injury (Ottosson, Pettersson, Bergman & Ponzer, 2010).

PTSD is an anxiety disorder that can develop when people are confronted

with stressful situations over long periods of time and includes three symptoms, e.g. repeated re-living the trauma, avoidance of reminders and symptoms of numbness with symptoms of heightened arousal (American Psychiatric Association, 2000). When these symptoms are presented for more than three months, chronic PTSD is diagnosed. The presence of PTSD symptoms is associated with disability and social functioning after injury (McCarthy et al., 2003; Nash & Watson, 2012; Palyo & Beck, 2005; Ponsford et al., 2008). For instance, one cross-sectional study of 164 veterans showing participants who screened positive for PTSD reported poorer social functioning than participants who screened negative for PTSD (Tsai, Harpaz-Rotem, Pietrzak & Southwick, 2012). Palyo and Beck examined the differential association of pain and PTSD symptoms with physical and psychosocial impairment. They found that PTSD symptoms have direct effects on psychosocial impairment and indirect effects on psychosocial impairment via perceived life control (Palyo & Beck, 2005).

Depression is a mood disorder consisting of major depression and mixed mood disorders. It is a common mental health problem related to traumatic injury (Wiseman et al., 2012). The incidence of moderate-to-severe depression and severe depression at 3 months following lower extremity injury are found to be 42.4% and 15.6%, respectively. At 12 months, the incidence of moderate-to-severe depression decreases to 37.6%, while the incidence of severe depression increases to 19%. The aforementioned findings conclude that depression does not decrease over time (McCarthy et al., 2003).

Depression is defined as a major risk for returning to pre-injury function

(Richmond et al., 2009). Urquhart (2006) found that, although the incidence of depression decreases, residual disability continues to present for 12 months after injury. Furthermore, post-injury depression occurs in the aftermath of traumatic injury, regardless of injury severity. Richmond and colleagues (2009) found post-injury depression to be capable of occurring in minor physical injuries. This finding showed that post-injury depression at 6 months affected return to pre-injury levels of function and continued through 12 months after injury.

Psychological distress is associated with poorer functional and occupational consequences (Kendrick et al., 2011), presence of depression and long-term problems related to loss of employment or delayed return to work (Holtslag, Beeck, Lindeman & Leenen, 2007; Zemper, et al., 2003). Twenty-five percent of patients with lower extremity injury have not returned to work after 1 year and one-fifth of those have not fully recovered at 30 months (Laurence, Ellen, Brad, Gregory, John & Andrew, 1996).

In summary, literature reviews have demonstrated that compromised self-concept and psychological distress following traumatic injury result in compromised secondary role function in terms of return to work and meaningful function. Simultaneously, compromised self-concept contributes to the extent of physical impairment, functional limitation and residual disability.

Role Function Mode

Lower extremity injuries have an effect on the structure and function of the musculoskeletal system such as reduced range of motion and muscle strength. As a result, physical impairment happens and can contribute to functional limitations. Patients are unable to perform ADL; hence, they need to depend on other people. At the same time, physical impairment and functional limitations result in delayed return to work. Based on the statistics, lower extremity injuries due to road traffic accidents are prevalent among younger adults. People in this group have focused on participation in work as a vital part of their lives and they are concerned about their ability to manage at work (Cole, Mondloch & Hogg-Johnson, 2002).

In a study of outcomes of patients with orthopedic trauma, patients were reported disability (79.5%), ongoing moderate to severe pain (37.2%) and inability to return to work (35.2%) from 6 months following orthopedic trauma (Urquhart et al., 2006). Furthermore, patients with single or multiple orthopedic injuries and other injuries have poorer outcomes than patients with single or multiple orthopedic injuries alone. The outcomes of more injuries are related to persistent physical disabilitywhich are consistent with the results of previous studies (Butcher et al., 1996; Holbrook et al.,1999; Van der Sluis, ten Duis & Greertzen, 1995).

The risk of not returning to work or delayed return to work due to functional limitations affects personal, social and financial burdens (Clay et al., 2010). Patients are unable to work as well as they did before trauma and some patients have to

change their jobs or become unemployed. Accordingly, Holtslag and colleagues (2006) found that all patients with lower extremity injuries would have experienced mild to moderate disability and 27% of those cannot be employed in their previous work. As a result, patients and families suffer from loss of income. These patients are more stressed with emotional and behavioral changes affecting family members. Some studies have represented the relationship between physical disabilities and psychological distress following traumatic injury.

To conclude, compromised physiologic mode and self-concept mode are defined as focal stimuli contributing to secondary role-function mode. At the same time, compromised secondary-role function mode may be identified as contextual stimulus affecting the self-concept mode.

Interdependence Mode

Lower extremity injuries result in structural and functional changes in the musculoskeletal system. Patients cannot solve these problems by themselves; they need to depend on other people. Immobilization due to injury and treatment disturb relationships between patients and significant others such as parents and spouses. Sometimes, these patients feel conflict regarding dependence on other persons and present compromised behavior such as aggression and anxiety. The interdependence mode is focused on intimate relationships; thus, several studies have mentioned social support from significant persons and other social support systems to be crucial in this

adaptive mode. Like lower extremity injury patients, they require social support in order to pass through the adaptive process. Therefore, the interdependence mode can be identified as contextual stimulus either facilitating or inhibiting the self-concept and role function modes.

Of the four adaptive behaviors, the researcher focused on both the Adaptive modes of physiologic and self-concept because the compromises in these areas are severe and require improvement within a proper amount of time. As a result of the integrated physiologic and self- concept, compromised role function and interdependence modes can be promoted later. In the current study, the physiologic mode focuses on physical functioning. The self-concept mode focuses on the psychological distress resulting from lower extremity injuries and spiritual well-being. The following paragraph demonstrates the definition of physical functioning, psychological distress and spiritual well-being, factors influencing physical functioning, psychological distress and spiritual well-being together with instruments evaluating physical functioning, psychological distress and spiritual well-being.

Physical functioning

Definition of Physical functioning

According Roy's Adaptation Model, physical functioning is defined as an adaptive problem related to the physiologic mode. Many literature reviews have shown the definition of physical functioning as follows:

Stewart, & Painter (1997) cited in Painter (2005) defined physical functioning as “an individual’s ability to perform activities required in their daily lives determined by many factors including physical fitness, fitness strength, sensory function, clinical condition, environmental factors and behavioral factors”.

Royall et al (2007) cited in Tomey, K.m., & Sowers, M.R. (2009) defined physical functioning as “conceptualized as being supported by physical abilities such as walking, reaching, vision, and hearing, as well as by those in the cognitive domainsuch as spatial orientation, short-term memory, intelligible speech, and alertness”.

Garber et al (2010) defined physical function as “the ability to perform both basic and instrumental activities of daily living, and the ability to reside in the community depends to a large extent on their level of physical function”.

Painter, stewart, & Carey (1999) cited in Shaha et al (2017) defined physical function as “the ability to perform the basic actions (i.e., mobility, strength, and endurance) that are essential for maintaining independence and carrying out more complex activities”.

To sum up, physical functioning is the ability of an organ or other part of the body to perform or coordinate specific activities of daily living (ADL). Due to lower extremity injury, muscle strength is an important factor affecting physical function and range of motion is an important predictor of physical function. Therefore, range of motion and muscle strength are both considered empirical indicators.

Factors Influencing Physical Functioning

1. Age

Age is identified as a demographic factor influencing physical functioning. One prospective study identified older trauma patients to be correlated with poorer functional outcome than younger age (Nemunaitis, Roach, Claridge, & Mejia, 2016), which is consistent with previous reports. Zatzick et al. (2002) explored functional outcome among participants who survived from intentional and unintentional injuries and found that increased age is a predictor for lower scores in the physical functioning subscale of the SF-36. De Filippis et al (2004) had shown in similar way that young patients with osteoarthritis had better physical functioning than older patients with osteoarthritis. Similar findings were found in another three studies. Older age was significantly reduced of muscle function group of ankle after lower limb fracture (Gaston, Will, McQueen, Elton, & Court-Brown, 2000). The older patient with unstable ankle fractures following open reduction and internal fixation had worse score on mobility, daily activities and dysfunction when assessing with Short Musculoskeletal Function Assessment (SMFA) questionnaire (Obremskey et al., 2009). Haas and colleague (2013) revealed that survivors aged 65 year or older had significant reduction in the ability to perform activities of daily living when follow-up two year after discharge from an intensive care unit (ICU). Therefore, age is one of the crucial factors affecting physical functioning.

2. Gender

Gender is one of the demographic factors affecting physical functioning. However, the literature review cannot be concluded as a consensus because there are many different findings between males and females. For instance, there were no gender differences in terms of functional outcomes and health status by using the musculoskeletal function assessment (MFA) and the Short Form 36 (SF-36), respectively (Sutherland et al., 2005). It is similar to other studies that there were no gender differences of physical functioning in ICU survivors two years after discharge (Haas et al., 2013). The gender factor was not a key predictor for functional outcome after trauma (Nemunaitis et al., 2016). However, several studies have revealed that females have worse physical and psychological outcomes following orthopedic injuries. For instance, functional outcomes measured by the Quality of Well-Being Scale were significantly lower at 6-, 12- and 18-month follow-ups in women when compared to men (Holbrook et al., 2001; Holbrook & Hoyt, 2004). In addition, in a study of health status of patients with major trauma assessed by the Euro Quality of life (EQ-5D), it was concluded that the female gender was a significant predictor of decreased long-term functional outcome (Vles, Steyerberg, Essink-Bot, Beeck, Meeuwis & Leenen, 2005).

For the female gender, the hormonal effects of estrogen are defined as an intrinsic factor affecting the bone healing process. Estrogen has an effect on neuromuscular and function throughout the menstrual cycle, but decreases during the premenstrual phase. Estrogen helps promote bone density and reduces the risk of osteoporosis. Estrogen plays a role by improving the absorption of calcium and

decreasing elimination of calcium. Hence, females with abnormal menstrual periods, menopause earlier than the late 40s, or removed ovary surgery before age 45 without receiving hormone therapy are defined as being at high risk for developing osteoporosis. In addition, females in the premenstrual phase should be recognized for the risk of developing osteoporosis (Hoogenboom, Schuemann & Smith, 2007). The WHO describes the age of 40 as a cut-off point for identifying premature menopause age (Okeke, Anyaehie, & Ezenyeaku, 2013). To sum up, gender is considered as one factor influencing physical functioning.

3. Psychological Disturbance

The psychological disturbances following injury would be significant risk factors affecting physical functioning. A study of Ayers and colleagues (2013) who summarized that emotional health problems such as depression are the risk factors affecting functional outcome after orthopedic surgery. In addition, acute stress disorder (ASD) following traumatic physical injury is a cause of poor physical functioning, reduced activities of daily living, and decreased quality of life (Wiseman, Foster, & Curtis, 2013). Zatzick et al. (2002) demonstrated that patients with PTSD have lower scores in the roles of physical and emotional functioning, pain and general health, vitality, social functioning and a mental health subscale of SF-36 compared to patients without PTSD. Furthermore, PTSD at one year was the strongest predictor of decreases in mental health. Richmond (2003) determined that high levels of psychological distress during hospitalization and at three months following discharge were found to be early

predictors of long-term disability after injury. O'Donnell (2005) who found that patients with physical injury who have higher levels of acute stress syndrome and depression would report higher levels of disability and lower quality of life when compared with the normative population. Similar findings were found in other two studies. Bhandari (2008) showed that the global severity of psychological symptoms was significantly and negatively associated with the mental component summary scores of the SF-36 while the intensity of psychological symptoms were found to be significantly and negatively associated with the physical component summary scores of the SF-36. Sutherland and colleagues examined the association between posttraumatic psychopathology and the functional recovery of musculoskeletal trauma patients, it was found that psychological disturbance at two months was capable of predicting long-term functional outcome at six months and five years after injury (Sutherland, Suttie, Alexander & Hutchison, 2011).

Therefore, psychological disturbance following injury is identified as a noteworthy factor affecting physical functioning.

4. Location of Injury

Location of injury is identified as peri-injury factors influencing physical functioning in terms of physical impairment. In particular, patients with traumatic brain injury, spinal cord injury or lower extremity injury had more functional limitations than injuries in other areas (Holtslag et al., 2007). Thus, in term of orthopedic injury, lower extremity injury is considered as factor affecting physical functioning outcomes. In a study by Sluys, Shults, & Richmond (2016) who compared health related quality of life

between upper and lower extremity injury by using the Functional Status Questionnaire (FSQ) at 1-2 weeks, 3, 6 and 12 months after injury, they found that patients with lower extremity injury had significantly lower basic ADL and intermediate ADL of FSQ at 1-2 weeks and 3 months after injury. This finding is consistent with a previous study that patients with lower extremity fractures have poorer functional outcome than those with fractures in other locations (Ponsford et al., 2008). Therefore, lower extremity injury has an effect on negative physical functioning outcomes.

Instrument for Assessing Physical Functioning

Based on the International Classification of Functioning, Disability and Health (ICF), biopsychosocial model is used as conceptual framework. Functioning and disability are considered as outcomes which health conditions and contextual factors are interacted. Functioning included all body functions, activities and participation. Whereas disability referred to impairment, activity limitations and participation restrictions (WHO, 2002). The aftermath of lower extremity injury may affect impairment, activity limitation and participation restriction (Kearney & Pryor, 2004). Several terms are defined by WHO (2002) such as:

"Body functions are physiological functions of body system".

"Impairment are problems in body function or structure such as a significant deviation or loss".

"Activity limitations are difficulties an individual may have in executing

activities”.

“Participation restrictions are problems an individual may experience in involvement in life situations”.

According to above definition, lower extremity injury is a significant deviation of body function, thus lower extremity injury is related to impairment. Therefore, lower extremity injury is a problems in lower extremity organs function. Previous studies have suggested that range of motion and muscle strength as the markers for assessing physical impairment (Jung & Yamasaki, 2016; Mock et al., 2000).

The following paragraphs will describe all of the measurements:

1. Muscle Strength

Muscle strength was assessed by manual muscle testing (MMT). MMT was developed by Wright and Lovett (1912) as a mean of testing and grading muscle strength based on gravity and manually applied resistance. In the MMT, the Medical Research Council (MRC) described this scale as an ordinal scale frequently used to detect the magnitude of strength by grading muscle strength from 0 (zero) to 5 (normal). Grade 5 refers to full available ROM which is achieved against gravity and is able to demonstrate maximum resistance. Grade 4 indicates full available ROM is achieved against gravity and is able to demonstrate moderate resistance. Grade 3 presents full available ROM is achieved against gravity and is not able to demonstrate resistance. Grade 2 indicates full available ROM is achieved only with gravity eliminated. Grade 1

describes a visible or palpable contraction is noted, with no joint movement. Grade 0 identifies no contraction. Grade of 0 to 2 represent gravity-minimized position, and grade of 3 to 5 show increasing degrees of resistance applied as an isometric hold at the end of the test range (Lu & Lue, 2012; O' Dell, Lin, Singh, & Christolias, 2016; Write, 2014).

2. Passive Range of Motion (PROM)

In the clinical setting, PROM is measures with universal goniometer (White, 2014). In this study, hip flexion, hip extension, and knee flexion were used to evaluate physical functioning after lower extremity injury.

Hip flexion relates to many muscles including Iliacus, Psoas, Tensor fascla lata, Rectus femoris, Pectineus, and Adductor longus, brevis, anterior portion of magnus. Hip flexion can be measured with the patients in a seated or supine position. Patients with lower extremity injury cannot in the sitting position, therefore the research assistant forces the hip into extension, applying force over the distal anterior thigh. Normal PROM of hip flexion is 0 to 120 degrees. Hip extension associates with Gluteus maximus muscle. Hip extension can be tested with the patient in a prone position. The hip is extended with the knee flexed to 90 degrees. The research assistant attempts to flex the hip, applying force over the distal posterior thigh. Normal PROM of hip flexion is 0 to 30 degrees. Knee flexion relates to many muscles such as Semitendinosus, Semimembranosus, and Biceps femoris. The knee is flexed at 90 degrees in the prone position. The research assistant attempts to extend the leg, applying pressure over the

posterior tibia surface. Normal PROM of hip flexion is 0 to 135 degrees (O' Dell et al, 2016).

Psychological Distress

Definition of Psychological Distress

According Roy's Adaptation Model, psychological distress is defined as an adaptive problem related to the self-concept mode. Many literature reviews have shown the definition of psychological distress as follows:

Mirowsky and Ross (2002) defined psychological distress as "a state of emotional suffering characterized by symptoms of depression and anxiety" (p.1).

The McGraw-Hill Concise Dictionary of Modern Medicine (2002) described psychological distress as "the end result of factors such as psychogenic pain, internal conflicts and external stress that prevent a person from self-actualization and connecting with 'significant others".

Carney and Freedland (2002) provided an additional definition of psychological distress, "It is a nonspecific term that encompasses sadness, frustration, anxiety and a number of other negative mood states. It is included in both mild and severe forms of these mood states, as well as both transient and persistent ones. It also refers both to symptoms of psychiatric disorders and normal emotional responses to adversity" (p.5).

According to Ridner (2004), psychological distress is identified as an

emotional disturbance that affects social functioning and daily life. The characteristics of psychological distress consist of the following: (1) "perceived inability to cope effectively; (2) change in emotional status; (3) discomfort, (4) communication of discomfort and (5) harm" (p. 539).

According to Drapeau, Marchand & Beaulieu-Prevost (2012), psychological distress is broadly defined as emotional suffering and frequently used as an indicator of mental health and an outcome in clinical trials and intervention studies.

In summary, the prese study defines psychological distress as Maladaptive psychological function when a person is confronted with stressful events following lower extremity injuries. The distress is characterized by symptoms of anxiety and depression affecting somatic symptoms, social functioning and daily life. Psychological distress is associated with the self-concept mode of Roy's Adaptation Model because the model asserts that the integrated and compensatory aspects of the adaptive level are inadequate and a compromised adaptive level is diagnosed. As a result, Roy's self-concept is disturbed.

Prevalence of Psychological Distress following Lower Extremity Injury

The prevalence of psychological distress following lower extremity injury is high. Rajeswari (2015) revealed the socio demographic including age between 20-40, female, crush injury and 3-6 months after injury had a significant association with prevalence of posttraumatic stress disorder (PTSD) following orthopedic injury. The

findings were consistent with previous studies. McCarthy et al. (2003) demonstrated that patients with severe lower limb injury had severe psychological distress levels between three- and twenty-four months after injuries. The percentages of patients reporting severe psychological distress at three, six, twelve, and twenty-four months after injury were 19.2%, 18.7, 19.2%, and 21.2%, respectively. These findings concluded that psychological distress did not decrease over time. Bhandari et al. (2008) showed the prevalence of psychological distress after orthopedic trauma by using the Global Severity Index of the Symptom Checklist-90-Revised (SCL-90-R) at 22%. Wegener et al. (2011) picked up the four scale of Brief Symptom Inventory (BSI), including anxiety scores, obsessive-compulsive scores, depression scores and interpersonal sensitivity scores to measure psychological distress following severe leg injury. The findings indicated the level of psychological distress to be high when compared with population norms. To conclude, the prevalence of psychological distress following lower extremity injury is high and significant. Appropriate management needs to understand the factors influencing psychological distress and seek effective interventions to reduce psychological distress. The following paragraph will address the factors influencing psychological distress.

Factors Influencing Psychological Distress

1. Age

Age is defined as a demographic factor influencing psychological distress. Most findings are concordant to determine that younger age identifies as a significant factor contributing to psychological distress. For example,

McCarthy et al. (2003) demonstrated that younger patients with severe lower-limb injury were five to six times more likely to screen positive for psychological distress compare with older patients. Richmond and colleagues (2003) found that older survivors have lower levels of post-injury psychological distress than younger survivors. In addition, older patients have more resilience, thus enabling them to feel better quickly after confronting stressful events. This finding concurred with Bampenphat (2001) who studied the relationships among stress, personal factors and coping strategies of patients with skeletal traction. The results showed that age factor and stress can predict palliative coping at 13.5%. Due to increased age, patients confront problems through learning and experience. Therefore, they can cope with their problems by selecting appropriate coping strategies. Consequently, stress would be reduced by age.

2. Gender

Gender is identified as a demographic factor affecting psychological distress. The findings between male and female genders differ on psychological distress. Sutherland et al. (2005) explored psychological outcome among patients with

musculoskeletal trauma and found no significant differences between males and females in psychological outcomes evaluated by the General Health Questionnaire (GHQ). Conversely, several studies have shown that the female gender was an individual factor influencing the risk for developing psychological distress (Holbrook et al., 2001; Holbrook, Hoyt, Stein & Sieber, 2002; Norman, Stein, Dimsdale & Hoyt, 2008). Females have been found to report a higher level of psychological disturbance with regard to the injury event than males and this difference has been found to be statistically significant (Andersson, Dahlback & Bunketorp, 2005; Holbrook et al., 2001; Holbrook et al., 2002).

3. Ethnicity

In western countries such as the USA and Australia, ethnicity/race has been defined as a demographic factor influencing psychological distress after injury because of the minority populations and immigrants in these countries. Minority populations cannot access health care systems due to communication problems, low incomes, insurance issues and laws. Minority populations also experience higher levels of psychological distress in the Brief Symptom Inventory when compared with majority populations (McCarthy et al., 2003). Previous studies of refugees demonstrate high rates of posttraumatic stress disorder and depression (Nickerson, Bryant, Silove & Steel, 2011). Pre-migration traumatic event involvement and post-migration stressors such as immigration detention contribute to psychological distress (Steel, Silove, Brook, Momartin, Alzuhairi & Susljik, 2006).

Thailand has been affected by ethnicity factors in terms of labor migrants from Myanmar, Laos and Cambodia. These migrants do not speak the local language. As a result, communication problems occur. Furthermore, migrants do not have the money to pay for health coverage. Therefore, they may not be able to access the health care system (Barker, 2011). One study of female migrants from Burma has shown migrants to be abused by employers. Sexual violence and other abuses are common. Migrants cannot ask for proper health care due to limits such as illegal status, lack of funds and lack of Thai language skills. These problems contribute to psychological distress (Caouette, Archavanitkul & Pyne, 2000).

4. Pain

Pain is defined as a peri-injury factor contributing to psychological distress. It is a complex experience with sensory, affective, behavioral and cognitive characteristics (Puntillo, Miaskowski & Summer, 2003). It is a personal experience that remains valid as long as a person confirms its existence (McCaffery, 1979). Pain has a variety of causes, but the most frequently and commonly encountered cause is direct or indirect damage to body tissue (International Association for Study of Pain, 1979 as cited in Puntillo et al., 2003). When tissue is damaged, some chemical substances, such as cytokines, are released to subsequently stimulate sensory nerve fibers to transmit the pain sensation to the central nervous system.

With regard to physical traumatic injury, pain is identified as a peri-traumatic risk factor affecting physical and psychosocial consequences. Norman (2008)

studied the relationship between peri-traumatic pain and posttraumatic stress disorder (PTSD) and found an increase of pain scale 24-48 hours after injury to contribute to an increase of PTSD at 4 months and 8 months. Ponsford et al. (2008) examined the factors influencing outcomes following orthopedic trauma. The results showed that severity of pain measured by the Brief Pain Inventory (BPI) has a significantly negative correlation with scores on the SF-36 mental component summary score. This finding confirmed that pain results in psychological morbidity.

5. Injury Severity

Injury severity is a peri-injury factor influencing psychological distress. However, the results are not concordant. Several studies have shown patients who sustain moderate to severe injuries to present serious psychological morbidity compared with patients who sustain mild to moderate injuries (Koren et al., 1999; Michaels et al., 2000). In common with Malik et al (2012) which confirmed the psychiatric morbidity of handicapped patients following orthopedic traumatic injury was higher in intensity and severity after more severe injury. Nevertheless, some studies have shown that injury severity has no association with psychological distress (Bhandari et al., 2008; Norman et al., 2008; Ponsford et al., 2008; Richmond et al., 2009). Mild to moderate injury severity level have an effect on psychological distress as well as moderate to severe injury severity

In summary, these results were not consensus. Therefore injury severity factor might or might not affect to psychological distress.

Instrument for Assessing Psychological Distress

In principle, psychological distress should be assessed with self-report from participants and clinical interviews (Drapeau et al., 2012). Several instruments are currently available for use in evaluating psychological distress, including the Symptom Checklist-90-Revised (SCL-90), the Brief Symptom Inventory-53 (BSI-53), the Brief Symptom Inventory-18 (BSI-18), the general Health Questionnaire and. The following paragraphs will detail each instrument:

1. Symptom Checklist-90-Revised

The Symptom Checklist-90-Revised (SCL-90-R) consists of a primary dimension and global indices which developed by Derogatis (1992).The primary dimension includes nine symptom scales such as somatization, obsessive-compulsive, interpersonal sensitive, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. The three global indices are composed of the global severity index, positive symptom distress and positive symptom total. This instrument uses a 5-point Likert scale for total questions. If patients have T scores of ≥ 63, they are diagnosed with psychological disorder (Bhandari et al., 2008).

The SCL-90-R is used to assess psychological distress following trauma. However, due to its lengthy and time-consuming characteristics, some studies select only certain subscales to measure psychological disturbance. For example, Pirente et al. (2007) picked up the depression and anxiety subscale of the SCL-90-R to evaluate depression

and anxiety of patients with multiple traumas following psychotherapy. The SCL-90-R was also used to investigate the extent of psychological distress following orthopedic trauma (Bhandari et al., 2008) and to evaluate psychological problems at 12 months and 2 years after severe orthopedic trauma (Ponsford et al., 2008). Due to its lengthy and time-consuming characteristics, the SCL-90-R was not popular to evaluate psychological distress.

