PAIN, PAIN MANAGEMENT, AND SATISFACTION WITH PAIN MANAGEMENT IN TOTAL ABDOMINAL HYSTERECTOMY PATIENTS

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Thesis
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PAIN, PAIN MANAGEMENT, AND SATISFACTION WITH PAIN MANAGEMENT IN TOTAL ABDOMINAL HYSTERECTOMY PATIENTS

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ABSTRACT

This was descriptive research aimed to studying 1) Pain after total abdominal hysterectomy in the first 3 days. 2) Pain management method.3) The effect of pain on activities of daily living. And 4) Satisfaction of patients with pain management that they received based on the conceptual framework of symptom management developed by Dodd et al. The samples were patients admitted in the gynecological ward and private obstetrics ward of Ramathibodi Hospital from October to November 2006. There were 110 cases, chosen by purposive sampling.Demographic data, and data on pain was collected through The American Pain Society Questionnaire (1995) which was selected though a literature review.

The results were that 1) On postoperative day 1 most samples on average had pain in the high level and low level on postoperative day 2 and day 3. 2) Pain management method that the patients most used was turning their position for comfort. Pain management method that the doctor and nurse most used was to be interested and ask about pain. For pain management method by using medicine, it was found that in postoperative day 1 the samples received pethidine injection and Dynastat® injection. The efficiency of total pain management method to relieve pain was high level. 3) Pain affected for activities of daily living after surgery in relation to coughing and deep breathing, movement, sleep, emotion, other activities, relationship with other person at a low level. 4) Patients had satisfaction with the pain management that they received from doctors, nurses and over all at a high level.

KEY WORDS: PAIN / PAIN MANAGEMENT / SATISFACTION WITH PAIN MANAGEMENT / TOTAL ABDOMINAL HYSTERECTOMY

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ความปวด การจัดการกับความปวดและความพึงพอใจต่อการจัดการกับความปวดในผู้ป่วยหลังผ่าตัดมดลูกออกทางหน้าท้อง (PAIN, PAIN MANAGEMENT, AND SATISFACTION WITH PAIN MANAGEMENT IN TOTAL ABDOMINAL HYSTERECTOMY PATIENTS)

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บทคัดย่อ

การวิจัยเชิงบรรยายนี้มีวัตถุประสงค์เพื่อศึกษา 1) ความปวดใน 3 วันแรกหลังผ่าตัดมดลูกออกทางหน้าท้อง 2) วิธีจัดการกับความปวด 3) ผลของความปวดต่อการปฏิบัติกิจวัตรประจำวัน และ 4) ความพึงพอใจของผู้ป่วยต่อการจัดการกับความปวดที่ได้รับ โดยใช้กรอบแนวคิดการจัดการกับอาการของดอดด์และคณะ กลุ่มตัวอย่างเป็นผู้ป่วยที่เข้ารับการรักษาหอผู้ป่วยนรีเวชและหอผู้ป่วยสูติกรรมพิเศษ โรงพยาบาลรามาธิบดี ระหว่างเดือนตุลาคมถึงเดือนพฤศจิกายน พ.ศ. 2549 จำนวน 110 ราย เลือกตัวอย่างแบบเจาะจงตามคุณสมบัติที่กำหนด เก็บข้อมูลโดยใช้แบบบันทึกข้อมูลส่วนบุคคล แบบประเมินความปวดที่ผู้วิจัยพัฒนามาจากแบบประเมินผู้ป่วยของสมาคมความปวดแห่งประเทศสหรัฐอเมริกา และแบบสอบถามวิธีจัดการกับความปวดที่สร้างขึ้นจากการทบทวนวรรณกรรม

ผลการวิจัยพบว่า 1)ในวันแรกหลังผ่าตัดผู้ป่วยมีค่าเฉลี่ยของความปวดสูงสุดอยู่ในระดับสูง วันที่ 2 และ 3 หลังผ่าตัดอยู่ในระดับต่ำ 2) วิธีการจัดการกับความปวดที่ผู้ป่วยใช้มากที่สุดคือ พลิกตัวให้อยู่ในท่าที่สบาย วิธีจัดการกับความปวดที่แพทย์และพยาบาลใช้มากที่สุดคือ ให้ความสนใจและถามถึงอาการปวด สำหรับวิธีจัดการกับความปวดด้วยยาพบว่า ในวันแรกหลังผ่าตัดผู้ป่วยได้รับยาเพทิดีนและยาไดนาสแตทชนิดฉีด วิธีจัดการกับความปวดในภาพรวมมีประสิทธิภาพในการบรรเทาความปวดในระดับสูง 3) ความปวดรบกวนการปฏิบัติกิจวัตรประจำวันหลังผ่าตัดในด้านการไอและการหายใจเข้าออกลึกๆ การเคลื่อนไหว การนอนหลับ อารมณ์ การทำกิจกรรมอื่นๆ และการมีสัมพันธภาพกับบุคคลอื่นในระดับต่ำ 4)ผู้ป่วยมีความพึงพอใจกับวิธีการจัดการกับความปวดที่ได้รับ จากแพทย์ พยาบาลและโดยรวมในระดับสูง

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CHAPTER I
INTRODUCTION

Background and Rationale

Hysterectomy is the most common gynecological operation in women. The indicators of hysterectomy as follows: 1) Benign disease such as leiomyomars, endometriosis, adenomyosis, chronic infection, adnexal mass. 2) Acute condition (emergencies) such as pregnancy catastrophe; severe postpartum hemorrhage, severe infection, operative complication. 3) Cancer or premalignant disease (know) such as invasive cancer, preinvasive cancer, adjacent or distant cancer. 4) Discomfort (chronic or recurrent) such as chronic pelvic pain, pelvic relaxation, stress urinary incontinence, abnormal uterine bleeding. 5) Extenuating circumstances such as sterization, Cancer prophylaxis. (Tingtanatikul & Srisombut, 2005; Jones, 2003), uterine rupture, uterine prolapse, and ectopic pregnancy (Jones, 2003).

According to the statistics of the top ten operations of Ramathibodi Hospital in 2003, total abdominal hysterectomy ranked second. When considering annual statistics, it was found that the numbers of patients who underwent total abdominal hysterectomy in 2002, 2003, and 2004 were equal to 965, 914, and 918, respectively (Data from the medical statistics unit of Ramathibodi Hospital, 2003). It could be seen that there are a large number of patients who undergo total abdominal hysterectomy at Ramathibodi Hospital each year.

Total abdominal hysterectomy is considered a major operation. The procedures can involve low midline, and pfannenstiel incision through the skin, subcutaneous fat, Scarpa's fascia, rectus sheath, rectus abdominis muscles, pyramidalis muscles, properitoneal fat, and peritoneum. After opening the abdomen of the patients whose uterus and ovaries need to be removed, the doctor will cut round ligament, infundibulo pelvic ligament, uterine vessels, uterosacral ligament, and Cardinal ligament (Baggish, 2001). Thus, such operation causes injuries of tissues, muscles,

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tendons, fascia, bloodvessels, and nerves (Gilstraps, Cunningham & Vandorsten, 2003). The following effect of such operation is pain ranging from moderate to severe pain (Gupta et al., 2004).

Good et al. (2000) carried out a study to investigate pain in 80 total hysterectomy patients during the first two days after surgery. They found that the sample had worst pain as follows: on the first postoperative day, they had severe pain and on the second postoperative day, they had moderate-severe pain. With regard to average pain, the pain level of the patients was at