2. Brief Symptom Inventory-53

The Brief Symptom Inventory-53 (BSI-53) is an abbreviated form of the Symptom Checklist-90-Revised (SCL-90-R) and contains 53 items (Derogatis, 1993) in order to assess psychological distress (McCarthy et al., 2003; Weninger, Aldrian, Koenig, Ve'csei & Nau, 2008). The average of all 53 items provides an overall assessment of psychological distress, namely, the General Severity Index (GSI). The BSI is composed of nine subscales: (1) the somatization scale refers to distressful reactions to perceived bodily dysfunction; (2) the obsessive-compulsive scale refers to distressful reactions to unwanted thoughts and actions; (3) the interpersonal sensitivity scale refers to feelings of self-inadequacy; (4) the depression scale refers to depressive affect; (5) the anxiety scale refers to anxious affect; (6) the hostility scale refers to hostile thoughts, feelings, and behaviors; (7) the phobic anxiety scale refers to fear responses to particular stimuli; (8) the paranoid ideation scale refers to symptoms of projection, hostility, suspicion and fear of loss of autonomy and (9) the psychoticism scale refers to symptoms ranging from feeling alienated to experiencing delusions (Ostafin et al., 2006). This scale is used for

assessing the psychological symptoms of psychiatric and medical patients as well as healthy individuals during the week preceding data collection. This instrument uses a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely).

The BSI-53 is widely used to evaluate psychological distress following physical traumatic injury. For instance, Michaels et al. (2000) used the BSI to evaluate the presence and severity of psychological distress symptoms 12 months after trauma. The BSI has been employed to measure psychological distress among patients with severe lower-limb injury (McCarthy et al., 2003). One preliminary study used the BSI to evaluate the reduction of psychological distress after receiving intensive mindfulness training (Ostafin et al., 2006). One randomized controlled trial selected the Brief Symptom Inventory GSI score to assess the effects of mindfulness meditation versus relaxation training on psychological distress among premedical students (Jain et al., 2007).

3. *Brief Symptom Inventory-18*

The BSI-18 is a shortened version of the BSI which is a widely used self-report questionnaire that measures general psychological distress. It is the briefest and latest version in a series of instruments designed by Derogatis (2000) to measure general distress. The BSI-18 consists of the three six-item scales somatization, anxiety, depression, and the global scale Global Severity Index (GSI). The BSI-18 scale is a 5-point Likert-like scale which measured with the score of 0 = not at all, 1 = sometimes, 2 = often, 3 = almost always, and 4 = extremely. Six items on the BSI-18 scale, i.e. item

no.1, 4, 7, 10, 13, and 16 measures the presence of somatization. Six items on the BSI-18 scale, i.e. item no. 2, 5, 8, 11, 14, and 17 measures the presence of depression. Another six items on the BSI-18 scale, i.e. item no. 3, 6, 9, 12, 15, and 18 measures the presence of anxiety. The BSI-18 scores were calculated by sum scores. The sum or total score (GSI) of three parts of BSI-18 was ranged between 0-72. Higher score indicates more psychological distress (Meijer, de Vries, & van Bruggen, 2011). Wegener et al. (2011) selected four scales of the BSI including anxiety, obsessive-compulsive, depression and interpersonal sensitivity to assess psychological distress among patients with major lower extremity trauma. The various studies have shown that the BSI-18 is highly correlation of psychological distress. For instance, the psychometric properties of BSI-18 among patients with traumatic brain injury and found that the Cronbach's alpha coefficient for the BSI-18 (GSI) in follow-up participants was .91, and inpatient was .84. (Meachen, Hanks, Millis, & Rapport, 2008). The Cronbach's alpha coefficient for the BSI-18 (GSI) in German participants was .93 (Franke, Jaeger, Glaesmer, Barkmann, Petrowski, & Braehler, 2017), in a Spanish sample of outpatients with psychiatric disorder was .89 (Andreu, Galdón, Dura, Ferrando, Murguri, García, & Ibáñez, 2008). The reliability was mostly above .80 and can be evaluate as good. This finding has shown that the internal consistency of BSI-18 was excellent for healthy, inpatients and follow-up participants. Therefore, the BSI-18 has been selected to measure psychological distress in the present study.

4. General Health Questionnaire

The General Health Questionnaire (GHQ) was developed to assess psychological distress in research and screen for non-psychotic patients in clinical settings. Initially, the instrument comprised 60 items including depression, anxiety and somatic symptoms with social impairment. Currently, there are four versions, namely, GHQ-12, GHQ-20, GHQ-28 and GHQ-30. The differences depend on the number of items. The GHQ-28 is widely used in clinical studies. This instrument uses 4-point Likert scales ranging from 0 (not at all) to 3 (extremely) to rate experience in each symptom over the two weeks preceding data collection. Sometimes, researchers can use a dichotomous scale (0-0-1-1) as an alternative scoring system instead of a 4-point Likert scale. The correlations range between 0.92 and 0.94 (Nilchaikovit, Sukying & Silpakit, 1996).

Within traumatic injury, the GHQ in several versions has been employed. For example, Sutherland et al. (2005) explored psychological outcome after musculoskeletal trauma by using the GHQ-28. In Thailand, Nilchaikhowit and colleagues developed the Thai GHQ from the GHQ of Goldberg (1972) cited in Nilchaikhowit et al.,1996. At the present time, there are four versions, namely, Thai GHQ-60, Thai GHQ-30, Thai GHQ-28 and Thai GHQ-12. All have been found to be well-established in terms of reliability and validity as well as internal consistency. Cronbach's alpha coefficient ranges from 0.84-0.94l; sensitivity and specificity are 78.1-85.3%, and 84.4-89.7%, respectively. The Thai GHQ includes psychological distress in four aspects, namely, unhappiness, anxiety, social impartment and hypocondriasis. Nilchaikhowit and

colleagues recommended the Thai GHQ-28 as a more appropriate measurement for observing symptoms of psychological distress (Nilchaikovit et al., 1996). However, the four aspects of the Thai GHQ-28 do not cover all definitions of psychological distress. Hence, the Thai GHQ-28 was not selected to evaluate psychological distress in the current study.

Spiritual Well-Being

Definition of Spiritual Well-Being

Mosby's Dental Dictionary (2005) defined spiritual well-being as a sense of peace and contentment stemming from an individual's relationship with the spiritual aspects of life.

Yang, Yen, & Chen (2010) defined spiritual well-being as (1) having a subjective feeling of happiness; (2) Affirming the self-worth; (3) managing interpersonal relationships with an open, accepting attitude; and (4) possessing an internal "energy".

Casa Palmera (2012) defined spiritual well-being as an integral part of mental, emotional and physical health. It is considered to be a primary coping resource on the journey of recovery and healing

Azarsa et al (2015) defined spiritual wellbeing as one of the most important factors in human health and healthy lifestyle

Kay Robert (2016) defined spiritual well-being as exploration of a life of meaning, purpose, value, the roles of spirit, or soul, and/or a deeper understanding of self

and connections to the larger community. Moreover, spiritual well-being is one dimension contributing to holistic health.

In summary, spiritual well-being refers to subjective data which person show feeling of happiness, understanding of self, managing interpersonal relationships and having an internal energy in order to promote holistic health.

Instrument for Assessing Spiritual Well-Being

In principle, spiritual well-being should be assessed with self-report from participants and clinical interviews. Several instruments are currently available for use in evaluating spiritual well-being, including the Spirituality Index Well-Being (SIWB), Spiritual Well-Being Scale (SWBS), the following paragraphs were given in detail of each instrument:

Spirituality Index of Well Being (SIWB)

Spirituality Index of Well Being (SIWB) is a self-report measure a dimension of spirituality linked to subject well- being. The SIWB, developed by Daaleman and Frey (2004) consisted of 12 items with 6 self-efficacy and life scheme subscales each aimed to measure a dimension of spirituality linked to participants' well-being. The SIWB is a 5-point Likert-like scale which measured with the score of 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree. Six items on the SIWB scale, i.e. item no.1-6 measures the self-efficacy

subscale. Item no. 7- 12 measures the life-scheme subscale. The SIWB scores were calculated by sum scores. The score ranges between 12 and 60. Higher score indicates more spiritual well-being (Daaleman, & Frey, 2004; Ellison, 2006: Frey, Timothy, & Peyton, 2005). The SIWB is a reliability instrument that can be used in health-related quality of life study. The Cronbach's alpha coefficient for the total score was .91, for the self-efficacy subscale was .86, and for the life scheme subscale was .89 (Daaleman & Frey, 2004). The SIWB was translated into Chinese language. The Cronbach's alpha coefficient for the 12 items was 0.94. For the self-efficacy and life scheme subscales, the Cronbach's alpha coefficients were 0.86 and 0.93, respectively (Wu, Yang & Koo, 2017). According to definition of spiritual well-being and the psychometric property, the SIWB was selected to measure spiritual well-being in this study.

Spiritual Well-Being Scale (SWBS)

Spiritual Well-Being Scale was designed by Paloutzian and Ellison in 1982 (Paloutzian, & Ellison, 1982). The measurement assesses individual and congregation spiritual well-being. SWB consists of 20 items, 10 each from religious and existential well-being. The religious well-being demonstrates an individual's relationship with god, while the existential well-being presents an individual's sense of life satisfaction. Although the psychometric properties of SWB were good, the religious well-being questionnaire has focused on the word of God. Hence, the SWB might not fit for Thai Buddhist patients. Therefore, The SWB was not selected to assess spiritual well-being in this study.

Mindfulness Concept

Definition of Mindfulness

According to Baer (2003), mindfulness is "the non-judgmental Observation of the ongoing stream of internal and external stimuli as they arise". (p. 125)

Kabat-Zinn (2003) defined mindfulness as "the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment-by-moment". (p. 145)

According to Bishop et al. (2004), mindfulness is "a process of regulating attention in order to bring a quality of non-elaborative awareness to current experience and a quality of relating to one's experience within an orientation of curiosity, experiential openness, and acceptance". (p.234)

The concept of mindfulness has emerged from Buddhist meditation techniques (Brown & Ryan, 2003; Delgado-Pastor, Perakakis, Subramanya, Telles & Vila, 2013). Mindfulness is one of the eight constituents of the Noble Eightfold Path taught by the Buddha who found Buddhism more than 2600 years ago (Shonin & Van Gordon, 2016). Although it originated from Buddhist traditions, the concept is taught independently from religion. Buddhism is actually more of a philosophy rather than a religion. Furthermore, it does not require adherence to beliefs or spiritual practice (Shonin, Van Gordon, Slade & Griffiths, 2013). Consequently, mindfulness can be propagated among non-Buddhist people. In western culture, mindfulness was addressed by Thich Nhat Hanh. Subsequently, Kabat-Zinn adapted Hanh's teaching on mindfulness

into an eight-week Mindfulness Based Stress Reduction (MBSR) course was initiated for patients with chronic pain in 1979. Interest in mindfulness has been increased dramatically since then. The MBSR is applied to reduce psychological disturbance due to chronic illness together with treating emotional disorders. Kabat-Zinn is a pioneer who modified mindfulness for people who might not be willing to adopt and use Buddhist traditions (Kabat-Zinn, 2003).

Currently, mindfulness practices are becoming well-known as complementary therapy for medical and psychiatric conditions (Bowlin & Baer, 2012; Delgalo-Pastor, Perakakis, Subramanya, Telles, & Vila, 2013; Jain et al, 2007; Marchand, 2012). Mindfulness practices are categorized into two characteristics based on contextual, process and content level, namely, the Buddhist tradition and Western conceptualization of mindfulness. Within the contextual level, Buddhist tradition needs to be cultivated together with other spiritual practices. In contrast, Western conceptualization of mindfulness requires no specific practice. Within the process level, the former is to be practiced based on the Buddha's teachings, including impermanence, suffering and non-self, whereas the latter puts less emphasis on the Buddha's teachings. Within the content level, Buddhist tradition observes the perception of reaction toward sensory objects. On the other hand, the other focuses on the features of external sensory objects such as sight and smell (Keng et al., 2011).

Mindfulness Buddhist tradition includes Zen meditation, Vipassana meditation and Luangpor Teean's awareness- mindfulness meditation while Western conceptualization of mindfulness comprises Mindfulness-Based Stress Reduction

(MBSR), Mindfulness-based Cognitive Therapy (MBCT), Mindfulness-based Relapse Prevention (MBRP), Dialectical Behavior Therapy (DBT) and Acceptance and Commitment Therapy (ACT). The details of each intervention are described.

1. Zen Meditation

Zen meditation is a Buddhist traditional approach practiced by focusing on the awareness of breathing patterns. Meditators can practice this intervention alone or with a group. During the meditation period, namely, the Zazen, meditators are required to sit silently without changing position. At the beginning level, the practice focuses only on counting breaths whereas advanced meditators add a focus on the here and now, namely, Shikantaza, into the practice. Zen meditation purposes to develop insight regarding self and reality to achieve freedom from suffering (Marchand, 2012). Lehrer and colleagues explored the effects of Zazen on HR variability among a group of Zen practitioners in Japan (Rinzai and Soto practitioners). The results showed Rinzai practitioners had slower breathing rate than Soto practitioners. Practitioners in both groups presented decrease breathing rate within the range of low- and very-low-frequency HR spectral bands and increases HR oscillations within this bands (Lehrer, Sasaki, & Saito, 1999).

2. Vipassana Meditation

Vipassana Meditation (VM) is one of the alternative forms of mindfulness

practice based on Buddhist tradition. VM focused on awareness training in order to achieve emotional stability and happiness (Delgado-Paster et al., 2013). At present, Satya Narayan (S.N.) Goenka has adopted Vipassana Meditation into an intensive 10-day Vipassana retreat program. During first 3 days, meditation practice comprised of focusing attention to the sensations of breathing. After that, meditation practice focused on developing nonjudgmental awareness of body sensations by systematically focusing attention to each area of the body (Ostafin et al., 2006; Shonin et al., 2013). To sum up, the components of this program are mindfulness of breath and awareness of the impermanent nature of thoughts and feelings. Ostafin et al (2006) examined the effects of an intensive 10-day Vipassana retreat program on psychological distress and found the score of psychological distress at 3 months follow-up was lower from baseline. Delgado-Paster and colleague investigated the P3b component of Event-related potentials (ERPs) in experienced vipassana meditators. P3b reflected the allocation of attentional resources for subsequent memory processing. They selected the 30-min meditation task taught by S.N. Goenka including three-sub periods: 10-minute of Anapana, 15-minute of Vipassana, and 5-minute of Metta. The results revealed experienced vipassana meditators had greater P3b amplitudes to the target tone after meditation. It can be conclude vipassana meditation increased attentional resources for subsequent memory processing (Delgado-Paster et al., 2013).

3. Luang por Teean's Awareness-Mindfulness Meditation

Luangpor Teean's awareness- mindfulness meditation was developed by Luangpor Teean Jittasubho in 1957. His meditation technique focused on dynamic moment of the body in order to improve self-awareness. Luangpor Teean's awareness-mindfulness meditation described fifteen steps of cultivation self-awareness: (1) Rest the hand palm down on the thighs (2) turn the right hand onto its edge, be aware; do it slowly, then stop; (3) Raise the right hand to rest on the abdomen, be aware, and then stop; (4) Lower the right hand to rest on the abdomen, be aware, and then stop; (5) Turn the left hand onto its edge, be aware, and then stop; (6) Raise the left hand up, be aware, and then stop; (7) Lower the left hand to rest on the right hand, be aware, and then stop; (8) Move the right hand up to rest on the chest, be aware, and then stop; (9) Move the right hand out, be aware, and then stop; (10) Lower the right hand onto its edge on the tight, be aware, and then stop; (11) Face the right palm down, be aware, and then stop; (12) Move the left hand up to rest on the chest, be aware, and then stop; (13) Move the left hand out, be aware, and then stop; (14) Lower the left hand onto its edge on the thigh, be aware, and then stop; (15) Face the left palm down, be aware, and then stop (Luangpor Teean, 1994; Luangpor Teean, 2004; Luangpor Teean, 2005; Luangpor Teean, 2006; Thaiyanond, 2010).

In the present study, the researcher will apply the Luang Por Teean's awareness-mindfulness meditation which is composed of developing awareness of the body's movement and visualizing thoughts every time they arise (Thaiyanond, 2010).

This method is easy and can be practiced in daily life. This method helps patients be aware of movements in every position such as standing, walking, sitting, lying down and moving. This method is applied not parikamma word like Bud-dho and referred to the four foundation of mindfulness, including mindfulness as regards the body, feeling, mental condition, and ideas.

4. Mindfulness-Based Stress Reduction

Mindfulness-Based Stress Reduction (MBSR) was developed by Kabat-Zinnin (1979) for reducing emotional disturbance in patients with chronic pain. This intervention includes an eight-to-ten-week course for groups of up to thirty participants. Throughout the period, participants spend two to two-and-a-half hours per week in mindfulness meditation instruction and practice. Furthermore, participants should spend time practicing outside the group meeting for at least forty-five minutes per day and six days per week. The mindfulness components comprise sitting meditation, body scan and Hatha yoga (Keng et al., 2011; Marchand, 2012). Eventually, the participants will be less reactive and judgmental toward their experiences while habitual and maladaptive patterns of thinking and behaviors are eradicated (Keng et al., 2011). There were many previous evidences explored the effects of MBSR on psycho-spiritual outcomes. For example, Garland and colleague indicated spiritual well-being of the cancer participants in the MBSR group was significantly better improvement than that of participants in the HA group (Garland, Carlson, Cook, Lansdell, & Speca, 2007). Birnie et al (2010) shown

There were significantly increased mindfulness, spirituality and self-compassion after receiving the MBSR. Marques-Brocksopp (2014) revealed the mindfulness can increase the sense of intrapersonal, interpersonal, and transpersonal of patients with visual impairment, as a result, spiritual well-being is enhancing.

5. *Mindfulness-Based Cognitive Therapy*

Segal and colleagues developed Mindfulness-Based Cognitive Therapy (MBCT) by adding the concept of cognitive therapy (CT) into MBSR to prevent relapse of depression. Negative thoughts have an effect on depression, increasing depressive moods and other symptoms of depression. As a consequence, depression will relapse. MBCT consists of body scan, Hatha yoga and cognitive therapy. Also, the duration of the intervention is similar to MBSR (Keng et al., 2011; Marchand, 2012). Some studies demonstrated the effect of MBCT on psychological problems. Helmes and Ward (2017) examined the effects of the MBCT program on anxiety symptoms of older people in the resident care. The findings showed the MBCT program can reduced anxiety symptoms among older people in the resident care.

6. *Mindfulness-based Relapse Prevention*

Mindfulness-based Relapse Prevention (MBRP) is a Western conceptualization of mindfulness integrating cognitive behavioral concepts with mindfulness skills and regular meditation practice. MBRP is widely used for participants

with alcohol and drug addictions. It encourages participants to be aware of both pleasant and unpleasant sensations, thoughts, feelings and alcohol-related environmental cues. It increases acceptance of psychological and physiological reactions to environmental cues, helps participants to learn non-judgmental awareness and develops the capacity to stay with the present moment. Finally, it enhances self-efficacy and ability to escape from alcoholic consumption (Marlatt & Witkiewitz, 2005 cited in Wikiewitz & Marlatt, 2006).

7. Dialectical Behavior Therapy

Dialectical Behavior Therapy (DBT) is a Western conceptualization of mindfulness that employs fewer meditation-oriented techniques. It was first applied for participants with chronic suicidal behavior and severe borderline personality disorder. Elements of traditional cognitive behavior therapy are integrated with Zen philosophy to form this intervention for improving emotion regulation, interpersonal effectiveness and distress tolerance skills (Baer, 2003; Keng et al., 2011). Some concepts, namely, non-judgmental observation of thoughts, emotion sensation and environmental stimuli are similar to MBSR. Furthermore, visualized thoughts, feelings and sensations are used to foster mindfulness. DBT is classified into four modes of treatment including individual therapy, group skills training, telephone consultation between therapists and patients, and consultation team meetings for therapists (Keng et al., 2011).

8. Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT) is defined as an intervention incorporating mindfulness training because it does not describe its protocol in terms of mindfulness or meditation. However, some concepts of ACT are consistent with mindfulness including acceptance, diffusion, present moment awareness and self as context (Baer, 2003; Grabovac, Lau & Willett, 2011). The remaining concepts are value and committed action (Keng et al., 2011). The purposes of this therapy are to develop present-centered awareness and acceptance in order to control negative thoughts and emotions (Baer, 2003).

The mechanisms of mindfulness and its outcomes

According to the outcomes of this study, the following paragraphs had described regarding the mechanisms of mindfulness on physical functioning, psychological distress and spiritual well-being.

In general, mindfulness ("Sati") is the activity of reflection with non-judgment observation on what presently is happening. It helps one continuously and consciously aware of his/her own body, feeling, mind and mental objects (Phra, 2004). Previous studies revealed the mindfulness-based interventions were associated with brain structure including the right anterior insula, amygdala, orbitofrontal cortex, hippocampus, posterior cingulate, temporo-parietal junction and cerebellum (Filippi, Ceccarelli, Pagani,

Rossi, Stefanelli et al., 2010; Holzel, Carmody, Vangel, Congleton, Yerramsetti, Gard, et al, 2011; Murakami, Nakao, Matsunaga, Kasuya, Shinoda, et al., 2012). These regions specialty involved in learning and memory process, emotional regulation, self-referential processing and perspective taking (Murakami et al., 2012).

In this study, mindfulness is applied to make a cognitive connection between the thoughts and the responses. In term of physical functioning, mindfulness can promote the process of motor learning. Patients with lower extremity injury use the process of motor learning to learn new movements and permanent change in motor performance (Cech & Martin, 2012). Motor learning is "a permanent change in motor performance that occurs as a result of practice" (Cech & Martin, 2012). The process of motor learning into three stages, namely, the cognitive, associative and autonomous stage (Fitts, 1964 as cited in Magill, 2011). In the cognitive stage, the individual has to think about the goal and tries to achieve movement. The focus of this stage is "what movement to do". In the associative stage, the individual has developed a general movement pattern where he/she is ready to refine and improve the performance of a skill. The focus of this stage is "how to do the movement". In the autonomous stage, the individual may not need to focus on motor skills. The movement will automatically go through the right motion. From these three stages, the completion of the cognitive stage is difficult; however, the literature has shown that mental practice such as mindfulness can be effective for learning, relearning of skills and improving skills performance (Magill, 2011). Mindfulness increased gray matter volume in the posterior cingulate cortex, right anterior insula. These areas involved in learning and memory, as a result, mindfulness

can increased learning and memory capacity and motor learning tend to persist after training is stopped (Filippi, Ceccarelli, Pagani, Rossi, Stefanelli et al., 2010; Holzel, Carmody, Vangel, Congleton, Yerramsetti, Gard, et al, 2011; Murakami et al., 2012). Furthermore, Zipp and Bryan (2016) confirmed mindfulness is used as a strategy in physical therapy in order to promote motor skill learning.

According to psychological distress, previous studies have shown that mindfulness-based intervention had an effect on reducing psychological symptoms and emotional disturbance (Keng et al., 2011; McCay, et al., 2016; Ostafin et al., 2006). Mindfulness has an effect on psychological distress by increasing emotion regulation and non-attachment, while decreasing rumination as a result; person had reduced negatively biased cognition, and decreased emotional distress finally (Kiken & Shook, 2012). Mindfulness increased gray matter volume in the right anterior insula which is associated with body and emotional awareness. The right anterior insula focused on subjective feelings from the body and emotional awareness then, consistent with the definition of the describing facet of the mindfulness (Craig, 2009). High describing facet of the mindfulness can encourage more awareness of emotional state and stressful state, hence the participants can control over their emotions. Hence, mindfulness enhances more awareness of emotional state and stressful state and awareness of body (Murakami, Nakao, Matsunaga, Kasuya, Shinoda, et al, 2012). Furthermore, mindfulness decreased activating in right amygdala, as a result, lower amygdala response to emotional stimuli. As the amygdala calms down, stressful implicit memories lose strength and adaptive memories are laid down through neural connections (Desbordes, Negi, Pace, Wallace, &

Raison, 2012). As a result, perceptual and information processing, learning, judgment and emotion are improved (Shonin & Van Gordon, 2016).

The mechanisms of mindfulness on spiritual well-being have been observed by alleviating the feeling of loneliness from life difficulty, understand broaden life perspective, and re-evaluate the priority of life. Mindfulness-based intervention lead person to glance the spiritual truths such as non-self (Shonin & Van Gordon, 2016). Previous evidences revealed that mindfulness has a positive effect on spiritual well-being. For instance, Garland and colleague compare the effects of 8- week mindfulness-based stress reduction (MBSR) and 6-week healing through the creative art (HA) of cancer patients. The study indicated spiritual well-being of participants in the MBSR group was significantly better improvement than that of participants in the HA group (Garland et al., 2007). Similar to another study by Birnie et al (2010) who explored the effects of mindfulness-based stress reduction (MBSR) on self - compassion and empathy, mindfulness, symptoms of stress, mood disturbance and spirituality among 51 participants in a community. There were significantly increased of mindfulness, spirituality and self-compassion after receiving the MBSR. One exploratory study had also supported that the mindfulness can increase the sense of intrapersonal, interpersonal, and transpersonal of patients with visual impairment, as a result, spiritual well-being is enhancing (Marques-Brocksopp, 2014).

To conclude, mindfulness-based interventions have affect to improve physical functioning, reduce psychological distress and promote spiritual well-being.

Rehabilitation Concept

Concept Definition

According to Mosby's Medical Dictionary (2009), rehabilitation is "a treatment or treatments designed to facilitate the process of recovery from injury, illness or disease to as normal a condition as possible"

Rehabilitation is a continuous process focused on the consequences of disease. According to the International Classification of Functioning, Disability and Health (ICF), rehabilitation process is described as a strategy that prevents further disability and reduces individual activity limitations together with participation restriction (WHO, 2002). This process consists of the following four steps: assessment, assignment, intervention and evaluation. The assessment step is a process by which health care providers identify the patient's problems related to ICF and including impairment, functional limitations and/or participation restriction. In addition, health care providers have to define treatment goals. In the assignment step, health care providers are assigned to involve intervention principles. Next, within the intervention step, specific intervention techniques are implemented within a set time period. Finally, the evaluation step refers to the assessment of the goal achievement in relation to treatment goals (WHO, 2013).

Rehabilitation is an important factor influencing the recovery process (Rouleau, Place, Berube, Laflamme, & Feldman, 2015). The concepts of rehabilitation are focused on the healing process and rehabilitation therapeutic modifiers to stimulate the structural and functional aspects of the injured parts. The healing process consists of

the following three phases: the acute injury phase, the repair phase and the remodeling phase (Pagorek, Noehren, & Malone, 2012; Prentice, 2007). The acute injury phase starts when injury occurs and can last for four days following an injury. The rehabilitation during this phase is to control swelling and manage pain by using the PRICE technique including Protection, Restricted activity, Ice, Compression and Elevation. The repair phase might begin at two days following injury and can last for several weeks. In this phase, inflammation is controlled and pain involves less active or passive motion. Soft tissue contractures and muscle weakness may develop during this phase. Rehabilitation exercises should be immediately applied in order to restore range of motion and increase muscle strength. The remodeling phase is the longest phase, depending on the severity of injury. Return to activity is defined as the ultimate goal of this phase (Pagorek, Noehren, & Malone, 2012; Prentice, 2007).

In lower extremity injury, rehabilitation is considered that is a one crucial factor which improve physical functioning after injury. Kanimozhi and Karupaaiah (2014) investigated the effectiveness of orthopedic rehabilitation on well-being of patients with lower limb fracture and found that orthopedic rehabilitation had a significant improvement in activities of daily living, mental well-being, spiritual well-being and social well-being. Although healing process and rehabilitation therapeutic were important for rehabilitation process, injury severity characteristics should be early identified. Rouleau et al (2015) described poly-trauma, bilateral lower limb injury, pelvic injury, femoral injury, upper limb and head injury had affected to disability after injury.

Summary of the Literature Review

In summary, the literature review in this study provides fundamental knowledge for the development of the mindfulness-based nursing rehabilitation program (MNRP). There are several factors influencing the outcomes of patients with lower extremity which the researcher should concern in developing program. The rehabilitation is the treatment that helped patients with lower extremity injury rapidly recover. However, the patients often present psycho-spiritual disturbance after the injury which could interrupt the process of rehabilitation. Thus, the intervention which reduce psycho-spiritual disturbance is crucial. Mindfulness was selected to adding and integrating with rehabilitation program. Several evidences have shown that mindfulness-based interventions have been found effective for reducing psychological disturbance in patients with traumatic injury and promoting motor learning process in the physical physiotherapy. Despite the above, rehabilitation integrating mindfulness intervention has never been explored to patients with lower extremity in Thailand. Therefore, it is crucial to conduct a study to evaluate the effect of rehabilitation integrating mindfulness intervention for improving physical functioning, reducing psychological distress, and promoting spiritual well-being among patients with lower extremity in Thailand.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter of the study describes research methodology consisting of research design, variables, setting, population, sample, instrumentation, intervention, ethical issues, data collection procedure, and data analyses.

Research Design

The randomized control trial, two-group pre – posttest, and repeated measures design was conducted to examine the effects of the MNRP on physical functioning, psychological distress, and spiritual well-being outcomes of Thai Buddhist patients with lower extremity injury. Observed variables included Physical functioning (muscle strength or MS and range of motion or ROM), psychological distress (BSI-18 or Brief symptom inventory-18), and spiritual well-being (SIWB or Spirituality index well-being) which were measured on the third day (T1), one month (T2), and three months (T3) after injury as shown in Figure 2

Group	T1	T2	T3
Control group	O1c ⟶	O2c ⟶	O3c
Experimental group	O1e ⟶ X ⟶	O2e ⟶ X ⟶	O3e

Figure 2 – Research Design of the Mindfulness-based Nursing Rehabilitation on physical functioning, psychological distress, and spiritual well-being

Note:

X refers to Mindfulness-based nursing rehabilitation program (MNRP)

O1c, O1e refers to the observes variables at baseline data (the third day after injury, T1) before MNRP intervention

O2c, O2e refers to the observes variables at one month after injury (T2) after MNRP intervention

O2c, O2e refers to the observes variables at three months after injury (T3) after MNRP intervention

Variables

The independent variable in this study was the MNRP for Thai Buddhist patients with lower extremity injury. The dependent variables were physical functioning, psychological distress, and spiritual well-being outcomes.

The confounding variables included location of injury, type of injury,

and time to operation. These variables were controlled by randomization because they may have an effect on the intervention process and study outcomes (Burns & Grove, 2005).

Research Setting

Female and male orthopedic wards, tertiary care hospital in the upper south of Thailand were intentionally selected for the study. The two wards had similar equipment and nursing intervention procedures. The nurse-to-patients ratio was 1:6-8 in the similar context of environment at both wards. Six orthopedists were working together with nurses.

The routine procedure of admitting patients with lower extremity injury in the orthopedic ward included patient's assessment such as vital signs, location of injury and type of fracture, and pre-operative assessment. Continuous immobilization such as skin traction, skeletal traction was usually given to all patients until cardiovascular system was stable and surgery was required. In case of surgery, post-operative care was implemented and rehabilitation care was started when vacuum drain was removed. Patients were transferred to department of physical therapy for training a home-based rehabilitation program before they were discharged from the hospital. Totally, length of hospital stay varied from 4 to 10 days.

Population and Sample

The target population of this study consisted of Thai Buddhists patient with lower extremity injury admitted to the female or male orthopedic ward, tertiary care hospital in the upper south of Thailand and meeting the inclusion criteria. Potential research recruits were approached and informed regarding the study. Written informed consent was obtained from those who agreed to participate.

Inclusion Criteria

Research candidates were eligible for the study if they were (1) Thai Buddhist patients aged between 18 and 40 years; (2) able to communicate and write in Thai; (3) had full-or part-time employment or education before injury; (4) ability to ambulate before injury; (5) had no evidence of pre-injury psychiatric disorders; and (6) medically diagnosed with a unilateral lower extremity injury and receiving an orthopedic surgery who required a home rehabilitation program.

Exclusion Criteria

The exclusion criteria was Thai Buddhist patients with lower extremity injury who had (1) an evidence of head trauma and a Glasgow Coma Score (GCS) of less than 15; and (2) an evidence of cognitive impairment.

Sample Size Estimation

The appropriate sample size calculation was based on the power analysis for experimental research. According to previous studies, Jain and colleagues (2007) used an experimental, three groups, pretest- posttest design to examine the effects of a 1-month mindfulness meditation versus somatic relaxation training and control group for reducing distress, ruminative, distraction and improving positive states of mind in 83 students in premedical or pre-health studies. The effect size calculated for distress was medium effect size. In this study, the mean differences of dependent variables were tested. To achieve a power of 0.80 at an alpha of 0.05, and N for large population effect size was 64 (Table 2) (Cohen, 1992 p.158). In this study, however, the researcher prevented participant attrition due to a dropout rate by adding 5% to the estimated sample size, because the intervention in this study was conducted over a long-term period (12 weeks) compared to a previous study (4 weeks) (Jain et al., 2007). Therefore, the number of research participants required for this new study was 70 (35 subjects per group). However, between August 2015 and August 2016, 1,040 patients with lower extremity injuries were admitted to the orthopedic ward, tertiary care hospital. Only 98 patients who had undergone orthopedic surgery who were approached, 9 refused to participate due to lack of interest, 7 did not complete the initial assessment and 5 were transferred to private wards. Among the remaining 77 participants, 43 did not meet the inclusion criteria: 8 participants had bilateral lower extremity injury, 14 had multiple injuries, 12 had head injuries and Glasgow Coma Scores (GCS) of less than 13 points, and 9 were Muslims. Hence, this study finally had 34 participants.

Random Assignment

The eligible participants were randomly assigned to either the experimental group or the control group by using the minimized randomization software version 2.01 (Zeller, 1997). After giving consent and collecting data at baseline, data on location of injury, type of injury, and time to operation were entered into minimized randomization software version 2.01 to determine the placement of the participants. The minimized randomization software help to control variables affecting physical functioning, psychological distress, and spiritual well-being.

Instrumentation

The instruments used in this study were classified into two categories including (1) instruments for research procedure, and (2) instruments for data collection. Instruments developed in the English language were translated using the back translation technique, followed by content validity and testing their reliability. Details of the instrument process are as follow:

1) Instruments for Research Procedure

1.1 The Nursing Manual, pamphlet and DVD of the Mindfulness-based nursing rehabilitation program (MNRP) for Thai Buddhist patients with lower extremity injuries. The MNRP composes of three activities as follow:

1. Health education regarding lower extremity injury, wound healing process, and self-care for improving bone healing process include:

(1) Lower extremity injury and bone healing process

(2) Self-care for promoting bone healing process

- Nutrition for promoting bone healing process

- Home medication

- Wound care

- Exercise program

- Use of crutches/walker

2. Luangpor Teean's awareness- mindfulness meditation was developed by Luangpor Teean Jittasubho (1957) described fourteen steps of cultivation self-awareness: (1) Rest the hand palm down on the thighs and turn the right hand onto its edge, be aware; do it slowly, then stop; (2) Raise the right hand to rest on the abdomen, be aware, and then stop; (3) Lower the right hand to rest on the abdomen, be aware, and then stop; (4) Turn the left hand onto its edge, be aware, and then stop; (5) Raise the left hand up, be aware, and then stop; (6) Lower the left hand to rest on the right hand, be aware, and then stop; (7) Move the right hand up to rest on the chest, be aware, and then stop; (8) Move the right hand out, be aware, and then stop; (19) Lower the right hand onto its edge on the tight, be aware, and then stop; (10) Face the right palm down, be aware, and then stop; (11) Move the left hand up to rest on the chest, be aware, and then stop; (12) Move the left hand out, be aware, and then stop; (13) Lower the left hand onto its edge on the thigh, be aware, and then stop; (14) Face the left palm down, be aware, and then stop.

3. Exercise program integrating mindfulness -based teaching

Exercise program integrating mindfulness -based teaching consisted of

10 activities including (1) Mindfulness -based teaching and Gluteal muscle exercise 1; (2) Mindfulness -based teaching and Gluteal muscle exercise 2; (3) Mindfulness -based teaching and Gluteal muscle exercise 3; (4) Mindfulness -based teaching and knee extension and knee flexion muscle exercise 1; (5) Mindfulness -based teaching and knee extension and knee flexion muscle exercise 2; (6) Mindfulness -based teaching and ankle joint exercise 1; (7) Mindfulness -based teaching and ankle joint exercise 2; (8) Mindfulness -based teaching and standing/walking with crutches; (9) Mindfulness -based teaching and walking up stairs with crutches; and (10) Mindfulness -based teaching and walking down stairs with crutches (Appendix C).

2) Instruments for Data Collection

The instruments used for data collection were composed of the following: (1) Demographic Data Questionnaire (DDQ); (2) Physical functioning which consisted of two components, Muscle strength (MS) of the quadriceps muscle and Passive Range of motion (PROM) of the hip and knee joints; (3) Psychological distress using Brief Symptom Inventory-18 (BSI-18); and (4) Spirituality well-being using Spirituality Index Well-Being (SIWB).

(1) Demographic Data Questionnaire (DDQ)

The DDQ was obtained from the research participants' interviews and medical records. It contained closed-ended or dichotomous questions designed by the researcher to collect demographic, socioeconomic and injury characteristics. The DDQ contained two sections. The first section included items on age, gender, education level, occupation and income. The second section collected information

related to injury characteristics such as location, sides and type of fracture, pain score at baseline and length of hospital stay (LOS).

(2) Physical functioning. It consisted of two components.

2.1 Muscle strength (MS) of the quadriceps

Muscle strength was assessed by manual muscle testing (MMT). MMT was developed by Wright and Lovett (1912) as a mean of testing and grading muscle strength based on gravity and manually applied resistance. In the MMT, the Medical Research Council (MRC) scale is an ordinal scale frequently used to detect the magnitude of strength by grading muscle strength from 0 (zero) to 5 (normal). Grade 5 describes full available ROM is achieved against gravity and is able to demonstrate maximum resistance. Grade 4 indicates full available ROM is achieved against gravity and is able to demonstrate moderate resistance. Grade 3 presents full available ROM is achieved against gravity and is not able to demonstrate resistance. Grade 2 indicates full available ROM is achieved only with gravity eliminated. Grade 1 describes a visible or palpable contraction is noted, with no joint movement. Grade 0 identifies no contraction. Grade of 0 to 2 represent gravity-minimized position, and grade of 3 to 5 show increasing degrees of resistance applied as an isometric hold at the end of the test range (O' Dell, Lin, Singh, & Christolias, 2016; Write, 2014).

2.2 Passive Range of motion (ROM) for the hip and knee joints

In the clinical setting, PROM is measures with universal goniometer (White, 2014). In this study, hip flexion, hip extension, and knee flexion were used to evaluate physical functioning after lower extremity injury.

Hip flexion relates to many muscles including Iliacus, Psoas, Tensor fascla lata, Rectus femoris, Pectineus, and Adductor longus, brevis, anterior portion of magnus. Hip flexion can be measured with the patients in a seated or supine position. Patients with lower extremity injury cannot in the sitting position, therefore the research assistant forces the hip into extension, applying force over the distal anterior thigh. Normal PROM of hip flexion is 0 to 120 degrees. Hip extension associates with Gluteus maximus muscle. Hip extension can be tested with the patient in a prone position. The hip is extended with the knee flexed to 90 degrees. The research assistant attempts to flex the hip, applying force over the distal posterior thigh. Normal PROM of hip flexion is 0 to 30 degrees. Knee flexion relates to many muscles such as Semitendinosus, Semimembranosus, and Biceps femoris. The knee is flexed at 90 degrees in the prone position. The research assistant attempts to extend the leg, applying pressure over the posterior tibia surface. Normal PROM of hip flexion is 0 to 135 degrees (O' Dell et al, 2016).

(3) Psychological distress using Brief Symptom Inventory-18 (BSI-18)

The BSI-18 is the briefest and latest version in a series of instruments designed by Derogatis (2000). It is a widely used self-report questionnaire that measures general psychological distress. The BSI-18 consists of the three six-item scales somatization, anxiety, depression, and the global scale Global Severity Index (GSI). The BSI-18 scale is a 5-point Likert-like scale which measured with the score of 0 = not at all, 1 = sometimes, 2 = often, 3 = almost always, and 4 = extremely. Six items on the BSI-18 scale, i.e. item no.1, 4, 7, 10, 13, and 16 measures the presence of somatization. Six items on the BSI-18 scale, i.e. item no. 2, 5, 8, 11, 14, and 17

measures the presence of depression. Another six items on the BSI-18 scale, i.e. item no. 3, 6, 9, 12, 15, and 18 measures the presence of anxiety. The BSI-18 scores were calculated by sum scores. The sum or total score (GSI) of three parts of BSI-18 was ranged between 0-72. Higher score indicates more psychological distress.

(4) Spiritual well-being using Spirituality Index of Well-Being (SIWB)

The SIWB, developed by Daaleman and Frey (2004) consisted of 12 items with 6 self-efficacy and life scheme subscales each aimed to measure a dimension of spirituality linked to participants' well-being. The SIWB is a 5-point Likert-like scale which measured with the score of 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree. Six items on the SIWB scale, i.e. item no.1-6 measures the self-efficacy subscale. Item no. 7- 12 measures the life-scheme subscale. The SIWB scores were calculated by sum scores. The score ranges between 12 and 60. Higher score indicates more spiritual well-being.

Translation of Instruments

The BSI-18 and SIWB were translated using the back translation method. This method consisted of three phases. Firstly, The English version questionnaire was translated into Thai language by a bilingual translator to check its cultural relevance with the local context. Secondly, the Thai version was translated back into English by two bilingual translators. Thirdly, the original questionnaire and the English back-translated questionnaire were evaluated by English expert for discrepancies (Beauford, Nagashima, & Wu, 2009; Maneesriwongul & Dixon, 2004).

Validity and reliability

Validity. Five experts evaluated the content validity of all instruments in Thai version namely the Nursing Manual, pamphlet and DVD of the MNRP. The panel of experts included one nurse with expertise and experience in orthopedic injuries, one monk who was an expert in Luang Por Teean's awareness-mindfulness meditation, and completed Ph.D program. Another three experts were educators who were working in the following: (1) Buddhist-based mindfulness practice; (2) psycho-spiritual aspect and (3) physiotherapy and home rehabilitation. The experts validated the accuracy, language, and cultural appropriateness of the Nursing Manual, pamphlet and DVD of the MNRP, the muscle strength of quadriceps, passive range of motion (PROM) for the hip and knee joints, the BSI-18, and the SIWB. The researcher revised the Nursing Manual, pamphlet and DVD of the MNRP based on the comments and suggestions of the experts. The researcher conducted a pilot study to ensure the feasibility of the Nursing Manual, pamphlet and DVD of the MNRP in clinical setting.

Reliability. The reliability of the questionnaires was reported using Cronbach's alpha coefficient for the BSI-18 and the SIWB. The scale was tested for the reliability in 30 patients with lower extremity injury. The Cronbach's alpha coefficient for the BSI-18 was .87, and for the SIWB was .86. The Cronbach's alpha coefficient values between .81 and .9 are acceptable (Fisher, 2007).

Inter-rater reliability refers to degree of agreement between two or

more examiners. In this study used only one physiotherapist to measure muscle strength and PROM of hip and knee joint at three times period. Therefore, inter-rater reliability was not conducted.

Ethical consideration

This study was conducted after obtaining permission from the Research Ethical Committee, Faculty of Nursing, Prince of Songkla University and the Ethical Committee Review Board of the tertiary care hospital in the upper south of Thailand. The researcher approached eligible research participants and offered explanations related to the study such as the purpose of the study, research process, expected outcomes, timeframe, potential risks and benefits for the participants and the participants' right to participate or withdraw from the study. The research participants were given time to ask questions and make decisions about whether or not to participate in the program. Moreover, the researcher explained to the research participants that the confidentiality of all data would be maintained and that they had the freedom to withdraw from the study at any time without any impact on the benefits and services they would receive from the orthopedic ward, orthopedic clinic, or other health care centers.

Data Collection Procedure

Data collection included the preparation phase and the intervention phase. Preparation phase included seeking permission from head nurses, recruitment of research assistants, and recruited of research participants. Intervention phase followed the experimental protocol.

Preparation Phase

1. after obtaining permission from the Ethical Committee Review Board of the tertiary care hospital in the upper south of Thailand. The researcher recruited research assistants, one was earning the Bachelor degree of Nursing and another was earning the Bachelor degree of Physiotherapy.

2. The research assistants were explained regarding the research study, the research participant's recruitment, and the process of data collection. In addition, they were explained how to administrate the Demographic data questionnaire, the muscle strength of quadriceps muscle, the range of motion of hip and knee joints, the Brief symptom inventory-18, and the Spirituality index well-being at the time points in the experimental and control group.

3. A pilot study was conducted on 5 Thai Buddhist patients with lower extremity injury in order to determine if this program fitted with the participants and identify any problems confronted during the data collection process. The Thai Buddhist patients with lower extremity injury participating in the pilot study were not

included in the sample for the main study. The MNRP was feasible to conduct without any revision after the pilot test.

Intervention Phase

The data collection for the outcomes was carried out at the following three time points: 1) on the third days after injury; 2) at the 1month after injury; and 3) at the 3 months after injury.

At the third day after injury, the experimental group were assessed for physical functioning by using MS of Quadriceps muscle , and PROM of the hip and knee joints. Psychological distress was evaluated by using the BSI-18, and spiritual well-being was then evaluated by using the SIWB. MNRP was started on the same day by the researcher. Explanations about fractures, bone healing process and time of recovery and Luang Por Teean's awareness-mindfulness meditation were delivered to the experimental group using the DVD of MNRP. The participants practiced following the DVD under the researcher supervision to ensure of their ability to practice by themselves.

Three to five days post-operation, the vacuum drain was removed and participants were transferred to the Department of Physical Therapy for training in a home-based rehabilitation program. Exercise program integrating mindfulness -based teaching (the third part of MNRP) was encouraged to perform continuously until the patients were discharged from hospital. To ensure patients' practice of the MNRP at home and evaluate the barriers at the first week post discharge, the participants were contact by telephone. Muscle strength of Quadriceps muscle, PROM of the hip and

knee joints, BSI-18, and SIWB were evaluated again at one month and 3 months after injury at the participant's home.

In the control group, the participants received the usual care. The similar data collection procedures were performed by research assistants. The data on muscle strength of Quadriceps muscle, PROM of the hip and knee joints, BSI-18, and SIWB were collected at the third day, 1 and 3 months after injury. At the end, the researcher provided the control group the same pamphlet and DVD of the MNRP used by those in the experimental group. In this study, the recruitment and process of data collection was demonstrated in the Figure 3.

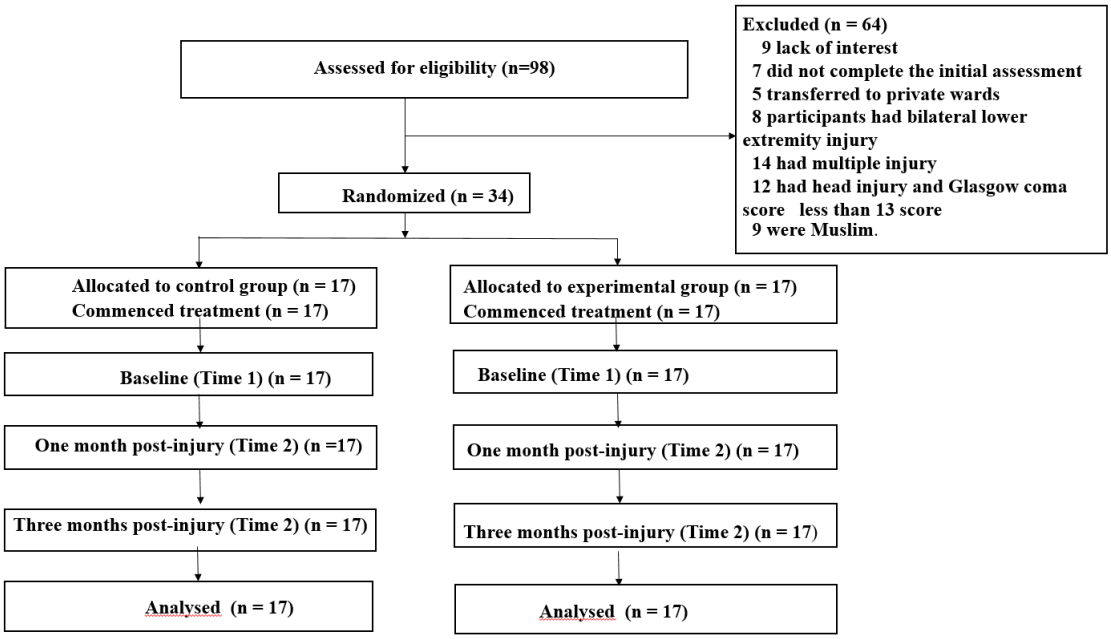

Figure 3 - The Process of Data Collection in the experimental and control group

Data Analysis

Data screening and cleaning

After receiving the questionnaires, the research assistants reviewed each questionnaire immediately to check for any missing data. The research participants in both groups were asked to complete the items of the scale. While the research participants were completing the questionnaires, the research assistants were available to clarify any questions the participants might have. The researcher performed all data management procedures, including identifying and correcting errors, coding, data entry and data cleaning. The researcher checked all data and errors before entering coded into computer files to create a data set. Data were initially screened for input errors, missing data and normality. Descriptive statistics, frequency, percentage, mean and standard deviation were used to analyze the socio-demographic and injury characteristic data.

Preliminary data analysis

In this study, profile analysis was conducted to test intervention (MNRP) effect on physical functioning outcomes. Profile analysis is an application of the multivariate equivalent of variance (MANOVA) in order to compare the same dependent variables between groups over several time-points and there were several measures of the same dependent variable (Tabachnick & Fidell, 2001). The dependent variables were physical functioning outcomes compared at three time points (baseline,

1 month, and 3 months after injury) between the experimental and control groups, and measured by muscle strength, PROM of hip flexion, hip extension and knee flexion. The independent variable was group assignment (experimental and control groups). The major test of profile analysis are parallelism and flatness. The parallelism is the main test of interest in profile analysis which is tested of interaction. The flatness test evaluates the equivalent to the within-subjects main effect. The assumptions for profile analysis included the following: (1) sample size in each group; (2) Multivariate normality; (3) Absence of outliers; (4) Homogeneity of Variance-Covariance matrices; (5) Linearity; and (6) Absence of multicollinearity and singularity (Tabachnick & Fidell, 2001). The assumptions for the profile analysis were tested before further analysis.

As long as the sample sizes are equal, Homogeneity of Variance-Covariance matrices is usually not an issue. In this study, the sample size of the experimental and control groups were 17 in each group and larger than the number of dependent variable. Although significance test of MANOVA is based on multivariate normal distribution, profile analysis is as robust to violation of normality. The deviation from linearity was greater than .05, thus, there was a linear relationship (Field, 2009). It can be concluded that normality assumption was met and profile analysis was then used for statistical analysis.

The Mauchly's test of sphericity was significant ($p < .05$). It also indicated a violation of sphericity assumption. Therefore, the researcher used the multivariate table to see the Wilk"s lambda value. Mauchly's test of sphericity cannot be assumed; hence, Huynh-Feldt correction was used to determine whether or not the effects are significant because "Girden (1992 as cited in Field, 2009, p.461) recommended that when estimates of sphericity (ε) are greater than 0.75 then the Huynh-

Feldt correction should be used, but when sphericity estimate (ε) are less than 0.75, the Greenhouse-Geisser correction should be used".

Univariate assumptions of dependent variable data were analyzed for normality and homogeneity of variance. Histogram, skewness, kurtosis, stem and leaf plot, normality plot were performed to test normality. For skewness and kurtosis, some data showed skewness with magnitude of greater than 3 and kurtosis with magnitude of greater than 10 (Kline, 2011, p.63). Transformation was performed by square root and log-10 in order to achieve normality. As most of the transformed data of psychological distress and spiritual well-being outcomes did not meet normality assumption, non-parametric statistics were used for statistical analysis.

Descriptive analysis

Descriptive statistics were used to analyze demographic variables. Age, length of hospital stay, pain score on the third day after injury were analyzed for mean and standard deviation. The categorical data were present by frequency and percentage including gender, education, occupation, income, location of fracture, side of injury, and type of fracture.

Inferential data analysis

Parametric test included profile analysis was used for physical functioning while non-parametric test was used for psychological distress and spiritual well-being due to the data did not meet assumption of normality. The

repeated measures Friedman test, Wilcoxon signed-rank test, and Mann Whitney U test were used for non-parametric test. The hypotheses were tested as follow:

Test of Hypothesis 1. Profile analysis was conducted to test the intervention effects on physical functioning (muscle strength of Quadriceps muscle, and PROM of the hip and knee joints) at the third day (baseline), 1 month and 3 months after injury within the experimental group.

Test of Hypothesis 2. Profile analysis was conducted to test the intervention effects on physical functioning (muscle strength of Quadriceps muscle, and PROM of the hip and knee joints) at 1 month and 3 months after injury between the experimental and control group.

Test of Hypothesis 3. Repeated measures Friedman test was used for testing the differences in median of psychological distress (BSI-18) at baseline, 1 month and 3 months after injury within the experimental group.

Test of Hypothesis 4. Mann Whitney U test was used to compare the median score of psychological distress (BSI-18) at 1 month and 3 months after injury between the experimental and control group.

Test of Hypothesis 5. Repeated measures Friedman test was used for testing the differences in median of spiritual well-being (SIWB) at baseline, 1 month and 3 months after injury within the experimental group.

Test of Hypothesis 6. Mann Whitney U test was used to compare the median score of spiritual well-being at 1 month and 3 months after injury between the experimental and control group.

Strategies to Minimize Threats to Internal Validity

This study was a randomized controlled trial, two groups, and repeated measures design using the intention-to treat analysis to minimize the threats to internal validity (Armijo-Olivo, Warren, & Magee, 2009; Polit & Gillespie, 2010). The possible confounding variables including location of injury, type of injury, and time to operation were controlled by the minimized randomization software version 2.01 (Zeller, 1997). In this study, the researcher asked for the telephone numbers of the research participants and their caregivers who included parents, spouses, offspring and friends. Furthermore, the researcher requested addresses and maps to the patients' homes. Thus, there was no withdrawal or loss in follow-up in this study. To achieve the intention-to-treat (ITT) principle, participants were recruited at randomization and all data were accounted for the ITT (n = 34)

CHAPTER 4

RESULTS AND DISCUSSION

The results of the study on the effects of mindfulness-based nursing rehabilitation program (MNRP) on physical functioning, psychological distress, and spiritual well-being of lower extremity injured patients are presented in this chapter. The sample profile, study variables, hypotheses testing and statistical significance versus clinical significance are organized and demonstrated.

Sample Profile

Demographic and Socioeconomic Data

Thirty-four participants were randomly assigned to the experimental (n = 17) and control (n = 17) groups. Most of the participants in each group were males with a mean age of approximately 26 years. Most of the participants in the experimental group had completed secondary school, while the other group had completed primary school. Type of occupations in the experimental group was related to non-office work, whereas those in the control group were related to in-office work (office man). Most participants in both groups had earned income more than 100,000 Baht/Year. However, there were no significant differences of demographic data in both groups ($p > 0.05$) as shown in Table 1.

Table 1

Comparison of Demographic Characteristics between the Experimental and Control Groups (N = 34)

Characteristics	Experimental Group		Control Group		Statistical value	df	p-value
	Number	%	Number	%			
Age	M = 26.24, SD = 7.538		M = 26.12, SD = 7.753		-.045[a]	32	.964
Gender					.515[b]	1	.473
Female	7	41.2	5	29.4			
Male	10	58.8	12	70.6			
Education					5.643[b]	5	.343
Primary school	4	23.5	6	35.3			
Secondary school	6	35.3	5	29.4			
Diploma	3	17.6	3	17.6			
Bachelor's degree	4	23.5	3	17.6			
Occupational type					3.556[b]	6	.737
Office work	6	35.3	10	58.8			
Non office work	11	64.7	7	41.2			
Income					3.967[b]	6	.681
< 30,000 Baht/Year	3	17.6	4	23.5			
30,000 – 100,000 Baht/Year	7	41.2	5	29.4			
> 100,000 Baht/Year	7	41.2	8	47.1			

Note. [a] = independent T-Test, [b] = Chi-square

In terms of the nature of their injuries, most participants in both groups had fractures of the femur and diagnosed as the closed fracture type. All of the participants were more frequently injured on the right side than the left side of extremity. In addition, pain scores at baseline (about 6) and length of hospital stay (about 9 days) in both groups were similar. There were no significant differences in the control variables of injury regarding site of injury, type of fracture, length of hospitalization and pain scores at baseline between the two groups ($p > 0.05$) as shown in Table 2.

Table 2

Comparison of Injury Characteristics between the Experimental and Control Group (N = 34)

Characteristics	Experimental Group		Control Group		Test of value	df	p-value
	Number	%	Number	%			
Injury					2.377[b]	4	.667
Fractured femur	12	70.6	11	64.7			
Fractured pelvis	-	-	1	5.9			
Fractured tibia	2	11.8	1	5.9			
Fractured both bones	3	17.6	3	17.6			
Fractured patella	-	-	1	5.9			
Site of injury					.471[b]	1	.493
Right	9	52.9	10	58.8			
Left	8	47.1	7	41.2			

Note: [a] = independent T-Test, [b] = Chi-square

Table 2 (continued)

Characteristics	Experimental Group		Control Group		Test of value	df	p-value
	Number	%	Number	%			
Type of fracture					.234[b]	1	.628
Closed fracture	14	82.4	15	88.2			
Open fracture	3	17.6	2	11.8			
Length of hospital stay	M = 9.29		M = 9.82		.301[a]	32	.765
	SD = 4.921		SD = 5.318				
Pain score at baseline	M = 6.47		M = 6.59		.126[a]	32	.901
	SD = 3.011		SD = 2.373				

Note: [a] = independent T-Test, [b] = Chi-square

Hypotheses Testing

Hypothesis 1: The mean score of physical functioning (using MS and PROM) at 1 and 3 months after injury in the experimental group would be higher than that of baseline. The means and standard deviations for MS, PROM of hip flexion, PROM of hip extension and PROM of knee flexion for both groups are presented in Table 3. By using t-test, there were no significant differences of physical functioning at baseline ($p > 0.05$).

Table 3

Comparison of Physical Functioning Outcomes at Baseline between the Experimental and Control Groups (N = 34)

Data Points	Experimental Group (n = 17)		Control Group (n = 17)		t
	M	SD	M	SD	
Muscle strength	3.18	.125	3.00	.125	-1.000
PROM of hip flexion	46.35	4.788	44.77	4.788	-.235
PROM of hip extension	2.41	1.213	1.53	1.213	-.514
PROM of knee flexion	44.71	5.123	44.00	5.123	-.097

Note. * $p < 0.05$, PROM = passive range of motion

The within subject test indicated that the main effect of time was significant, F (8, 122) = 46.96, p = .000, Wilks' Lambda = .060, partial η^2 = .755, but the interaction of time and group was not significant, F (8, 122) = 1.754, p = .093, Wilks' Lambda = .804, partial η^2 = .103. Univariate testing showed significant differences in the main effects of muscle strength (F (2, 64) = 120.388, p = .000 and partial (η^2 = .790), main effect of PROM of hip flexion (F (2, 64) = 177.339, p = .000, and partial (η^2 = .847), the main effects of PROM of hip extension (F (1.684, 54.513) = 176.477, p = .000, and partial (η^2 = .847) and the main effects of PROM of knee flexion (F (1.704, 54.513) =

246.944, p = .000, and partial (η^2 = .885) as shown in Table 4. In conclusion, profile analysis and univariate testing demonstrated that there were significant differences in the mean scores for physical functioning (MS, PROM for hip flexion, hip extension, and knee flexion) across the three time points from baseline to 1and 3 months after injury in the experimental group. Thus, Hypothesis 1 was confirmed.

Hypothesis 2: The mean score for of physical functioning of the experimental group would be higher than that of the control group at 1, and 3 months after injury.

The profile analysis demonstrated that there were significant differences in the mean scores for muscle strength (p = .011) and PROM of knee flexion (.017) as shown in Table 4. Thus, it can be concluded that the participants in the experimental group had more functioning outcomes (muscle strength and PROM of knee flexion) at all-time points than the participants in the control group. The plot profile of the muscle strength, PROM of hip flexion, hip extension and knee flexion were demonstrated in Figure 4 - 7. The interaction of time and group was not significant (p >.05), except for the interaction of time and group for PROM of knee flexion (p < .05). The significant interaction indicates that the PROM of knee flexion changed over time, but in different ways. Figure 7 showed that the lines were not parallel slightly. Therefore, hypothesis 2 was partially supported.

Table 4

Profile analysis of physical functioning outcomes (N=34)

Source of Variation	SS	df	MS	F	η2	Power
Between-Subject Effects						
Muscle strength						
Group	5.186	1	5.186	7.197*	.184	.739
Residual	23.059	32	.721			
ROM of hip flexion						
Group	1061.186	1	1061.186	2.213	.065	.303
Residual	15341.490	32	479.422			
ROM of hip extension						
Group	116.480	1	116.480	4.044	.112	.496
Residual	921.647	32	28.801			
ROM of knee flexion						
Group	4270.588	1	4270.588	6.310*	.165	.683
Residual	21658.235	32	676.820			

Note. * $p < 0.05$

Table 4 (continued)

Source of Variation	SS	df	MS	F	η2	Power
Within-Subject Effects						
Muscle strength						
Time	45.588	2.000	22.794	120.388*	.790	1.000
Time x Group	.961	2.000	.480	2.537	.073	.490
Residual	12.118	64.000	.189			
ROM of hip flexion						
Time	74404.471	2.000	37202.235	177.339*	.847	1.000
Time x Group	395.608	2.000	197.804	.943	.029	.207
Residual	13425.922	64.000	209.780			
ROM of hip extension						
Time	3661.255	1.684	2173.679	176.477*	.847	1.000
Time x Group	22.196	1.684	13.178	1.070	.032	.212
Residual	663.882	53.899	12.317			
ROM of knee flexion						
Time	114670.824	1.704	67313.172	246.944*	.885	1.000
Time x Group	1909.647	1.704	1120.986	4.112*	.114	.657
Residual	14859.529	54.513	272.585			

Note. * $p < 0.05$

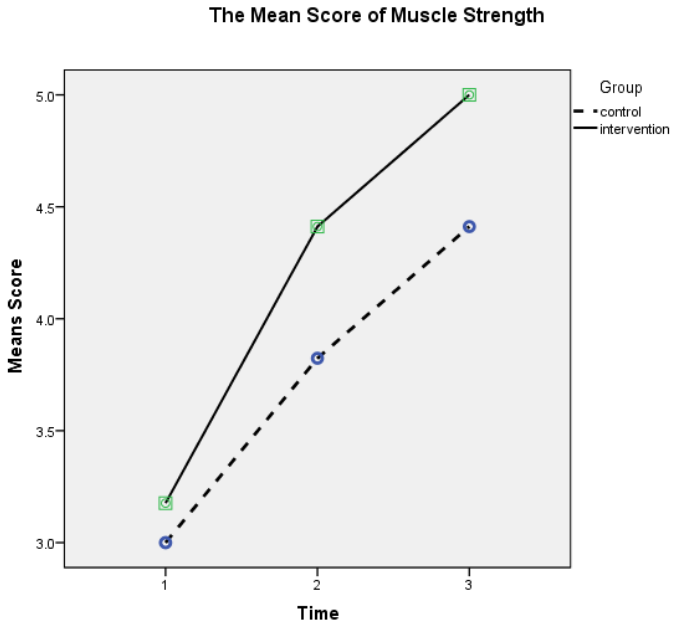

Figure 4 – Mean score of muscle strength at each of the three data points in both groups.

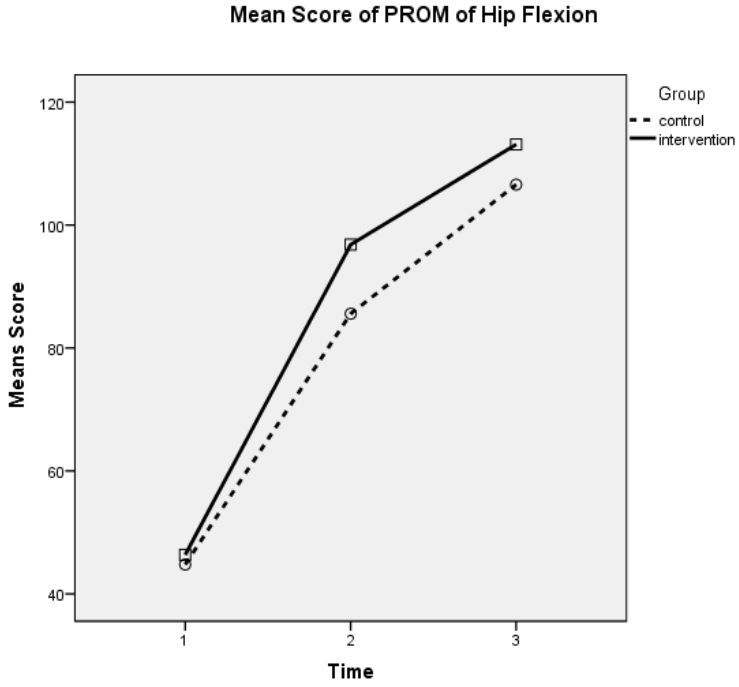

Figure 5 –Mean values of PROM for hip flexion at each of the three data points in both groups.

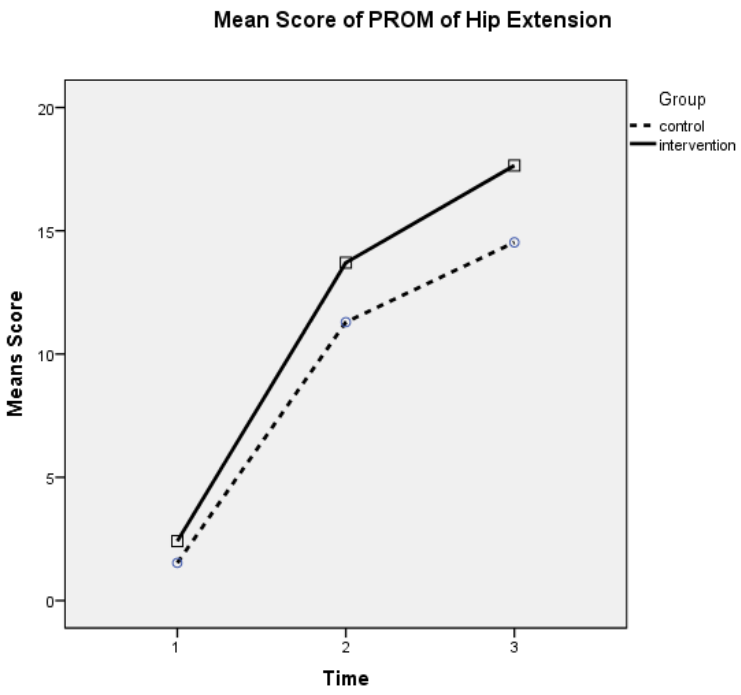

Figure 6 – Mean values of PROM for hip extension at each of the three data points in both groups.

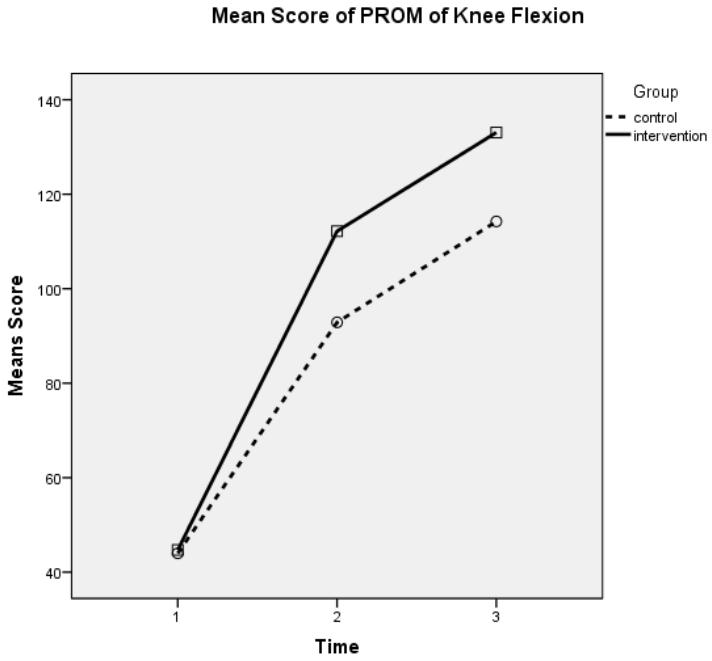

Figure 7 – Mean values of PROM for knee flexion at each of the three data points in both groups

Hypothesis 3: The median score of psychological distress at 1 and 3 months after injury in the experimental group would be lower than baseline. Table 5 showed that there was a statistically significant difference in reducing psychological distress at 1 and 3 months after injury, χ^2 (2) = 27.226, p = .000. Post-hoc analysis with Wilcoxon signed-rank test was conducted using a Bonferroni correction, resulting in a significance level set at p < 0.017. Median (BSI-18) psychological distress level for baseline, 1 month and 3 months after injury were 9 (5 to 13.5), 5 (2.5 to 9), and 2 (1-5), respectively. There were significant differences of psychological distress between baseline and 1 month after injury (Z = -2.850, p = .004), between baseline and 3 month after injury (Z = -3.521, p = .000), and between 1 month and 3 months after injury (Z = -3.314, p = .001). Therefore, Hypothesis 3 was supported.

Table 5

Comparison the Differences in Medians of Psychological distress at Different Time Poinst within the Experimental group

Psychological distress	Experimental group n = 17			Wilcoxon Signed Ranks test
	DMdn	MR	SR	
Baseline -1 month after injury	4.00	6.50	13.00	-2.850*
Baseline - 3months after injury	7.00	.00	.00	-3.521**
1 month after injury-3months after injury	3.00	.00	.00	-3.314*

Note. DMdn = Difference in median; MR = Mean rank; SR = Sum of rank
*p < .05. **p < .001

Hypothesis 4: The median score of psychological distress in the experimental group would be lower than that of the control group at 1, and 3 months after injury.

Mann-Whitney U test was conducted to evaluate Hypothesis 4, Table 6 showed that the psychological distress in the experimental group were lower than those of the control group at 1 month after injury (U (2) = 83.5, Z = - 2.109, p = .035), and 3 months after injury (U (2) = 48, Z = -3.344, p = .001). Therefore, hypothesis 4 was confirmed.

Table 6

Comparison the Median of Psychological Distress at Baseline, 1 Month, and 3 Months after Injury between Experimental and Control Group

Psychological distress	Experimental group n = 17			Control group n = 17			Mann-Whitney U Test
	Mdn	MR	SR	Mdn	MR	SR	
T1	9.00	18.00	306.00	9.00	17.00	289.00	136
T2	5.00	13.91	236.50	7.00	21.09	358.50	83.5*
T3	2.00	11.82	201.00	7.00	23.18	394.00	48*

Note. Mdn = Median; MR = Mean rank; SR = Sum of rank; T1 = baseline, T2 = 1 month after injury, T3 = 3 months after injury
* $p < 0.05$

Hypothesis 5: The median score of spiritual well-being at 1 and 3 months after injury in the experimental group were higher compared to baseline. There was a statistically significant difference in spiritual well-being from baseline to 1 and 3 months after injury, χ^2 (2) = 25.270, p = .000. Post-hoc analysis with Wilcoxon signed-rank test was conducted using a Bonferroni correction, resulting in a significance level set at $p < 0.017$. Median score of spiritual well-being level (SIWB) for baseline, 1 month and 3 months after injury were 49 (45 to 51), 50 (47.5 to 56), and 54 (51 to 58), respectively. There were significant differences of spiritual well-being between baseline and 1 month after injury (Z = -2.853, p = .004), between baseline and 3 months after injury (Z = -3.524, p = .000), and between 1 month and 3 months after injury (Z = -3.302, p = .001) (Table 7). To sum up, the median scores of spiritual well-being at 1 and 3 months after injury in the experimental group were higher from baseline. Therefore, Hypothesis 5 was supported.

Table 7

Comparison the Differences in Medians of Spiritual Well-being at Different Time Points within the Experimental Group

Spiritual well-being	Experimental group n = 17			Wilcoxon Signed Ranks test
	DMdn	MR	SR	
Baseline -1 month after injury	2.00	9.46	123.00	-2.853*
Baseline - 3months after injury	5.00	8.50	136.00	-3.524**
1 month after injury-3months after injury	4.00	7.50	105.00	-3.302*

Note. DMdn = Difference in median; MR = Mean rank; SR = Sum of rank
*p < .05. **p < .001

Hypothesis 6: The median score of spiritual well-being in the experimental group would be higher than that of the control group at 1, and 3 months after injury. Mann-Whitney U test was conducted to evaluate Hypothesis 6, Table 8 showed that median score of spiritual well-being in the experimental group were lower than those of the control group at 1 month after injury (U (2) = 84.5, Z = -2.072, p = .038), and 3 months after injury (U (2) = 72, Z = -2.512, p = .012). Therefore, hypothesis 6 was confirmed.

Table 8

Comparison of the Median of Spiritual Well-being at Baseline, 1 Month, and 3 Months after Injury between Experimental and Control Group

Spiritual Well-being	Experimental group n = 17			Control group n = 17			Mann-Whitney U Test
	Mdn	MR	SR	Mdn	MR	SR	
Baseline	49.00	16.91	287.50	48.00	18.09	307.50	135
1 month after injury	50.00	21.03	357.50	47.00	13.97	237.50	85*
3 months after injury	54.00	21.76	370.00	50.00	13.24	225.00	72*

Note. * $p < 0.05$

In summary of overall findings, the MNRP has significantly improved physical functioning and spiritual well-being, also reduced psychological distress overtime in the experimental group. When compared between groups, the experimental group significantly improved physical functioning (in terms of muscle strength and PROM of knee flexion), and spiritual well-being, also reduced psychological distress over the control group.

Discussion

The results of the study were discussed in line with the research hypotheses and compared with previous studies. Buddhist philosophy, Roy's Adaptation Model and rehabilitation concepts were addressed in the discussion.

Regarding hypotheses 1 and 2, it was shown that the MNRP significantly improved physical functioning at 1 and 3 months after injury in the experimental group. The results also showed that the physical functioning in the experimental group (after receiving MNRP) was higher or better improvement than that of the control group at 1, and 3 months after injury.

Healing time frames comprised of three phases including inflammatory, repair and remodeling phase (Pagorek et al., 2012; Prentice, 2007). The repair phase might begin at three days after injury and can last approximately 2 weeks. In this phase, soft tissue contractures and muscle weakness may occur (Kalfas, 2001; Pagorek et al., 2012; Prentice, 2007). Thus, starting the MNRP on the third day after injury is appropriate time to restore range of motion and increase muscle strength.

The experimental group had increased their physical functioning more than the control group. This is consistent with a retrospective outcome study of isolated femoral shaft fracture after intramedullary nailing surgery, it had shown of no significant differences in ROM of hip flexion, hip extension, hip abduction, hip adduction, and knee flexion when compare with normal side when follow-up to 70 months by average (range, 12-132 months) (Helmy, Jando, Lu, Chan, & O'Brien, 2008). Although intramedullary nailing surgery can promote ROM of hip and knee joint, the physical function remained delayed or too long. In this study, the MNRP focused on awareness of mindfulness integrated with gluteal muscle exercise, knee

extension, knee flexion muscle exercise and ankle joint exercise could help. The experimental group have to practice alternately 15-20 minutes per times and 3 times per day. The results demonstrated that the experimental group had improved of muscle strength, PROM of knee flexion at 1 and 3 months after injury. Although it was a short term follow up period, the MNRP by integration of mindfulness had an effect on helping patients rapidly improvement of muscle strength and PROM of hip and knee joint.

However, there were no significant differences of PROM of hip flexion and hip extension when compared with the control group. Hip flexion relates to various muscles including Iliacus, Psoas, Tensor fascla lata, Rectus femoris, Pectineus, and Adductor longus, brevis, and anterior portion of magnus while hip extension associates with Gluteus maximus muscle. Knee flexion relates to many muscles such as Semitendinosus, Semimembranosus, and Biceps femoris (O' Dell et al, 2016). Awareness of mindfulness integrated with all muscle exercises in the program, which is a non-progressive resistance exercise may not be enough to improve PROM of hip flexion and hip extension. Though mindfulness practice participants were able to increase the process of motor learning. Patients with lower extremity injury use the process of motor learning to learn new movements and permanent change in motor performance (Cech & Martin, 2012). The first stage of motor learning may be difficult and need to gain some performances to reduce errors (Magill, 2011). Acting with body and emotional awareness can help patients attend to the current action. The error of practice reduced and patients could pass through the next stage of motor learning. (Kee & Liu, 2011). Due to mindfulness increased gray matter volume in the right anterior insula, as a result, motor learning tend to persist

after training is stopped (Filippi et al., 2010). Finally, Luangpor Teean's awareness-mindfulness meditation and awareness with muscle exercises which are the components of the MNRP can improve physical functioning of the experimental group.

Hypotheses 3 & 4 stated that the median score of psychological distress at 1 and 3 months after injury in the experimental group would be lower from baseline. In addition, the experimental group had lower median score of psychological distress at 1 and 3 months after injury than that of the control group.

Not only physical functioning improvement, a psychological distress was also reduced in this study. The experimental group who received the MNRP had shown lower median score of psychological distress at 1 and 3 months after injury from baseline and had lower median score of psychological distress at 1 and 3 months after injury when compare with the control group. The results are consistent with a previous study by Coffey et al (2010) who showed that mindfulness has an effect on psychological distress by increasing emotion regulation and non-attachment, while decreasing rumination. Mindfulness increased gray matter volume in the right anterior insula which is associated with body and emotional awareness. Hence, mindfulness enhances more awareness of emotional state and stressful state and awareness of body (Murakami, Nakao, Matsunaga, Kasuya, Shinoda, et al, 2012).

Orthopedic injury patients continued to have emotional and psychosocial problems (Ponsford et al., 2008; Richmond et al., 2009). In the current study, the findings demonstrated the MNRP had an effect on reduction of psychological distress in patients with lower extremity injury because the MNRP emphasized Luangpor Teean's awareness-mindfulness meditation which is composed of developing awareness of the

body's movement and visualizing thoughts every time they arise (Luangpor Teean, 1994; Luangpor Teean, 2004; Luangpor Teean, 2005; Luangpor Teean, 2006; Thaiyanond, 2010). It is a simple technique consisted of 15 -20 minutes for each session. Some studies described the mechanisms of mindfulness on structural brain changes and psychological disturbance. For instance, Murakami and colleague explored the relationship between brain structures and each facet of mindfulness and found positive relationship between the describing facets of mindfulness and gray matter volume in the right anterior insula and amygdala (Murakami, Nakao, Matsunaga, Kasuya, Shinoda, et al, 2012). The right anterior insula focused on subjective feelings from the body and emotional awareness then, consistent with the definition of the describing facet of the mindfulness (Craig, 2009; Gu, Hof, Friston, & Fan, 2013). High describing facet of the mindfulness can encourage more awareness of emotional state and stressful state, hence the participants can control over their emotions. Furthermore, mindfulness decreased activating in right amygdala, as a result, lower amygdala response to emotional stimuli. As the amygdala calms down, stressful implicit memories lose strength and adaptive memories are laid down through neural connections (Desbordes et al., 2012). As a result, perceptual and information processing, learning, judgment and emotion are improved (Shonin & Van Gordon, 2016).

The findings in this study were consistent with previous studies.

Mindfulness helps the participants focus on the present with awareness of bodily sensations (Kearney, et al., 2013). Previous studies have shown mindfulness-based intervention was superior to other interventions in reducing psychological symptoms and emotional disturbance (Keng et al., 2011; McCay, et al., 2016; Ostafin et al.,

2006). For instance, Ostafin and colleagues explored the effects of a 10-day Buddhist mindfulness meditation course on the psychological symptom and found a reduction of overall psychological distress from the pre-course baseline to 3 months follow-up (Ostafin, et al., 2006). Moreover, the findings of this study have revealed significant reducing in psychological distress across study periods both 1 and 3 months. This is similar to a previous study by McCay et al (2016) who demonstrated that an 8-week mindfulness-based cognitive therapy can significant decreased psychological distress among chronic illness patients.

Regarding hypotheses 5 and 6, it was shown that the MNRP had a significantly improved of spiritual well-being at 1 and 3 months after injury in the experimental group. The results also showed that spiritual well-being in the experimental group were higher or better improvement than that of the control group at 1, and 3 months after injury.

Lower extremity injury patients in this study had confronted with sudden injury and unplanned hospitalization. Spiritual disturbance can be happened because of some reasons such as the feeling of loneliness by separation from loved ones and changing in physical conditions which often affect both negative and unacceptable feeling on physical image and changing role. However, the MNRP can increase spiritual well-being because the mechanisms of mindfulness can alleviate the feeling of loneliness from life difficulty, understand broaden life perspective, and re-evaluate the priority of life. Mindfulness-based intervention lead person to glance the spiritual truths such as non-self (Shonin & Van Gordon, 2016). Therefore, the current study indicated spiritual well-being of participants in the MNRP group was

significantly improved than that in the control group. Moreover, there were previous evidences which revealed mindfulness has a positive effect on spiritual well-being. For instance, Garland and colleague compare the effects of 8- week mindfulness-based stress reduction (MBSR) and 6-week healing through the creative art (HA) of cancer patients. The study indicated spiritual well-being of participants in the MBSR group was significantly better improvement than that of participants in the HA group (Garland et al., 2007). Similar to another study by Birnie et al (2010) who explored the effects of mindfulness-based stress reduction (MBSR) on self - compassion and empathy, mindfulness, symptoms of stress, mood disturbance and spirituality of 51 participants in a community. There were significantly increased mindfulness, spirituality and self-compassion after receiving the MBSR. In addition, mindfulness can increase the sense of intrapersonal, interpersonal, and transpersonal of patients with visual impairment, as a result, spiritual well-being is increased (Marques-Brocksopp, 2014). So, applying of the MNRP has an effect on spiritual well-being which is consistent with previous studies.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

A randomized control trial was conducted to evaluate the effects of mindfulness - based nursing rehabilitation program (MNRP) on physical functioning psychological distress and spiritual well-being outcomes among Thai Buddhist patients with lower extremity injuries. In this chapter, the conclusions and recommendations are addressed, while strengths and limitations of the study are also provided.

Conclusions of the study

Thirty-four Thai Buddhist patients with lower extremity injuries were randomized by using the minimized randomization software version 2.01 controlling for location of injury, type of fracture and time to operation. The seventeen patients with lower extremity injury in the experimental group received the MNRP on the third day after injury at the hospital and during continual self-practice at the participants' homes while another 17 participants received routine care. The results of the experimental group were compared to those of the control group. At baseline, 1 and 3 months after injury, muscle strength (MS), passive range of motion (PROM) of hip and knee joint were used to assess physical functioning, Brief symptom inventory-18 (BSI-18) was used to evaluate psychological distress, and Spirituality Index of Well-Being (SIWB) was used to assess spiritual well-being. Data at baseline, 1 month, and 3 months after injury were analyzed using descriptive statistic and

inferential statistic including profile analysis, repeated measures Friedman test, Wilcoxon signed-rank test, and Mann Whitney U test. The conclusions of the findings are as following hypotheses.

1. The mean scores of physical functioning at 1 and 3 months after injury in the experimental group were higher than baseline.

2. The mean scores of MS and PROM of knee flexion were higher than that of the control group at 1, and 3 months after injury. However, there were no significant difference in mean score of PROM of hip flexion and hip extension when compare with the control group.

3. The median scores of psychological distress at 1 and 3 months after injury in the experimental group were lower than baseline.

4. The median scores of psychological distress in the experimental group were lower than that of the control group at 1, and 3 months after injury.

5. The median scores of spiritual well-being at 1 and 3 months after injury in the experimental group were higher than baseline.

6. The median scores of spiritual well-being in the experimental group were higher than that of the control group at 1, and 3 months after injury.

Recommendations of the study

The study findings have the potential to contribute to the development of nursing science and knowledge. There are recommendations for the nursing theory, research and practice which describes below.

Nursing theory

The components of the MNRP in this study developed base on Buddhist philosophy and Roy's Adaptation Model could be used in improving physical function, reducing psychological distress, and promoting spiritual well-being of lower extremity injury patients. Luang Por Teean's awareness-mindfulness meditation is one kind of mindfulness-based alternative therapy which helps the patients focus on cultivating alert and balanced attention. Simultaneously, Roy views a person as a holistic adaptive system interrelating with the environment. The regulator and cognator sub-systems are used in order to promote the integrity of the human system. The cognator sub-system responds through four cognitive-emotional channels: perceptual and information processing, learning, judgment and emotion. The facets of mindfulness consist of observing, describing, acting with awareness, non-judging of inner experience and non-reactivity to inner experience. These facets of mindfulness can improve the cognator sub-system effectively. Therefore, Buddhist philosophy and Roy's Adaptation Model provide suitable framework for guiding nursing care for patients with lower extremity injury.

Nursing research

Based on the findings of this study, four recommendations for further study are suggested as follows:

1. This study needs to be replicated using a larger sample group and

more diverse participants. The mindfulness concept is taught independently from religion. Thus, it does not require adherence to beliefs or spiritual practice (Shonin et al., 2013). Consequently, mindfulness can be propagated among non-Buddhist people. Thus, the MNRP that is applied in future research should be provided in a variety of religions.

2. Future research might be extended to other participants requiring a rehabilitation program as treatment at home. Although rehabilitation is a necessary treatment, it is required time-consuming. The findings of this study revealed that the MNRP could encourage the participants to control self and adhere during the rehabilitation period.

3. A follow-up period beyond three months after lower extremity injury would provide further evaluation of the benefits of the MNRP because the bone healing process lasts more than twelve months. Therefore, a follow-up period could be extended to assess long-term changes resulting from the MNRP.

4. The future study is needed to refine the instrument to measure physical functioning using a composite score.

Nursing practice

The MNRP was conducted in order to promote psycho-spiritual well-being and improve physical functioning. The program is uncomplicated and easy to follow. The participants can practice anytime and anywhere. The findings from this study indicate that practicing the exercise integrating mindfulness-based teaching for 15 – 20 minutes at least three times per day is an effective treatment for improving

muscle strength and range of motion for the knee joints. Moreover, the MNRP might be integrated with routine care for orthopedic patients in order to improve physical functioning and psycho-spiritual outcomes.

Although the MNRP could improve both MS and PROM of knee flexion, ROM of hip flexion and extension could not be improved. Therefore, a new version of MNRP should address the exercises that would improve hip joint movement.

Strengths and Limitations

This study aimed at examining the effects of using MNRP on physical functioning, psychological distress, and spiritual well-being outcomes. This study was a randomized controlled trial, two groups, and repeated measures design using the minimized randomization software version 2.01 to ensure a sample balance on potentially confounding factors. Intention-to-treat was used to minimize the threats to internal validity. All participants had good adherence to process and follow-up. This study presented good control in term of internal validity because only the researcher provided the intervention at one hospital site and only one physiotherapist measured MS and PROM of hip and knee joint. It can be concluded that this design reduced the threats to internal validity including history, maturation, selection, experimental mortality, and instrument.

However, several limitations may have affected the results of the study. The recruitment of participants was performed over a period of 12 months, which resulted in only 34 eligible participants potential factors which influence over

difficulty in recruitment included strict eligible criteria and follow-up times at the participants' homes. A demographic limitation for this study was that all of the participants were Thai Buddhist patients aged between 18 and 40 years, medically diagnosed with a unilateral lower extremity injury, underwent orthopedic surgery and participated in a home rehabilitation program. Small sample size and strict eligible criteria could affect the results of an empirical investigation. Thus, the findings could not be generalized to other populations. Hence, this design might increase the threats to external validity. Large sample size and more diverse of participants is recommended to replicate in the future research.

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APPENDICES

Appendix A

INFORMED CONSENT FORM

My name is Chidchanok Mayurapak who is pursuing a degree of Doctor of Philosophy at the Faculty of Nursing, Prince of Songkla University. I am conducting a study on "The effects of the mindfulness-based nursing rehabilitation program on physical functioning, psychological distress, and spiritual well-being of Thai Buddhist with lower extremity injury". The study is aimed to help patients with lower extremity injury to improve physical functioning, reduce psychological distress and promote spiritual well-being during rehabilitation phase. Therefore, it is expected that the results of this study will contribute to improve the quality of care for lower extremity injured patients.

You are being asked to participate in this research study. All Information in this study will remain confidential, no name will be mentioned, and information gather will be reported as a dissertation, which is a requirement for the doctoral degree. The mindfulness-based nursing rehabilitation program (MNRP) will be started on the third day after injury at the hospital by the researcher. After discharge from the hospital, you need to practice by yourself at least three times per day. The follow-up from the researcher assistance will be employed on 1 month and 3 months after injury. During the study, you have the right to withdraw from the participation anytime without the problems prior to completion of data collection. If you interest to participate in this study, you will be assessed the information data as follows.

You will be asked to complete the Demographic data questionnaire,

the muscle strength, and passive range of motion of hip and knee joint, Brief Symptom Inventory-18 (BSI-18), and the Spirituality Index of Well Being (SIWB) at 1 month and 3 months after injury.

When you decide to participate in this study, you will be separated into the experimental group and control group. The control group will receive home health education and home rehabilitation program by the nurses and physiotherapists, and self-practice at your home. The experimental group will receive the mindfulness-based nursing rehabilitation program by the researcher and self-practice at your home. The program takes time 15-20 minutes per time at least 3 times per day. If you feel uncomfortable about participating in this study, please do not hesitate to tell me.

If you have any questions or suggestions or cannot participate in this study you can directly contact me by phone number 086-5951114. If you agree to join this program, please sign your name on the consent form. Please remember to keep your appointment.

Thank you for your kind cooperation

Chidchanok Mayurapak

For participant

This program has been explained to me and I voluntary agree to give my consent to participate in this study.

……..

(Name of participant)

Appendix B

INSTRUMENTS

Part I. Demographic Data Questionnaire (DDQ)

Code: ……..…..

Date: ……

Instruction: Please answer to each of these questions about yourself

1. Age……years
2. Gender ☐ 1. Male ☐ 2. Female
3. What is the highest level of education having you completed? (pre-injury education

   ☐ 1. Less than Grade 6th

   ☐ 2. Grade 6th

   ☐ 3. Grade 9th

   ☐ 4. High school

   ☐ 5. College

   ☐ 6. Bachelor's degree

   ☐ 7. Graduate school
4. What is your occupation? (pre-injury employment)

   ☐ 1. Laborer

   ☐ 2. Government officer

   ☐ 3. Staff in company

   ☐ 4. Self- employed

   ☐ 5.Others (Please specify)……

5. What is your monthly income? (pre-injury income)

   ☐ 1. Less than 30,000 Baht/Year

   ☐ 2. 30,000 – 100,000 Baht/Year

   ☐ 3. More than 100,000 Baht/Year

Part II: Injury characteristics

1. Injury …….
2. Side of injury……
3. Type of fracture……
4. Pain score on the third day post-injury…….
5. Length of hospital stay…….

Part III. Muscle Strength and Passive Range of Motion of Hip and Knee joint

Code: ……..…..
Date: ……

Time-point: …….

Pain score: ……

Muscle Strength of Quadriceps

Grade……

Passive Range of Motion

Hip flexion (Position: Supine/lying)	
Hip extension (Position: Supine/lying)	
Knee flexion (Position: Sitting)	
Knee extension (Position: Sitting)	

Note: this information was evaluated by physiotherapist (research assistance)

Part IV. Brief Symptom Inventory-18 (BSI-18)

Code: ……..…..
Date: ……

Instruction: A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate number to the right statement to indicate how you generally feeling.

Statement	Not at all	Sometimes	Often	Almost always	Extremely
1. Faintness or dizziness	0	1	2	3	4
2. Feeling no interest in thing	0	1	2	3	4
3. Nervousness or shakinessinside	0	1	2	3	4
4.					
5.					
6.					
7.					
8. Feeling blue	0	1	2	3	4
9. Suddenly scared for no reason	0	1	2	3	4
10. Trouble getting your breath	0	1	2	3	4
11. Feeling of worthlessness	0	1	2	3	4
12. Spells of terror or panic	0	1	2	3	4
13. Numbness or tigling in parts of your body	0	1	2	3	4
14. Feeling hopeless about the future	0	1	2	3	4
15. Feeling so restless you couldn’t sit still	0	1	2	3	4
16. Feeling weak in parts of your body	0	1	2	3	4
17. Though of ending your life	0	1	2	3	4
18. Feeling fearful	0	1	2	3	4

Part V. The Spirituality Index of Well Being

Code: ……..
Date: ……

Instruction: A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate number to the right statement to indicate how you generally feeling.

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. There is not much I can do to help myself.	1	2	3	4	5
2. Often, there is no way I can complete what I have started.	1	2	3	4	5
3. I can't begin to understand my problems.	1	2	3	4	5
4. I am overwhelmed when I have personal difficulties and problems.	1	2	3	4	5
5.					
6.					
7.					
8. I don't know who I am, where I came from, or where I am going.	1	2	3	4	5
9. I have a lack of purpose in my life	1	2	3	4	5
10. In this world, I don't know where I fit in.	1	2	3	4	5
11. I am far from understanding the meaning of life.	1	2	3	4	5
12. There is a great void in my life at this time	1	2	3	4	5

Appendix C

Mindfulness-based Nursing Rehabilitation Program (MNRP)

Introduction

Lower extremity injury due to a road traffic accident frequently means sudden injuries and unplanned hospitalization. Patients may be confronted with changes in physical condition such as fractures and have to adapt to changing roles (Maselesele & Idemudia, 2013). Furthermore, these patients require surgeries and other necessary treatments inducing pain, fear and anxiety. As a result of the lack of preparations for a psychological reaction, unexpected situations are difficult to accept. Physically changed conditions may have negative with unacceptable effects on physical image. Patients with lower extremity injury are afraid of pain, organ loss and death. Immobilization due to injuries and treatments leads to a need for help and support from other persons. Unplanned hospitalization gives a sense of separation from loved ones (Khunphadung, 2005). The abovementioned sentences lead patients to suffer a high degree of psychological distress. Psychological distress is caused by negative feelings and thoughts regarding traumatic experiences and future life (Tutton, Seers & Langstaff, 2012). Some patients have perceived inability to cope with their problems (Ridner, 2004). They feel their lives are uncertain, unworthy, hopeless and powerless. They are inert to the activities of daily living and physical therapy; as a consequence, delayed bone healing process occurs. Previous studies have shown that psychological distress following physical traumatic injury affects short-term and long-term outcomes, especially physical impairment and disability.

The treatments for lower extremity injury require not only complete immobilization and surgery but also time for bone healing in the rehabilitation process such as physical therapy for preventing post-injury physical impairment. Richmond and colleagues (2003) found physical impairment to be the best predictor of return to work following physical injury. Thus, the rehabilitation process is important in helping patients to rapidly recover from injuries and return to normal work and social activities. However, Weigl et al (2007) showed psychological distress during rehabilitation to have a negative impact on the recovery process.

Based on the literature review, mindfulness-based interventions have been provided for reducing psychological distress associated with medical problems and psychiatric problems (Kabat-Zinn, 2003). It is an intervention which is to develop present-centered awareness and acceptance in order to control negative thoughts and emotions (Baer, 2003; Bishop et al 2004; Kabat-Zinn, 2003). Furthermore, in terms of rehabilitation, mindfulness can improve the process of motor learning. Therefore, the addition of mindfulness to regular course of physical therapy may be more effective in terms of reduced psychological distress and improved functional outcome than physical therapy alone.

The program is developed base on Buddhist philosophy and Roy adaptation model (2009) by integrating Luangpor Teean' awareness-mindfulness meditation with rehabilitation program, namely, the mindfulness-based nursing rehabilitation program (MNRP). It consists of two components including somatic component and psycho-spiritual component. Somatic components focus on knowledge about fractures, bone healing process, rehabilitation program and time of recovery. Psycho-spiritual components focus on Luangpor Teean' awareness-

mindfulness meditation. The MNRP had integrated psycho-spiritual components (Luangpor Teean' awareness-mindfulness meditation) with somatic components (rehabilitation program) in order to improve physical functioning, reduce psychological distress and promote spiritual well-being.

Purpose of the program

The mindfulness-based nursing rehabilitation program (MNRP) is developed for patients with lower extremity injury in order to improve physical functioning, reduce psychological distress and promote psycho-spiritual well-being during rehabilitation phase.

Qualification of participants

(1) Thai Buddhist patients who aged between 18 and 40 years.

(2) Medically diagnosed as a unilateral lower extremity injury, underwent orthopedic surgery and received home rehabilitation program.

The Structures of the program

The mindfulness-based nursing rehabilitation program composes of three activities. The sequence of presentation is as follow:

1. Health education regarding lower extremity injury, wound healing process, and self-care for improving bone healing process
2. Luangpor Teean's awareness- mindfulness meditation
3. Luangpor Teean's awareness- mindfulness meditation with Exercise program

Activity 1: Health education regarding lower extremity injury, wound healing process, and self-care for improving bone healing process

Although all patients have been prepared for discharge planning, some patients are not fully prepared to subsist on new situation (Purivatanakul, Tipmongkol, & Wongleang, 2007). They have to walk with crutches and manage their lives depending on helps and supports from other people. Stressful situation leads to psychological distress during rehabilitation phase. The above mentioned sentences lead patients to suffer a high degree of psychological distress. Due to psychological distress, their perception regarding health education might be decreased. For example, some patients cannot understand how to use crutches or walker; as a result, they cannot move themselves to anywhere. Therefore, recall health education regarding lower extremity injury, wound healing process, and self-care for improving bone healing process at their home may promote health education knowledge.

Activity 2: Luangpor Teean's Awareness-Mindfulness Meditation

Awareness-mindfulness meditation in this program emerges from Luangpor Teean Jittasubho. It is applied in order to patients to be aware of the movements of the body. Patients can practice this activity in other position such as sitting, lying, standing, or walking. The following paragraph will be described fifteen steps of cultivation self-awareness.

1. Rest the hand palm down on the thighs.
2. Turn the right hand onto its edge, be aware; do it slowly, then stop.
3. Raise the right hand to rest on the abdomen, be aware, and then stop.

4. Lower the right hand to rest on the abdomen, be aware, and then stop.

5. Turn the left hand onto its edge, be aware, and then stop.

6. Raise the left hand up, be aware, and then stop.

7. Lower the left hand to rest on the right hand, be aware, and then stop.

8. Move the right hand up to rest on the chest, be aware, and then stop.

9. Move the right hand out, be aware, and then stop.

10. Lower the right hand onto its edge on the tight, be aware, and then stop.

11. Face the right palm down, be aware, and then stop.

12. Move the left hand up to rest on the chest, be aware, and then stop.

13. Move the left hand out, be aware, and then stop.

14. Lower the left hand onto its edge on the thigh, be aware, and then stop.

15. Face the left palm down, be aware, and then stop.

(*Source*: Luangpor Teean. (1994). *A manual of self-awareness*. Bangkok: Luangpor Teean foundation. Luangpor Teean. (2005). *To one that feels*. (3rd ed.). Bangkok: Supa Printing Co, Ltd.)

<u>Activity 3</u>: Luangpor Teean's awareness mindfulness meditation and a home-based rehabilitation program

<u>Activity3.1</u>: Luangpor Teean's awareness mindfulness meditation and Gluteal muscle exercise 1

Lie down.....	Be aware of the feeling
Inhale, Tense the anterior hip muscle by lifting a leg 10 second (count 1-10)……	Be aware of the feeling
Exhale, Relax the anterior hip muscle by placing a leg on the bed, and count 1-10……..	Be aware of the feeling
Practice alternately 15 sections per times and 3 times per day.....	Be aware of the feeling

<u>Activity3.2</u>: Luangpor Teean's awareness mindfulness meditation and Gluteal muscle exercise 2

Lie down.....	Be aware of the feeling
Inhale, Tense the posterior hip muscle by pressing a leg 10 second (count 1-10)……..	Be aware of the feeling

Exhale, Relax the posterior hip muscle by placing a leg on the bed, and count 1-10…….. Be aware of the feeling

Practice alternately 15 sections per times and 3 times per day..... Be aware of the feeling

<u>Activity3.3</u>: Luangpor Teean's awareness mindfulness meditation and Gluteal muscle exercise 3

Lie down..... Be aware of the feeling

Inhale, Tense the external hip muscle and abduction of leg 10 second (count 1-10)……. Be aware of the feeling

Exhale, Relax the external hip muscle by placing a leg on the bed, and count 1-10…… Be aware of the feeling

Inhale, Tense the internal hip muscle and adduction of leg 10 second (count 1-10)……. Be aware of the feeling

Exhale, Relax the internal hip muscle by placing a leg on the bed, and count 1-10…… Be aware of the feeling

Practice alternately 15 sections per times and 3 times per day..... Be aware of the feeling

<u>Activity 4</u>: Luangpor Teean's awareness mindfulness meditation and knee extension and knee flexion muscle exercise

Lie down..... Be aware of the feeling

Inhale, Tense the muscle above knee joint by pressing knee on the bed (count 1-10)…….. Be aware of the feeling

Exhale, Relax the muscle above knee joint by placing a leg on the bed, and count 1-10…… Be aware of the feeling

Practice alternately 15 sections per times and 3 times per day..... Be aware of the feeling

<u>Activity 5</u>: Luangpor Teean's awareness mindfulness meditation and knee flexion muscle exercise 2

Lie down..... Be aware of the feeling

Inhale, Tense the muscle below knee joint by pedaling toe down to the bed (Count 1-10)…….. Be aware of the feeling

Exhale, Relax the muscle below knee joint by placing a leg on the bed, and count 1-10……	Be aware of the feeling
Practice alternately 15 sections per times and 3 times per day.....	Be aware of the feeling

<u>Activity 6</u>: Luangpor Teean's awareness mindfulness meditation and ankle joint exercise 1

Lie down.....	Be aware of the feeling
Flap ankle joint up and down alternately……..	Be aware of the feeling
Rotation ankle joint alternately…….	Be aware of the feeling
Practice alternately 30 sections per times and 3 times per day.....	Be aware of the feeling

<u>Activity 7</u>: Luangpor Teean's awareness mindfulness meditation and ankle joint exercise 2

Lie down.....	Be aware of the feeling
Flap toe up and down alternately……..	Be aware of the feeling
Practice alternately 30 sections per times and 3 times per day.....	Be aware of the feeling

Activity 8: Luangpor Teean's awareness mindfulness meditation and standing/walking with crutches

Put crutches under your armpit…….	Be aware of the feeling
Hold your crutches by elbow flexion about 15 degree……..	Be aware of the feeling
Move your crutches forward…….	Be aware of the feeling
Move injured leg forward to your crutches (non-weight)…….	Be aware of the feeling
Press your hands simultaneously……...	Be aware of the feeling
Move your body forward……...	Be aware of the feeling

Practice continuously…… Be aware of the feeling

Activity 9: Luangpor Teean's awareness mindfulness meditation and walking up stairs with crutches

Put crutches under your armpit……. Be aware of the feeling

Hold your crutches by elbow flexion about 15 degree…….. Be aware of the feeling

Move healthy leg up stairs…… Be aware of the feeling

Move injured leg up stairs…… Be aware of the feeling

Practice continuously…… Be aware of the feeling

Activity 10: Luangpor Teean's awareness mindfulness meditation and walking down stairs with crutches

Put crutches under your armpit……. Be aware of the feeling

Hold your crutches by elbow flexion about 15 degree…….. Be aware of the feeling

Move injured leg down stairs…… Be aware of the feeling

Move healthy leg down stairs……	Be aware of the feeling
Practice continuously……	Be aware of the feeling

The schedule of implementation a mindfulness-based nursing rehabilitation program (MNRP) for Thai Buddhist patients with lower extremity injury

Date	Location	Activities
Third days after injury	Orthopedic ward	1. Assessment demographic, socioeconomic characteristics and injury characteristics by using Demographic Data Questionnaire (DDQ) 2. Assessment physical functioning by measuring muscle strength and passive range of motion of hip and knee joints 3. Assessment psychological distress by using Brief Symptom Inventory-18 (BSI-18) 4. Assessment spiritual well-being by using Spirituality Index Well-Being (SIWB) 5. The participants received MNRP in activity *1 and 2* and practiced.
After off drainage	physiotherapy department Orthopedic ward	1. The participants were transferred to physiotherapy department for training a home-based rehabilitation program. 2. The participants received MNRP in Activity3 and practiced.
1 week after discharge	Participant's home	The participants were contacted by telephone in order to ensure patients' practice of the MNRP at home and evaluate the barriers of practice.
1 month after injury	Participant's home	1. Assessment physical functioning by measuring muscle strength, passive range of motion of hip and knee joints 2. Assessment psychological distress by using Brief Symptom Inventory-18 (BSI-18) 3. Assessment spiritual well-being by using Spirituality Index Well-Being (SIWB)
3 month after injury	Participant's home	1. Assessment physical functioning by measuring muscle strength, passive range of motion of hip and knee joints 2. Assessment psychological distress by using Brief Symptom Inventory-18 (BSI-18) 3. Assessment spiritual well-being by using Spirituality Index Well-Being (SIWB)

โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติ

สำหรับผู้ป่วยไทยพุทธที่กระดูกรยางค์ล่างบาดเจ็บ

โดย

นางสาวชิดชนก มยูรภักดิ์

นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาการพยาบาล (นานาชาติ)

คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์

ที่ปรึกษาวิทยานิพนธ์

รองศาสตราจารย์ ดร. ประณีต ส่งวัฒนา

ผู้ช่วยศาสตราจารย์ ดร. วงจันทร์ เพชรพิเชฐเชียร

คำนำ

การเกิดกระดูกรยางค์ล่างบาดเจ็บเป็นปัญหาที่สำคัญและพบมากของโรคกระดูก กล้ามเนื้อ และข้อ โดยเฉพาะในวัยผู้ใหญ่และมักจะมีสาเหตุจากอุบัติเหตุรถยนต์ แม้จะไม่รุนแรงถึงกับทำให้ผู้ป่วยเสียชีวิต แต่ผลของการบาดเจ็บและการรักษาที่ได้รับ รวมถึงความพิการที่อาจหลงเหลืออยู่ ทำให้ผู้ป่วยเกิดความเครียด กลัว วิตกกังวล เกิดความรู้สึกสูญเสียอิสรภาพ รู้สึกตนเองเป็นคนไร้ค่า ผู้ป่วยบางรายอาจมีภาวะซึมเศร้าและมีภาวะเครียดภายหลังเหตุการณ์สะเทือนใจ ทำให้ความกระตือรือร้นในการปฏิบัติกิจวัตรประจำวันรวมถึงความกระตือรือร้นในการทำกายภาพบำบัดเพื่อการฟื้นฟูสมรรถภาพลดลง ผลที่ตามมาคือ กระดูกติดช้า หรืออาจเกิดภาวะ ข้อติดแข็ง

ช่วงเวลาที่รอการฟื้นหายของกระดูก จำเป็นต้องมีกระบวนการฟื้นฟูสมรรถภาพ เช่นการทำกายภาพบัด เพื่อป้องกันการบกพร่องทางร่างกายที่อาจจะเกิดขึ้นภายหลังการบาดเจ็บ โปรแกรมฟื้นฟูสมรรถภาพแม้จะมีความสำคัญสำหรับผู้ป่วยกลุ่มนี้ แต่หากต้องปฏิบัติภายใต้สภาวะจิตใจที่เปราะบาง มีความเครียด วิตกกังวล หรือซึมเศร้านั้น ประสิทธิภาพของการฟื้นฟูสภาพย่อมลดลง ดังนั้นการจัดกิจกรรมที่มีการบูรณาการการฟื้นฟูจิตใจด้วยหลักคำสอนเชิงพุทธที่เน้นการฝึกสติร่วมกับการฟื้นฟูสมรรถภาพร่างกาย จะช่วยส่งเสริมให้ผู้ป่วยมีสภาวะจิตใจที่สงบและมีพลังภายหลังการบาดเจ็บ มีสติในขณะทำการฝึกการฟื้นฟูสมรรถภาพ ส่งผลให้มีความมุ่งมั่นพยายามที่จะปฏิบัติตามโปรแกรมฟื้นฟูสภาพอย่างต่อเนื่องและเกิดการฟื้นหายของกระดูกและกล้ามเนื้อดีขึ้น

โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติสำหรับผู้ป่วยไทยพุทธที่กระดูกรยางค์ล่างบาดเจ็บ จัดทำขึ้นเพื่อให้ผู้ป่วยได้รับการฟื้นฟูร่างกายและจิตใจภายหลังการบาดเจ็บ เพื่อเป้าหมายหลักคือ การกลับไปทำงานหรือสามารถทำกิจกรรมทางสังคมได้เหมือนหรือใกล้เคียงก่อนการบาดเจ็บภายในเวลาที่เหมาะสม

สารบัญ

โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติ สำหรับผู้ป่วยไทยพุทธที่กระดูกรยางค์ล่างบาดเจ็บ

หลักการและเหตุผล

โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติพัฒนาจากแนวคิดของพุทธปรัชญาและทฤษฎีการปรับตัวของรอย โปรแกรมประกอบด้วย 2 องค์ประกอบหลักคือ องค์ประกอบด้านร้างกายและองค์ประกอบด้านจิตปัญญา

องค์ประกอบด้านร่างกาย

การรักษาภาวะกระดูกรยางค์ล่างบาดเจ็บ ไม่ได้สิ้นสุดเพียงแค่การจำกัดการเคลื่อนไหว การจัดกระดูกและ/หรือการผ่าตัดเท่านั้น ช่วงเวลาที่รอการฟื้นหายของกระดูก จำเป็นต้องมีกระบวนการฟื้นฟูสมรรถภาพซึ่งเป็นกระบวนการสำคัญที่มีวัตถุประสงค์เพื่อป้องกันการบกพร่องทางร่างกาย ที่อาจจะเกิดขึ้นภายหลังการบาดเจ็บ กิจกรรมประกอบด้วย ความรู้เกี่ยวกับการบาดเจ็บ การฟื้นหายของแผล กระบวนการฟื้นหายของกระดูก การบริหารเพื่อเพิ่มพิสัยของข้อ, การออกกำลังเพื่อเพิ่มความแข็งแรงและความทนทานของกล้ามเนื้อ เป็นต้น

จากการทบทวนวรรณกรรมพบว่า การบกพร่องทางร่างกายภายหลังการบาดเจ็บ เป็นปัจจัยสำคัญที่มีผลต่อการกลับไปทำงานหรือทำหน้าที่ทางสังคมของผู้ป่วยกระดูกรยางค์ล่างบาดเจ็บ ดังนั้นกระบวนการฟื้นฟูสมรรถภาพจึงเป็นกระบวนการหนึ่งที่จะช่วยให้ผู้ป่วยมีการฟื้นหายเร็วขึ้น สามารถกลับไปทำงานหรือทำกิจกรรมทางสังคมได้เหมือนเดิมหรือใกล้เคียงก่อนการบาดเจ็บ ภายในเวลาที่เหมาะสม

องค์ประกอบด้านจิตปัญญา

กระดูกรยางค์ล่างบาดเจ็บ เป็นปัญหาที่สำคัญและพบมากของโรคกระดูก ข้อ เอ็นและกล้ามเนื้อ ถึงแม้การบาดเจ็บจะไม่รุนแรงถึงกับทำให้ผู้ป่วยเสียชีวิต แต่ผลของการบาดเจ็บและการรักษาที่ได้รับ ทำให้ผู้ป่วยไม่สุขสบายทางด้านร่างกาย เกิดความเจ็บปวดขณะเคลื่อนไหวร่างกายหรือเมื่อเปลี่ยนอิริยาบถ ไม่สามารถปฏิบัติกิจวัตรประจำวันได้เอง ต้องพึ่งพาผู้อื่นในการปฏิบัติกิจกรรมต่าง ๆ นอกจากนี้ การไม่ได้รับการเตรียมตัวเตรียมใจในการพักรักษาตัวในโรงพยาบาล ส่งผลให้ผู้ป่วยเกิดความกลัว เครียด วิตกกังวล และบางรายอาจมีภาวะซึมเศร้า นำไปสู่การบีบคั้นทางจิตใจและจิตวิญญาณ

ความบาดเจ็บที่เกิดขึ้นนี้ในทางพุทธศาสนาถือว่าเป็นทุกข์ทางกายและทุกข์ทางใจ ความทุกข์ทางกายที่เกิดจากการบาดเจ็บ เป็นสิ่งที่เกิดขึ้นแล้ว ไม่สามารถย้อนไปว่าไม่น่าจะเกิดขึ้นได้ หากบุคคลยังคงเฝ้าครุ่นคิด ครำ่ครวญ โศกเศร้า ว่าไม่น่าเกิดเหตุการณ์ขึ้นเลย จะเป็นเหตุให้เกิดทุกข์ เช่น รู้สึกโกรธกับโชคชะตา ด่าทอคนรอบข้าง หรือเกลียดคนที่ทำให้ตัวเองบาดเจ็บ หรือรู้สึกผิดที่ไม่ระมัดระวัง เกิดความรู้สึกเศร้าโศกหากอุบัติเหตุครั้งนี้มีการสูญเสียเกิดขึ้น ในขณะเดียวกันความวิตกกังวลกับอนาคตที่ยังมาไม่ถึงก็เป็นเหตุให้เกิดทุกข์ได้เช่นเดียวกัน กล่าวคือ ผู้ป่วยบางรายกังวลเรื่องค่ารักษาพยาบาล เศรษฐกิจ บางรายอาจเกิดความกลัวว่าจะไม่สามารถกลับมาเดินได้อีก กังวลว่าแผลอาจจะไม่หายหรือใช้เวลานานในการรักษา และอาจต้องเปลี่ยนงานหรือออกจากงาน จะเห็นได้ว่าความทุกข์ทางกายที่เกิดขึ้นทำให้เกิดความทุกข์ทางใจซึ่งขึ้นอยู่กับความรุนแรงของการบาดเจ็บ ความทุกข์ทางใจ เกิดจากความเจ็บปวดที่เผชิญอยู่จริง ร่วมกับความคิดที่ปรุงแต่งไปตามอารมณ์ที่เข้ามากระทบ เป็นความคิดที่ไม่อยู่กับปัจจุบันขณะ เป็นความคิดที่มีการย้อนกลับไปยังอดีตหรือบางครั้งเป็นความคิดที่คิดล่วงหน้าไปยังอนาคต

จากการทบทวนวรรณกรรมพบว่า การฝึกสติเป็นอีกหนึ่งวิธีการที่นักจิตบำบัดเลือกนำมาใช้ในการลดภาวะบีบคั้นทางจิตใจ ผลของการฝึกสติทำให้ร่างกายมีการปรับสมดุลของอารมณ์ ลดความเครียด จากการศึกษาสมองส่วนอไมกดาลา ซึ่งเป็นส่วนของสมองที่ทำหน้าที่ในการรับรู้ความทรงจำทางด้านอารมณ์ พบว่า การฝึกสติมีส่วนช่วยในการควบคุมอารมณ์ นอกจากนี้ในกระบวนการของการฟื้นฟูสมรรถภาพ พบว่า การฝึกสติสามารถส่งเสริมกระบวนการของการเรียนรู้การเคลื่อนไหว ซึ่งเป็นกระบวนสำคัญที่ถูกนำมาใช้เพื่อการฟื้นหายของระบบการเคลื่อนไหวภายหลังการบาดเจ็บและการฝึกการเรียนรู้การเคลื่อนไหวนี้จะนำไปสู่การพัฒนาการทำหน้าที่ในการเคลื่อนไหวต่อไป

เมื่อนำการฝึกสติมาบูรณาการร่วมกับการฟื้นฟูสมรรถภาพ ถือว่าเป็นลักษณะของการกำหนดระลึกรู้ในกาย กล่าวคือ จิตมีการรับรู้ในขณะที่กายมีการเคลื่อนไหว รู้ตัวว่าขณะนี้กำลังทำกายภาพบำบัด มีการเกร็งกล้ามเนื้อสะโพก มีการยกขา ฯลฯ เป็นการรู้สึกถึงสิ่งที่ปรากฏอยู่จริง ซึ่งหากสามารถกำหนดจิตให้รับรู้ในกายตลอดระยะเวลาของการทำกายภาพบำบัด จะช่วยให้ร่างกายมีการหลั่งสารสื่อระบบประสาทเช่น ซีโรโตนิน ที่สามารถยับยั้งการหลั่งฮอร์โมนคอร์ติซอล ซึ่งเป็นฮอร์โมนความเครียด ร่างกายเกิดการปรับสมดุลทางอารมณ์และความคิด สามารถควบคุมอารมณ์ ลดความเครียดและลดความบีบคั้นทางจิตใจและจิตวิญญาณได้

จะเห็นได้ว่า องค์ประกอบด้านร่างกายและองค์ประกอบด้านจิตปัญญามีความสำคัญไม่ยิ่งหย่อนไปกว่ากัน ดังนั้นการบูรณาการทั้งสององค์ประกอบในสัดส่วนที่เหมาะสม จะก่อให้เกิดประโยชน์มากกว่าการเน้นหนักไปที่องค์ประกอบใดองค์ประกอบหนึ่ง กล่าวคือ เมื่อผู้ป่วยมีสติอยู่กับเคลื่อนไหวขณะทำการฟื้นฟูสมรรถภาพร่างกาย รู้เท่าทันความรู้สึกเจ็บปวดไม่สุขสบาย ความคิดและอารมณ์ปรุงแต่งต่างๆ สิ่งเหล่านี้จะช่วยส่งเสริมให้ผู้ป่วยมีสภาวะจิตใจที่สมดุล มีการหลั่งของฮอร์โมนเอนโดฟิน และซีโรโตนิน ที่จำเป็นสำหรับการฟื้นหายเพิ่มมากขึ้น อีกทั้งช่วยเพิ่มพิสัยของข้อและความ

แข็งแรงของกล้ามเนื้อ เมื่อจิตมีความมุ่งมั่นตั้งมั่นพากเพียรในการปฏิบัติตามหลักการฟื้นฟูสภาพอย่างต่อเนื่อง

วัตถุประสงค์ โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติจัดทำขึ้นเพื่อส่งเสริมให้ผู้ป่วยที่กระดูกรยางค์ล่างบาดเจ็บ มีสมรรถภาพทางร่างกายที่พร้อมสำหรับการกลับไปใช้ชีวิตในสังคมภายในเวลาที่เหมาะสม ลดภาวะบีบคั้นทางจิตใจและส่งเสริมให้เกิดจิตปัญญา ภายหลังการบาดเจ็บ

คุณสมบัติของผู้เข้าร่วมโปรแกรม

กลุ่มเป้าหมายคือผู้ป่วยไทยพุทธอายุระหว่าง 18 – 40 ปี ที่ได้รับการบาดเจ็บของกระดูกรยางค์ล่าง ได้รับการรักษาโดยการผ่าตัดและโปรแกรมฟื้นฟูสมรรถภาพที่บ้าน

ขั้นตอนการดำเนินการตามโปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติ

โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติพัฒนาจากการเชื่อมโยงการองค์ประกอบด้านร่างกายร่วมกับองค์ประกอบด้านจิตปัญญา เพื่อส่งเสริมกระบวนการฟื้นหายของผู้ป่วยกระดูกรยางค์ล่างบาดเจ็บทั้งทางด้านร่างกาย จิตใจและจิตปัญญา มีองค์ประกอบ ที่สำคัญของโปรแกรมดังนี้

1. องค์ประกอบด้านร่างกาย (Somatic components): ความรู้เกี่ยวกับการบาดเจ็บของกระดูกรยางค์ล่างบาดเจ็บ กระบวนการฟื้นหายของกระดูกและการฟื้นฟูสมรรถภาพร่างกาย
2. องค์ประกอบด้านจิตปัญญา (Psycho-spiritual components): การฝึกสติแบบเคลื่อนไหวตามแนวทางหลวงพ่อเทียน

โครงสร้างโปรแกรม

โปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติประกอบด้วย 3 กิจกรรมหลักดังนี้

1. ความรู้เกี่ยวกับกระดูกรยางค์ล่างบาดเจ็บ กระบวนการฟื้นหายของแผล และการปฏิบัติตัวเพื่อส่งเสริมการฟื้นหายของกระดูก

2. การฝึกสติแบบเคลื่อนไหวตามแนวทางหลวงพ่อเทียน

3. การบูรณาการการฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการฟื้นฟูสมรรถภาพร่างกาย

กิจกรรมที่ 1 ความรู้เกี่ยวกับกระดูกรยางค์ล่างบาดเจ็บ กระบวนการฟื้นหายของแผล และการปฏิบัติตัวเพื่อส่งเสริมการฟื้นหายของกระดูก

ความรู้เกี่ยวกับกระดูกรยางค์ล่างบาดเจ็บ กระบวนการฟื้นหายของแผล และการปฏิบัติตัวเพื่อส่งเสริมการฟื้นหายของกระดูก ประกอบด้วย

(1) ความรู้เกี่ยวกับกระดูกรยางค์ล่างบาดเจ็บ กระบวนการฟื้นหายของแผล

(2) การปฏิบัติตัวเพื่อส่งเสริมการฟื้นหายของกระดูก

(2.1) โภชนการ

(2.2) การรับประทานยาตามแผนการรักษาของแพทย์

(2.3) การดูแลแผล

(2.4) การออกกำลังกายเพื่อการฟื้นฟู

(2.5) การใช้อุปกรณ์ช่วยในการเดิน เช่น ไม้ค้ำยัน

กิจกรรมที่ 2 การฝึกสติแบบเคลื่อนไหวตามแนวทางหลวงพ่อเทียน จิตตสุโภ

การฝึกสติแบบเคลื่อนไหวตามแนวหลวงพ่อเทียน จิตตสุโภมีจุดมุ่งหมายเพื่อควบคุมและอยู่เหนืออิทธิพลของความคิดปรุงแต่ง

ในสมัยพุทธกาลมีคนเคยถามพระพุทธเจ้าว่า “อะไรเป็นเครื่องกั้นกิเลสซึ่งเหมือนกระแสน้ำไม่ให้ไหลท่วมท้นจิตใจ” พระพุทธเจ้าตอบว่า ***“สติเป็นเครื่องห้ามกระแสกิเลส ส่วนปัญญาเป็นเครื่องละกระแสกิเลส”*** หรือว่าตัดกระแสกิเลส หมายความว่า กระแสกิเลสมันมีอยู่แล้ว สติทำหน้าที่เป็นตัวห้าม ทำให้มันสลายตัวลง ไม่ว่าเป็นอกุศลกรรม เช่น ความโกรธ ความเกลียด ความเศร้า พอเจอสติ ก็จะหายไป ไม่ต่อเนื่องเป็นกระแส เรียกว่า ดับไป ส่วนปัญญาเป็นเครื่องป้องกัน ไม่ให้เกิด ไม่ให้กิเลสเกิดขึ้น หรือไม่ให้กิเลสเกิดเป็นกระแสขึ้นมา...

“การทำงานของสติ คือ การรู้ทัน พอมีความโกรธเกิดขึ้น พอมีความทุกข์เกิดขึ้นแล้ว ก็รู้ รู้แล้วก็วาง เวลาปวดเมื่อย ใจมันก็เกิดโทสะ ความทุกข์มันก็เกิดตามด้วย แต่ถ้าเรามีสติรู้ทัน โทสะที่เกิดขึ้นในใจ มันก็วางได้ โทสะนั้นก็ดับไป ใจก็กลับมาเป็นปกติได้ กายยังปวดเมื่อยอยู่ แต่ว่าใจเป็นปกติ เพราะมันเห็น มันรู้ทันอาการกระเพื่อมของใจ ว่ามีความชังเกิดขึ้น มีโทสะเกิดขึ้น มีความไม่ชอบเกิดขึ้น สติรู้ทัน ตัดกระแสความคิดปรุงแต่งนั้น ความคิดนั้นก็ดับไป”(พระไพศาล วิสาโล, 2556) วิธีปฏิบัติเพื่อให้เกิดสติตามแนวทางหลวงพ่อเทียน จิตตสุโภเป็นการปฏิบัติแบบเคลื่อนไหวอิริยาบถน้อยใหญ่ซึ่งเป็นอาการที่มีอยู่แล้วตามธรรมชาติ เช่น การยืน การเดิน การนั่ง การนอน เป็นต้น แต่สติที่กำหนดการเคลื่อนไหวอิริยาบถน้อยใหญ่ตามธรรมชาตินั้นไม่มีกำลังเพียงพอให้ความรู้สึกตัวมีกำลังมากพอ หลวงพ่อเทียนจึงสร้างรูปแบบการเจริญสติโดยวิธีทำจังหวะเคลื่อนไหวมือขึ้นเพื่อปลุกเร้าความรู้สึกตัวให้มีกำลังมากเท่าที่ต้องการ สติความรู้สึกตัวที่มีกำลังอย่างเพียงพอจะทำหน้าที่เข้าไปรู้ความคิดที่เกิดขึ้นในจิตพร้อมกับตัดกระแสความคิดปรุงแต่งทันที เป็นเหตุให้เกิดปัญญารู้เห็นสภาวธรรมตามความเป็นจริง หรือกลับมาสู่ปัจจุบันขณะ

วิธีการปฏิบัติการฝึกสติตามแนวทางหลวงพ่อเทียน จิตตสุโภ เป็นวิธีการที่ง่ายต่อการปฏิบัติและเน้นความสากลในทางปฏิบัติ กล่าวคือ ทุกคนที่มีความรู้สึกตัวไม่ว่าจะอยู่ในช่วงวัยใด ชาติใด ภาษาใด ศาสนาใด หรือยากดีมีจนเช่นไร หรือแม้จะมีร่างกายพิการหรือ เคลื่อนไหวอวัยวะได้เพียงบางส่วน ก็สามารถนำวิธีการนี้มาปฏิบัติได้ทุกเวลาและสถานที่

หลวงพ่อเทียนกล่าวว่า *“สติคือรู้สึกตัว ตอนเคลื่อนให้รู้สึก ตอนหยุดให้รู้สึก มีความคิดเกิดขึ้น ก็ รู้เฉยๆ ...แล้วกลับมารู้การเคลื่อน...การหยุด ต่อไป จะคิดฟุ้งซ่านอีกกี่ครั้ง ...ก็รู้ อยู่กับการรู้สึกตัว ต่อเนื่องเป็นประจำ เป็นปกติ ไม่เพ่งจ้อง เมื่อทำได้ตรงตามนี้ ไม่เกิน 7 วัน ถึง 7 ปี ย่อมสามารถพ้นทุกข์ได้ หรืออย่างน้อยก็มีทุกข์น้อยลงได้ทุกคน”*

กิจกรรมการฝึกสติแบบเคลื่อนไหวตามแนวทางหลวงพ่อเทียน จิตฺตสุโภ ประกอบด้วย 15 ท่าที่มีการเคลื่อนไหวอย่างต่อเนื่องดังนี้

1. เอามือวางไว้ที่ขาทั้งสองข้าง ..... คว่ำไว้
2. พลิกมือขวาตะแคงขึ้น ..... ทำช้าๆ.....ให้รู้สึก
3. ยกมือขวาขึ้นครึ่งตัว ..... ให้รู้สึก .....มันหยุดก็ให้รู้สึก
4. เอามือขวามาที่สะดือ..... ให้รู้สึก
5. พลิกมือซ้ายตะแคงขึ้น..... ให้รู้สึก
6. ยกมือซ้ายขึ้นครึ่งตัว ..... ให้รู้สึก
7. เอามือซ้ายมาที่สะดือ..... ให้รู้สึก
8. เลื่อนมือขวาขึ้นหน้าอก..... ให้รู้สึก
9. เอามือขวาออกตรงข้าง..... ให้รู้สึก
10. ลดมือขวาลงที่ขาขวา ตะแคงไว้..... ให้รู้สึก
11. คว่ำมือขวาลงที่ขาขวา..... ให้รู้สึก

12. เลื่อนมือซ้ายมาที่หน้าอก..... ให้รู้สึก

13. เอามือซ้ายออกมาตรงข้าง..... ให้รู้สึก

14. ลดมือซ้ายลงที่ขาซ้าย ตะแคงไว้..... ให้รู้สึก

15. คว่ำมือซ้ายลงที่ขาซ้าย..... ให้รู้สึก

ทำต่อไปเรื่อยๆ..... ให้มีความรู้สึกตัว

กิจกรรมการฝึกสติแบบเคลื่อนไหวตามแนวทางหลวงพ่อเทียนนี้ ผู้ป่วยสามารถปฏิบัติในท่านั่งหรือท่านอนก็ได้

1. เอามือวางไว้ที่ขาทั้งสองข้าง...คว่ำไว้

2. พลิกมือขวาตะแคงขึ้น.... ทำช้าๆ.....ให้รู้สึก

3. ยกมือขวาขึ้นครึ่งตัว.... ให้รู้สึก .....มันหยุดก็ให้รู้สึก

4. เอามือขวามาที่สะดือ...

ให้รู้สึก

5. พลิกมือซ้ายตะแคงขึ้น....

ให้รู้สึก

6. ยกมือซ้ายขึ้นครึ่งตัว...

ให้รู้สึก

7. เอามือซ้ายมาที่สะดือ...

ให้รู้สึก

8. เลื่อนมือขวาขึ้นหน้าอก...

ให้รู้สึก

9. เอามือขวาออกตรงข้าง...

ให้รู้สึก

10. ลดมือขวาลงที่ขาขวา ตะแคงไว้....ให้รู้สึก

11. คว่ำมือขวาลงที่ขาขวา... ให้รู้สึก

12. เลื่อนมือซ้ายมาที่หน้าอก...ให้รู้สึก

13. เอามือซ้ายออกมาตรงข้าง...ให้รู้สึก

14. ลดมือซ้ายลงที่ขาซ้ายตะแคงไว้...ให้รู้สึก

15. คว่ำมือซ้ายลงที่ขาซ้าย... ให้รู้สึก

กิจกรรมที่ 3 การบูรณาการการฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการฟื้นฟูสมรรถภาพร่างกาย

การรักษาภาวะกระดูกรยางค์ล่างบาดเจ็บ ไม่ได้สิ้นสุดเพียงแค่การจำกัดการเคลื่อนไหว การจัดกระดูกและ/หรือการผ่าตัดเท่านั้น ช่วงเวลาที่รอการฟื้นหายของกระดูก จำเป็นต้องมีกระบวนการฟื้นฟูสมรรถภาพซึ่งเป็นกระบวนการสำคัญที่มีวัตถุประสงค์เพื่อป้องกันการบกพร่องทางร่างกาย ที่อาจจะเกิดขึ้นภายหลังการบาดเจ็บ กิจกรรมประกอบด้วย การบริหารเพื่อเพิ่มพิสัยของข้อ, การออกกำลังเพื่อเพิ่มความแข็งแรงและความทนทานของกล้ามเนื้อ เป็นต้น

จากการทบทวนวรรณกรรมพบว่า การบกพร่องทางร่างกายภายหลังการบาดเจ็บ เป็นปัจจัยสำคัญที่มีผลต่อความสามารถในการทำหน้าที่ของร่างกาย รวมถึงกลับไปทำงานหรือทำหน้าที่ทางสังคมของผู้ป่วยกลุ่มนี้ ดังนั้นกระบวนการฟื้นฟูสมรรถภาพ จึงเป็นกระบวนการหนึ่งที่จะช่วยให้ผู้ป่วยมีการฟื้นหายเร็วขึ้น สามารถกลับไปทำงานหรือกิจกรรมทางสังคมได้เหมือนเดิมหรือใกล้เคียงก่อนการบาดเจ็บ ภายในเวลาที่เหมาะสม

ถึงแม้โปรแกรมฟื้นฟูสมรรถภาพแม้จะมีความสำคัญสำหรับผู้ป่วยกลุ่มนี้ แต่หากต้องปฏิบัติภายใต้สภาวะจิตใจที่เปราะบาง มีความเครียด วิตกกังวล หรือซึมเศร้านั้น ประสิทธิภาพของโปรแกรมย่อมลดลง ดังนั้นการจัดกิจกรรมที่มีการบูรณาการการฟื้นฟูจิตใจด้วยการฝึกสติร่วมกับการฟื้นฟูสมรรถภาพร่างกาย จะช่วยส่งเสริมให้ผู้ป่วยมีสภาวะจิตใจที่เข้มแข็งขึ้นภายหลังการบาดเจ็บ มีสติอยู่กับการปฏิบัติตามโปรแกรมฟื้นฟูสมรรถภาพ เกิดการปฏิบัติตามโปรแกรมอย่างต่อเนื่อง

กิจกรรมการการบูรณาการการฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการฟื้นฟูสมรรถภาพร่างกาย ประกอบด้วยกิจกรรมย่อย 10 กิจกรรม

<u>กิจกรรมย่อยที่ 1</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อรอบข้อสะโพกท่าที่ 1

นอนหงายบนเตียง ขาวางราบกับพื้นเตียง.....ให้รู้สึก

หายใจเข้า เกร็งกล้ามเนื้อสะโพกด้านหน้าโดยออกแรงยกขาขึ้นค้างไว้ นับ 1-10.....ให้รู้สึก

หายใจออก คลายกล้ามเนื้อสะโพก

ด้านหน้าโดยวางขาราบบนเตียง

นับ 1-10.....ให้รู้สึก

ทำสลับกันต่อไปเรื่อยๆ 15 ครั้งต่อรอบ

3 รอบต่อวัน...ให้มีความรู้สึกตัว

<u>กิจกรรมย่อยที่ 2</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อรอบข้อสะโพกท่าที่ 2

นอนหงายบนเตียง ขาวางราบกับ

พื้นเตียง.....ให้รู้สึก

หายใจเข้า เกร็งกล้ามเนื้อสะโพกด้านหลังโดยกดขาลงกับเตียงค้างไว้นับ 1-10 .....ให้รู้สึก

หายใจออก คลายกล้ามเนื้อสะโพกด้านหลัง โดยวางขาราบบนเตียง

นับ 1-10.....ให้รู้สึก

ทำสลับกันต่อไปเรื่อยๆ 15 ครั้งต่อรอบ 3 รอบต่อวัน.....ให้มีความรู้สึกตัว

<u>กิจกรรมย่อยที่ 3</u>การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อรอบข้อสะโพกท่าที่ 3

นอนหงายบนเตียง ขาวางราบกับพื้นเตียง..... ให้รู้สึก

หายใจเข้า เกร็งกล้ามเนื้อสะโพกทางด้านนอกในขณะที่พยายามกางขาออกค้างไว้นับ 1-10... ให้รู้สึก

หายใจออก คลายกล้ามเนื้อสะโพกทางด้านนอกโดยวางขาราบบนเตียง นับ 1-10.....ให้รู้สึก

หายใจเข้า เกร็งกล้ามเนื้อสะโพกทางด้านในในขณะที่พยายามหุบขาเข้าค้างไว้นับ1-10.... ให้รู้สึก

หายใจออก คลายกล้ามเนื้อสะโพกทางด้านในโดยวางขาราบบนเตียง นับ 1-10.....ให้รู้สึก

ทำสลับกัน ต่อไปเรื่อย ๆ 15 ครั้งต่อรอบ 3 รอบต่อวัน.....ให้มีความรู้สึก

<u>กิจกรรมย่อยที่ 4</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อที่ใช้ในการเหยียดเข่าและงอเข่าท่าที่1

นอนหงายบนเตียง ขาวางราบบนพื้นเตียง..... ให้รู้สึก

หายใจเข้า เกร็งกล้ามเนื้อเหนือข้อเข่า

โดยกดเข่าลงกับเตียง ค้างไว้

นับ 1-10 .....ให้รู้สึก

หายใจออก คลายกล้ามเนื้อเหนือข้อเข่า

โดยวางขาราบบนเตียง

นับ 1-10.....ให้รู้สึก

ทำสลับกันต่อไปเรื่อย ๆ 15ครั้งต่อรอบ

3 รอบต่อวัน..... ให้มีความรู้สึกตัว

<u>กิจกรรมย่อยที่ 5</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อที่ใช้ในการเหยียดเข่าและงอเข่าท่าที่ 2

นอนหงายบนเตียง ขาวางราบบน

พื้นเตียง..... ให้รู้สึก

หายใจเข้า เกร็งกล้ามเนื้อใต้ข้อพับโดย

ถีบปลายเท้าลงกับเตียง ค้างไว้

นับ 1-10 .....ให้รู้สึก

หายใจออก คลายกล้ามเนื้อใต้ข้อพับ

โดยวางขาราบบนเตียง

นับ 1-10.....ให้รู้สึก

ทำต่อไปเรื่อย ๆ 15 ครั้งต่อรอบ

3 รอบต่อวัน..... ให้มีความรู้สึกตัว

<u>กิจกรรมย่อยที่ 6</u>การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายของข้อเท้า ท่าที่ 1

นอนหงายบนเตียง ขาวางราบบน

พื้นเตียง.....ให้รู้สึกตัว

กระดกข้อเท้าขึ้น-ลง สลับกัน.....ให้รู้สึก

ทำแต่ละท่าต่อไปเรื่อย ๆ 30 ครั้งต่อรอบ 3 รอบต่อวัน.....ให้มีความรู้สึกตัว

<u>กิจกรรมย่อยที่ 7</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายของข้อเท้า ท่าที่ 2

นอนหงายบนเตียง ขาวางราบพื้นเตียง.....ให้รู้สึก

กระดกนิ้วเท้าขึ้น-ลง สลับกัน.....ให้รู้สึก

ทำต่อไปเรื่อย ๆ 30 ครั้งต่อรอบ 3 รอบต่อวัน.....ให้มีความรู้สึกตัว

<u>กิจกรรมที่ 8</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการยืนและเดินด้วยไม้ค้ำยัน

การวางไม้ค้ำยัน: ให้ปลายไม้ค้ำยันออกห่างจากลำตัวยื่นมาทางด้านหน้าประมาณ 30 องศาและวางไม้ค้ำยันให้มีช่วงห่างทางด้านข้างจากลำตัวประมาณหนึ่งช่วงไหล่

วางไม้ค้ำยันไว้ใต้รักแร้...ให้รู้สึก

จับไม้ค้ำยันโดยให้ข้อศอกงอเล็กน้อยประมาณ 15 องศา

เคลื่อนไม้ค้ำยันไปทางด้านหน้า...ให้รู้สึก

ก้าวขาข้างที่กระดูกหักไปด้านหน้า ให้เสมอกับระดับไม้ค้ำยัน โดยไม่มีการลงน้ำหนัก.....

ให้รู้สึก

ออกแรงกดที่มือทั้งสองข้างพร้อมกัน...ให้รู้สึก

ยกตัวเคลื่อนไปข้างหน้า...ให้รู้สึก

<u>กิจกรรมที่ 9</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการเดินขึ้นบันไดด้วยไม้ค้ำยัน

วางไม้ค้ำยันไว้ใต้รักแร้...ให้รู้สึก

จับไม้ค้ำยันโดยให้ข้อศอกงอเล็กน้อยประมาณ

15องศา...ให้รู้สึก

ยืนชิดบันไดขั้นที่จะก้าวขึ้นไป...ให้รู้สึก

ก้าวเท้าข้างที่ดีขึ้นบันได....ให้รู้สึก

ลงน้ำหนักที่ขาข้างที่ดีพร้อมกับยืนทรงตัว...

ให้รู้สึก

ยกไม้ค้ำยันขึ้นบันไดพร้อมกับก้าวขาข้างที่หัก

ตาม...ให้รู้สึก

<u>กิจกรรมย่อยที่ 10</u> การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการเดินลงบันไดด้วยไม้ค้ำยัน

วางไม้ค้ำยันไว้ใต้รักแร้...ให้รู้สึก

เลื่อนไม้ค้ำยันทั้งสองข้างลงบันไดก่อน...ให้รู้สึก

ยกตัวขึ้น ก้าวขาข้างที่หักลงบันได...ให้รู้สึก

ก้าวขาข้างที่ดีลงตาม....ให้รู้สึก

ตารางทำกิจกรรมตามโปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติ

จากแนวทางการจัดการความเครียดเฉียบพลัน (Acute stress) เพื่อป้องกันความเครียดภายหลังเหตุการณ์สะเทือนขวัญ (Posttraumatic stress disorder) (Nash, & Watson, 2012) เสนอว่า หลังเหตุการณ์รุนแรง ควรจะมีการประเมินความเครียดเฉียบพลันภายในวันที่ 4 ของการบาดเจ็บ หากพบอาการของภาวะเครียดเฉียบพลันนานกว่าหรือเท่ากับหนึ่งเดือนแต่ไม่เกิน 3 เดือน ถือว่า ผู้ป่วยมีภาวะเครียดภายหลังเหตุการณ์สะเทือนขวัญอย่างเฉียบพลัน (Acute posttraumatic stress disorder) และหากภาวะดังกล่าวเกิดขึ้นต่อเนื่องนานเท่ากับหรือมากกว่า 3 เดือน ถือว่าผู้ป่วยมีภาวะเครียดภายหลังเหตุการณ์สะเทือนขวัญแบบเรื้อรัง (chronic posttraumatic stress disorder) และหลาย ๆ งานวิจัยพบว่า ปฏิกิริยาความเครียดเฉียบพลัน เป็นปัจจัยทำนายว่าผู้ป่วยจะมีความเครียดภายหลังเหตุการณ์สะเทือนขวัญ (Bryant, 2003)

ผู้เขียนได้ประยุกต์แนวทางการจัดการความเครียดเฉียบพลันฯ ดังกล่าวมาใช้ในการกำหนดกิจกรรมกล่าวคือ จะต้องมีการประเมินภาวะจิตใจภายหลังการบาดเจ็บภายในวันที่ 3 ของการบาดเจ็บ และจะต้องหาจัดกิจกรรมแก่ผู้ป่วยภายใน 1 เดือนหลังการบาดเจ็บ แนวทางการดำเนินกิจกรรมตามโปรแกรมการบูรณาการบำบัดด้วยการฝึกสติร่วมกับการฟื้นฟูสมรรถภาพผู้ป่วยกระดูกรยางค์ล่างบาดเจ็บ แสดงรายละเอียดตามตารางที่ 1

ตารางที่ 1 กิจกรรมตามโปรแกรมการฟื้นฟูทางการพยาบาลร่วมกับการฝึกสติ

ช่วงเวลา	สถานที่	กิจกรรม
วันที่ 3 หลังการบาดเจ็บ	หอผู้ป่วยศัลยกรรมกระดูก	1.ประเมินข้อมูลพื้นฐาน และลักษณะการบาดเจ็บด้วยแบบสอบถาม ลักษณะทั่วไปและลักษณะการบาดเจ็บของกลุ่มตัวอย่าง (Demographic Data Questionnaire, DDQ) 2. ประเมินความสามารถในการทำหน้าที่ของร่างกาย โดยวัดค่าความแข็งแรงของกล้ามเนื้อ และพิสัยการเคลื่อนไหวของข้อสะโพกและข้อเข่า 3. ประเมินภาวะบีบคั้นด้านจิตใจ โดยใช้แบบประเมิน Brief Symptom Inventory-18 (BSI-18) 4. ประเมินความผาสุกจิตวิญญาณ โดยใช้เครื่องมือ Spirituality Index Well-Being (SIWB) 5.ผู้ป่วยจะได้รับความรู้จากกิจกรรมที่ 1 และ 2 ของ โปรแกรมผ่าน DVD และฝึกปฏิบัติตาม DVD
หลังจากเอาสายระบายออกจากแผล	แผนกกายภาพบำบัด หอผู้ป่วยศัลยกรรมกระดูก	1. ผู้ป่วยจะถูกส่งไปแผนกกายภาพบำบัดเพื่อฝึกการใช้ไม้ค้ำยัน การออกกำลังตามโปรแกรมฟื้นฟูสมรรถภาพ และนำไปปฏิบัติด้วยตัวเองเมื่อกลับบ้าน 2.ผู้ป่วยได้รับความรู้ในกิจกรรมที่ 3 ของ โปรแกรมผ่าน DVD และฝึกปฏิบัติตาม DVD
1 สัปดาห์หลังออกจากโรงพยาบาล	บ้านผู้ป่วย	ผู้ป่วยจะได้รับโทรศัพท์เพื่อสอบถามการปฏิบัติตามโปรแกรม รวมถึงการประเมินปัญหาและอุปสรรคที่เกิดขึ้นจากการปฏิบัติ

ตารางที่ 1 (ต่อ)

ช่วงเวลา	สถานที่	กิจกรรม
1เดือนหลังการบาดเจ็บ	บ้านผู้ป่วย	1. ประเมินความสามารถในการทำหน้าที่ของร่างกาย โดยวัดระดับความแข็งแรงของกล้ามเนื้อ และ พิสัยการเคลื่อนไหวของข้อสะโพกและข้อเข่า 2. ประเมินภาวะบีบคั้นด้านจิตใจ โดยใช้แบบประเมิน Brief Symptom Inventory-18 (BSI-18) 3. ประเมินความผาสุกจิตวิญญาณโดยใช้เครื่องมือ Spirituality Index Well-Being (SIWB)
3 เดือนหลังการบาดเจ็บ	บ้านผู้ป่วย	1. ประเมินความสามารถในการทำหน้าที่ของร่างกาย โดยวัดระดับความแข็งแรงของกล้ามเนื้อ และ พิสัยการเคลื่อนไหวของข้อสะโพกและข้อเข่า 2. ประเมินภาวะบีบคั้นด้านจิตใจ โดยใช้แบบประเมิน Brief Symptom Inventory-18 (BSI-18) 3. ประเมินความผาสุกจิตวิญญาณโดยใช้เครื่องมือ Spirituality Index Well-Being (SIWB)

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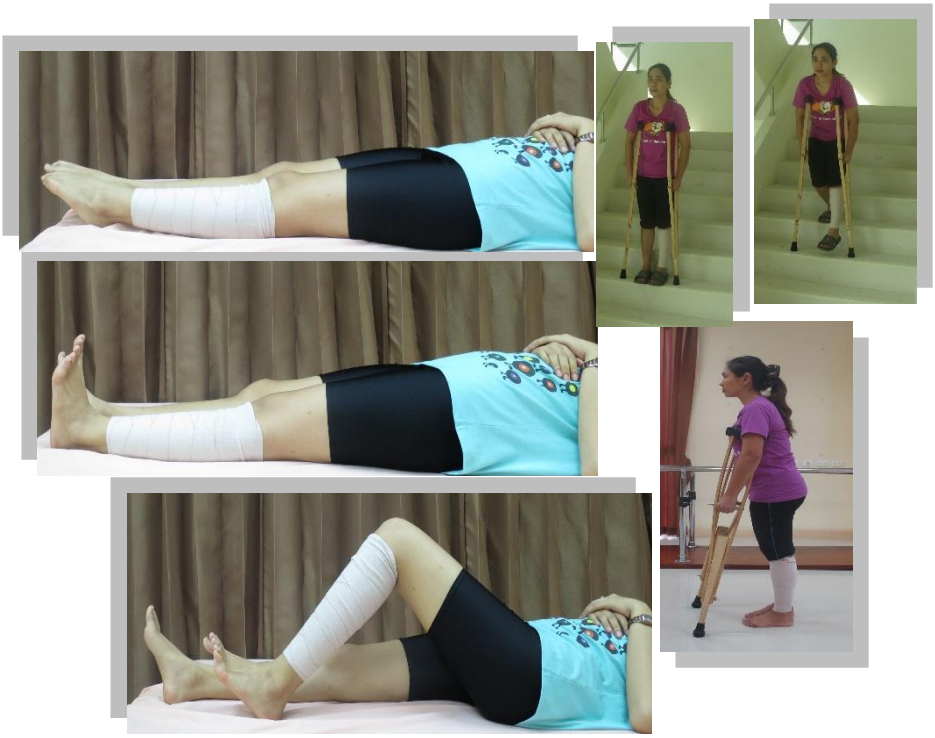
Appendix D

Luangpor Teean's awareness- mindfulness meditation with exercise program booklet

การบูรณาการการฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการฟื้นฟูสมรรถภาพร่างกาย



จัดทำโดย

นางสาวชิดชนก มยูรภักดิ์

นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาการพยาบาล (นานาชาติ)

คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์

“การบูรณาการการฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการฟื้นฟูสมรรถภาพร่างกาย”

การรักษาภาวะกระดูกรยางค์ล่างบาดเจ็บ ไม่ได้สิ้นสุดเพียงแค่การจำกัดการเคลื่อนไหว การจัดกระดูกหรือการผ่าตัดเท่านั้น ช่วงเวลาที่รอการฟื้นหายของกระดูก จำเป็นต้องมีกระบวนการฟื้นฟูสมรรถภาพเพื่อป้องกันการบกพร่องทางร่างกายที่อาจจะเกิดขึ้นภายหลังการบาดเจ็บ

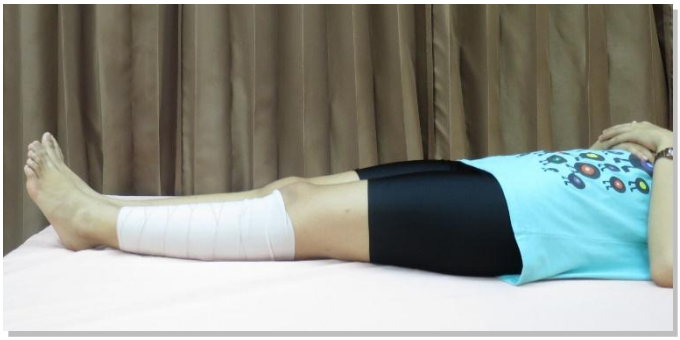
การบกพร่องทางร่างกายภายหลังการบาดเจ็บ เป็นปัจจัยสำคัญที่มีผลต่อการกลับไปทำงานหรือทำหน้าที่ทางสังคมของผู้ป่วยกลุ่มนี้ กระบวนการฟื้นฟูสมรรถภาพ จะช่วยให้ผู้ป่วยมีการฟื้นหายเร็วขึ้น สามารถกลับไปทำงานหรือทำกิจกรรมทางสังคมได้เหมือนเดิมหรือใกล้เคียงก่อนการบาดเจ็บ ภายในเวลาที่เหมาะสม

โปรแกรมฟื้นฟูสมรรถภาพแม้จะมีความสำคัญ แต่หากต้องปฏิบัติภายใต้สภาวะจิตใจที่เปราะบาง ประสิทธิภาพของโปรแกรมย่อมลดลง ดังนั้นการบูรณาการการฝึกสติร่วมกับการฟื้นฟูสมรรถภาพร่างกาย จะช่วยส่งเสริมให้ผู้ป่วยมีสภาวะจิตใจที่เข้มแข็งขึ้นภายหลังการบาดเจ็บ มีสติอยู่กับการปฏิบัติตามโปรแกรมฟื้นฟูสมรรถภาพ เกิดการปฏิบัติตามโปรแกรมอย่างต่อเนื่อง

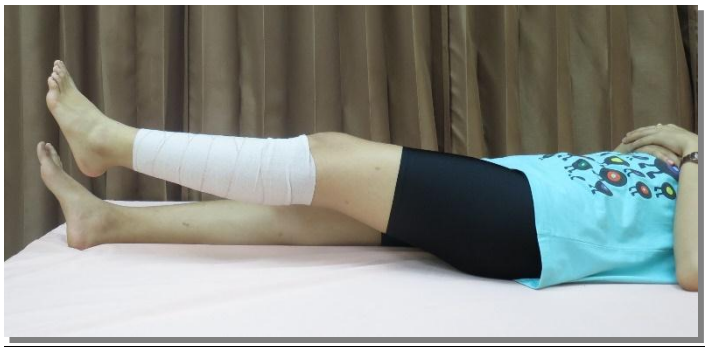
กิจกรรมการบูรณาการการฝึกสติตามแนวทางหลวงพ่อเทียน

ร่วมกับการฟื้นฟูสมรรถภาพร่างกาย

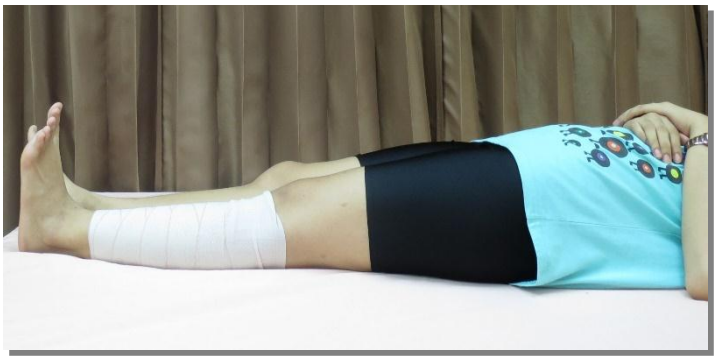
1. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อรอบข้อสะโพกท่าที่ 1



นอนหงายบนเตียง ขาวางราบกับพื้นเตียง.....ให้รับรู้ความรู้สึก



หายใจเข้า เกร็งกล้ามเนื้อสะโพกด้านหน้าโดยออกแรงยกขาขึ้นค้างไว้ นับ 1-5.....ให้รับรู้ความรู้สึก



หายใจออก คลายกล้ามเนื้อสะโพกด้านหน้าโดยวางขาราบบนเตียง

นับ 1-5……..ให้รับรู้ความรู้สึก

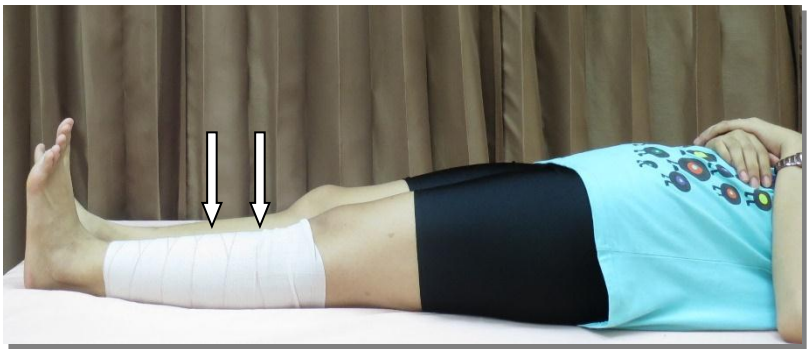
ทำสลับกันต่อไปเรื่อยๆ 5 ครั้งต่อรอบ

ทำวันละ 3 ครั้งเช้า-เที่ยง-เย็น

2 .การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อรอบข้อสะโพกท่าที่ 2

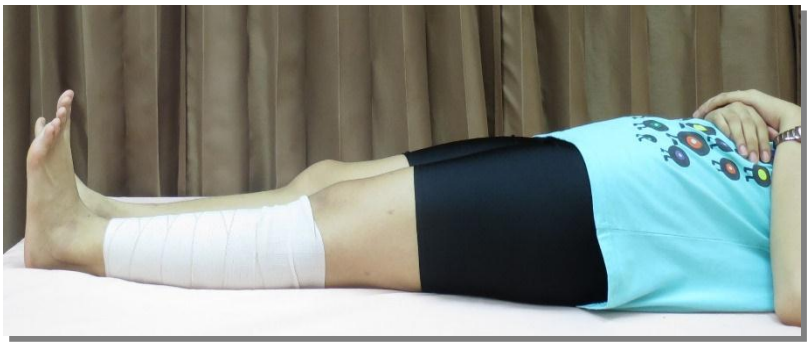
นอนหงายบนเตียง ขาวางราบกับพื้นเตียง

..... ให้รับรู้ความรู้สึก



หายใจเข้า เกร็งกล้ามเนื้อสะโพกด้านหลังโดยกดขาลงกับเตียงค้างไว้

นับ 1-5 .....ให้รับรู้ความรู้สึก



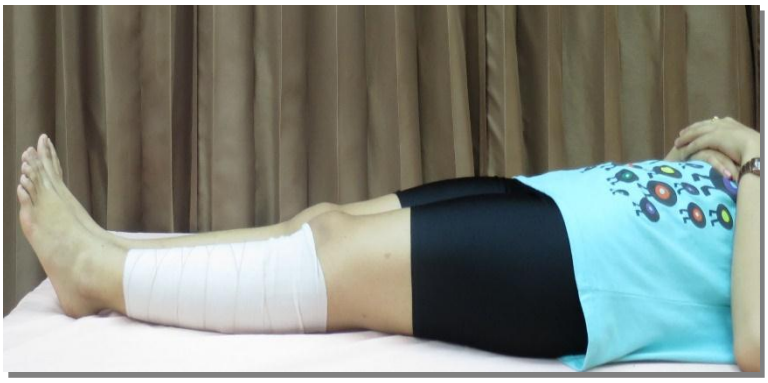
หายใจออก คลายกล้ามเนื้อสะโพกด้านหลัง โดยวางขาราบบนเตียง

นับ 1-5……...ให้รับรู้ความรู้สึก

ทำสลับกันต่อไปเรื่อยๆ 5 ครั้งต่อรอบ

ทำวันละ 3 ครั้งเช้า-เที่ยง-เย็น

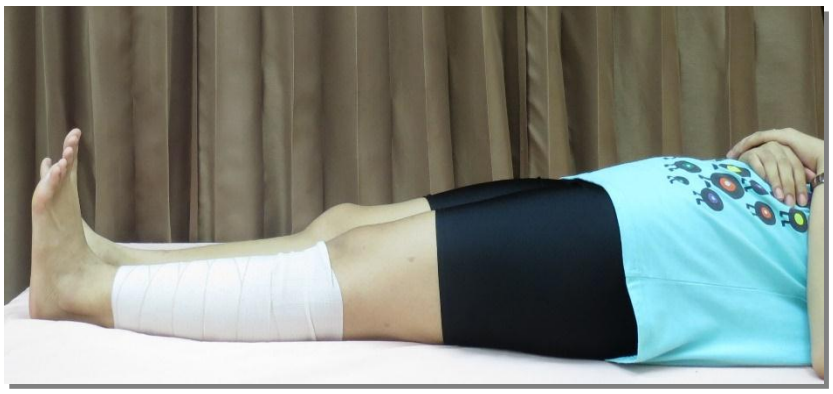
3. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อรอบข้อสะโพกท่าที่ 3



นอนหงายบนเตียง ขาวางราบกับพื้นเตียง.....ให้รับรู้ความรู้สึก

หายใจเข้า เกร็งกล้ามเนื้อสะโพกทางด้านนอกในขณะที่พยายามกางขาออกค้างไว้

นับ 1-5..... ให้รับรู้ความรู้สึก

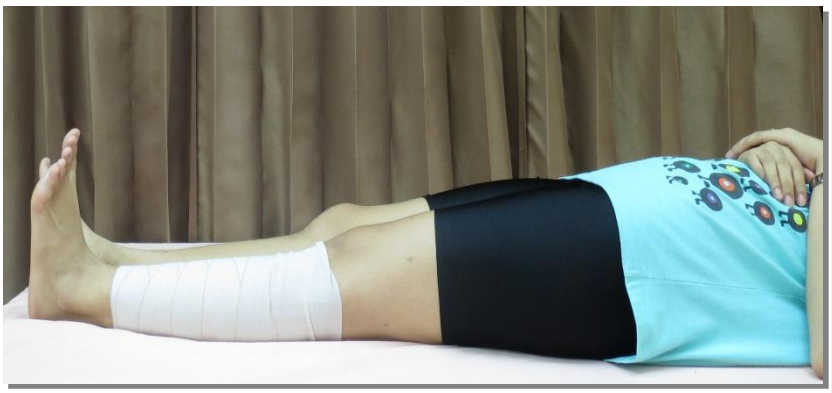


หายใจออก คลายกล้ามเนื้อสะโพกทางด้านนอกโดยวางขาราบบนเตียง

นับ 1-5……ให้รับรู้ความรู้สึก

หายใจเข้า เกร็งกล้ามเนื้อสะโพกทางด้านในในขณะที่พยายามหุบขาเข้า

ค้างไว้นับ 1-5..... ให้รับรู้ความรู้สึก



หายใจออก คลายกล้ามเนื้อสะโพกทางด้านในโดยวางขาราบบนเตียง

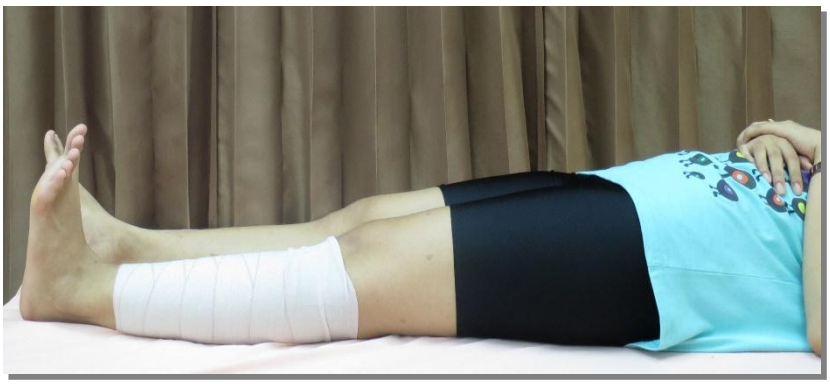
นับ 1-5…….....ให้รับรู้ความรู้สึก

ทำสลับกัน ต่อไปเรื่อย ๆ5 ครั้งต่อรอบ

ทำวันละ 3 ครั้งเช้า-เที่ยง-เย็น

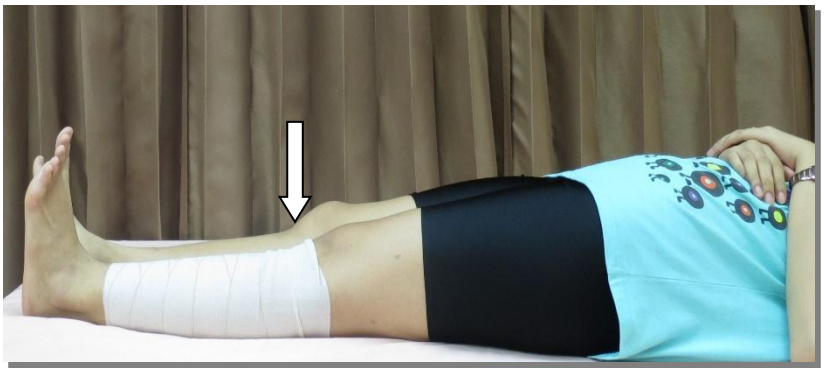
4. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อที่ใช้ในการเหยียดเข่าและงอเข่าท่าที่1

นอนหงายบนเตียง ขาวางราบบนพื้นเตียง.....ให้รับรู้ความรู้สึก



หายใจเข้า เกร็งกล้ามเนื้อเหนือข้อเข่าโดยกดเข่าลงกับเตียง ค้างไว้

นับ 1-5.....ให้รับรู้ความรู้สึก

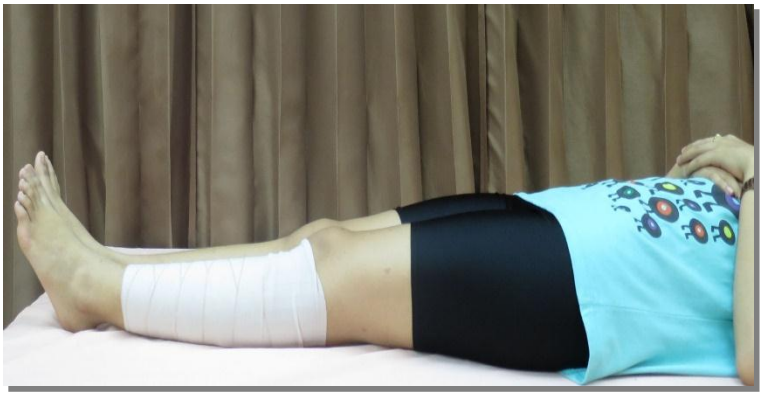


หายใจออก คลายกล้ามเนื้อเหนือข้อเข่าโดยวางขาราบบนเตียง

นับ 1-5…....ให้รับรู้ความรู้สึก

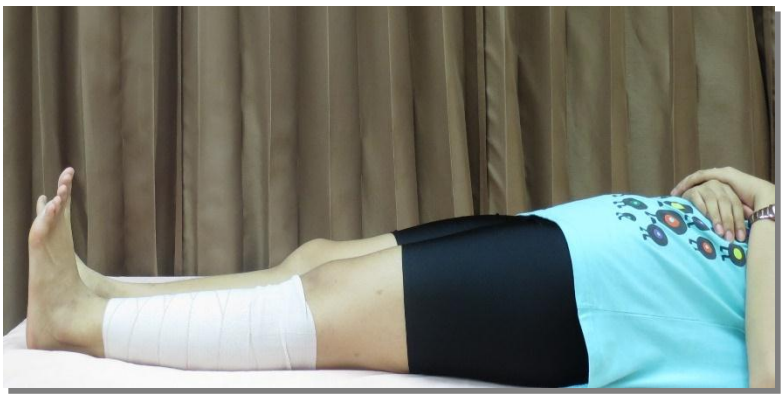
ทำสลับต่อไปเรื่อย ๆ 5 ครั้งต่อรอบทำวันละ 3 ครั้งเช้า-เที่ยง-เย็น

5. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายกล้ามเนื้อที่ใช้ในการเหยียดเข่าและงอเข่าท่าที่ 2



นอนหงายบนเตียง ขาวางราบบนพื้นเตียง.....ให้รับรู้ความรู้สึก

หายใจเข้า เกร็งกล้ามเนื้อใต้ข้อพับโดยยกเข่าขึ้นเท่าที่ทำได้ ค้างไว้นับ 1-5 .....ให้รับรู้ความรู้สึก

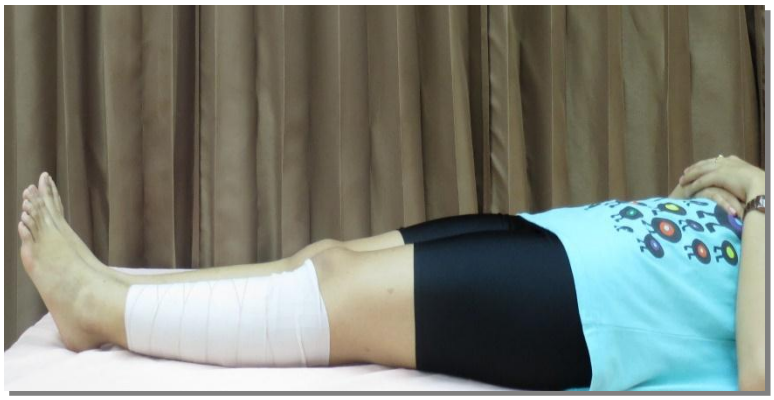


หายใจออก คลายกล้ามเนื้อใต้ข้อพับ โดยวางขาราบบนเตียง

นับ 1-5…….....ให้รับรู้ความรู้สึก

ทำต่อไปเรื่อย ๆ 5 ครั้งต่อรอบ วันละ 3 ครั้ง เช้า-เที่ยง-เย็น

6. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายของข้อเท้า ท่าที่ 1



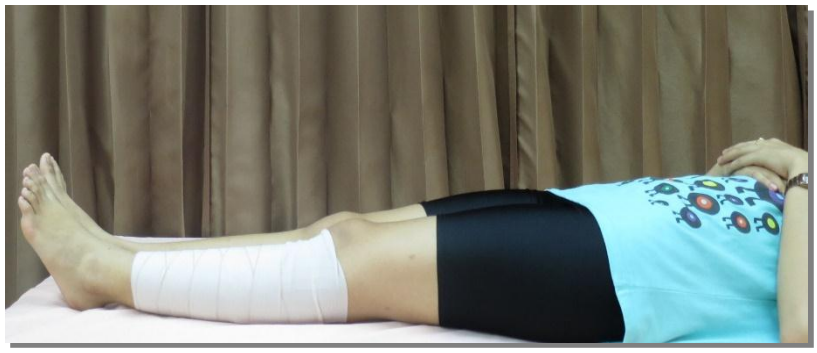
นอนหงายบนเตียง ขาวางราบบนพื้นเตียง……ให้รับรู้ความรู้สึกตัว

กระดกข้อเท้าขึ้น-ลง สลับกัน.....ให้รับรู้ความรู้สึก

ทำแต่ละท่าต่อไปเรื่อย ๆ 10 ครั้งต่อรอบ

ทำวันละ 3 ครั้งเช้า-เที่ยง-เย็น

7. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการออกกำลังกายของข้อเท้า ท่าที่ 2



นอนหงายบนเตียง ขาวางราบพื้นเตียง……ให้รับรู้ความรู้สึก

กระดกนิ้วเท้าขึ้น-ลง สลับกัน.....ให้รับรู้ความรู้สึก

ทำต่อไปเรื่อย ๆ 10 ครั้งต่อรอบ

ทำวันละ 3 ครั้งเช้า-เที่ยง-เย็น

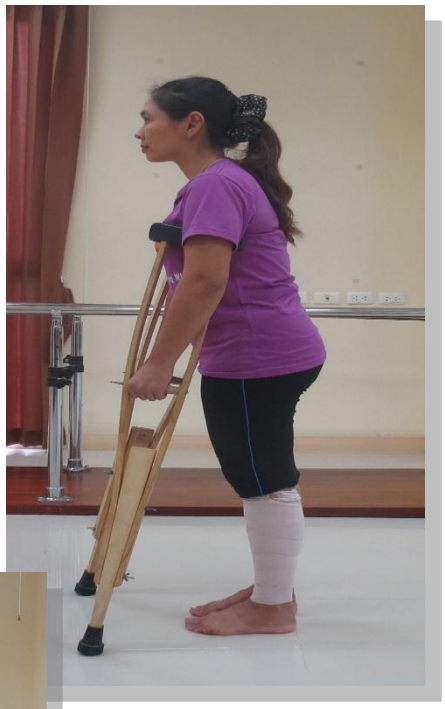
8. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการยืนและเดินด้วยไม้ค้ำยัน

การวางไม้ค้ำยัน: ให้ปลายไม้ค้ำยันออกห่างจากลำตัวยื่นมาทางด้านหน้าประมาณ 30 องศาและวางไม้ค้ำยันให้มีช่วงห่างทางด้านข้างจากลำตัวประมาณหนึ่งช่วงไหล่

วางไม้ค้ำยันไว้ใต้รักแร้.....ให้รับรู้ความรู้สึก

จับไม้ค้ำยันโดยให้ข้อศอกงอเล็กน้อยประมาณ 15 องศา.....ให้รับรู้ความรู้สึก

เคลื่อนไม้ค้ำยันไปทางด้านหน้า……..ให้รับรู้ความรู้สึก



ก้าวขาข้างที่บาดเจ็บไปด้านหน้า ให้เสมอกับระดับไม้ค้ำยัน โดยไม่มีการลงน้ำหนักขาข้างที่บาดเจ็บ.....

ให้รับรู้ความรู้สึก

ออกแรงกดที่มือทั้งสองข้าง

พร้อมกัน……ให้รับรู้ความรู้สึก

ยกตัวเคลื่อนไปข้างหน้า…ให้รับรู้ความรู้สึก

9. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการเดินขึ้นบันไดด้วยไม้ค้ำยัน

วางไม้ค้ำยันไว้ใต้รักแร้.....ให้รับรู้ความรู้สึก
จับไม้ค้ำยันโดยให้ข้อศอกงอเล็กน้อยประมาณ 15 องศา.....ให้รับรู้ความรู้สึก
ยืนชิดบันไดขั้นที่จะก้าวขึ้นไป...ให้รับรู้ความรู้สึก

ก้าวเท้าข้างที่ดีขึ้นบันไดก่อน....ให้รับรู้ความรู้สึก
ลงน้ำหนักที่ขาข้างที่ดีพร้อมกับยืนทรงตัว.....ให้รับรู้ความรู้สึก

ยกไม้ค้ำยันขึ้นบันไดพร้อมกับก้าวขาข้างที่บาดเจ็บตาม…ให้รับรู้ความรู้สึก

10. การฝึกสติตามแนวทางหลวงพ่อเทียนร่วมกับการเดินลงบันไดด้วยไม้ค้ำยัน

วางไม้ค้ำยันไว้ใต้รักแร้…ให้รับรู้ความรู้สึก

เลื่อนไม้ค้ำยันทั้งสองข้างลงบันได

ก่อน.....ให้รับรู้ความรู้สึก

ยกตัวขึ้น ก้าวขาข้างที่บาดเจ็บ

ลงบันได .....ให้รับรู้ความรู้สึก

ก้าวขาข้างที่ดีลงตาม....ให้รับรู้ความรู้สึก

ขอขอบคุณ

รองศาสตราจารย์ ดร.ประณีต ส่งวัฒนา

ผู้ช่วยศาสตราจารย์ ดร.วงจันทร์ เพชรพิเชฐเชียร

คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์

อาจารย์ ดร. ประภัสสร คลังสิน

สำนักวิชาสหเวชศาสตร์และสาธารณสุขศาสตร์ มหาวิทยาลัยวลัยลักษณ์

คลินิกกายภาพบำบัด มหาวิทยาลัยวลัยลักษณ์

.....

Appendix E

Permission of Using the Study Instruments

Part 1: Permission of translation and using Brief Symptom Inventory-18 (BSI-18)

On Thursday, 23 March 2017, 1:51, "Licensing, -"
> <pas.licensing@pearson.com> wrote:

Dear Ms. Mayurapak,
Your request to use the BSI 18 in your research has been approved. We have attached a license agreement 13763-P for your review and approval. You may make edits using track changes. If you approve as is, please print, sign and email me a pdf of the signed agreement for counter signature. If you need original signatures, please print one copy, sign, and return to me at: PearsonAttn: Linda Murphy NA

Contracts19500 Bulverde Road #201San Antonio, TX 78259 I will return a fully executed agreement for your file. Also, an invoice will be sent once the agreement has been fully signed. Thank you for your assistance.
Regards,
Linda Murphy
Licensing Analyst
Pearson19500 Bulverde Road
#201San Antonio, TX 78259
please respond only to pas.licensing@pearson.com

Part 2: Permission of translation and using Spirituality Index Well-Being (SIWB)

On Wednesday, 20 May 2015, 15:53, chidchanog mayurapak <chidchanog_m@yahoo.com> wrote:

Dear Professor Dr Tim Daaleman,

Thank you very much for your e-mail and your permission to translate the SIWB in to Thai language. If you have any suggestion about using this tool please let me know.

Best regards,
Chidchanog Mayurapak

Chidchanog Mayurapak
Ph.D. student
Faculty of Nursing
Prince of Songkla University
Hatyai campus, Songkhla
Thailand 90112
Mobile: +66 86-595-1114

On Tuesday, 19 May 2015, 19:06, "Daaleman, Tim" <tim_daaleman@med.unc.edu> wrote:

Dear Chidchanog,

The SIWB is in the public domain and you have our permission to use the scale.

There is no specific cut-point in the scale and I have included some relevant articles to help you with your research.

Best wishes, Tim Daaleman

From: chidchanog mayurapak [mailto:chidchanog_m@yahoo.com]
Sent: Tuesday, May 19, 2015 12:43 AM
To: Daaleman, Tim
Subject: the letter ask permission to translate SIWB

Appendix F

List of Experts

This study involved five experts to evaluate content validity of research instrument (RIMBT program), and four experts to translate research instruments (BSI-18 and SIWB), as follows:

1. Dr. Chantrarat Vongareesawat

   Department of Psychiatric Nursing, Faculty of Nursing, Navamindradhiraj University, Thailand.

2. Assoc. Prof. Dr. Urai Hatthakit

   Department of Nursing Administration and Nursing Service, Faculty of Nursing, Prince of Songkla University, Thailand.

3. Asst. Prof. Dr.Tippamas Chinnawong

   Department of Medical Nursing, Faculty of Nursing, Prince of Songkla University, Thailand.

4. Dr. Praphatson Klangsin

   School of Allied Health Science, Walailak University, Thailand.

5. Phrasuwan Suvaṇṇo (Ruangdej)

   Wat Nong Waeng, Thailand.

6. Asst. Prof. Dr. Ladda Thiamwong

   College of Nursing, University of Central Florida, Orlando, Florida, USA.

7. Asst. Prof. Dr. Supattra Buitee

   Department of Adult Nursing, Faculty of Nursing, Mahasarakham University, Thailand

8. Dr. Wararat Whanchit

School of Liberal Art, Walailak University, Thailand.

9. Dr. Michael McManus

School of Teaching, Learning, and Leadership, University of Central Florida, Orlando, Florida, USA.

VITAE

Name Chidchanok Mayurapak

Student ID 5410430002

Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing	Mahidol University	1997
Master of Nursing Science	Mahidol University	2005

Scholarship Awards during Enrolment

The partial funding support provided by Walailak University

Work – Position and Address

Lecturer, School of Nursing Walailak University
222 Thai buri Thasala Nakhon Si Thammarat
Thailand 80160
Mobile: +66865951114
Email: mchidch@wu.ac.th, chidchanog_m@yahoo.com

List of Publication and Proceeding

Mayurapak, C., Songwathana, P., & Petpichetchian, W. (in press). The Mindfulness-Based Nursing Rehabilitation Program (MNRP) among Thai Buddhist with Lower Extremity Injury: A Pilot Study. *The Southern College Network Journal of Nursing and Public Health*. Retrieved from https://www.tci-thaijo.org/index.php/scnet**.**

Mayurapak, C., Songwathana, P., & Petpichetchian, W. (2016). *Development of the Rehabilitation Program Integrating Buddhist-based Teaching for Thai Buddhist Women with Lower Extremity Injury.* Oral presentation at The 21st International Council on Women's Health Issues Congress Scale and Sustainability: Moving Women's Health Forward. Bultimore, Maryland (USA).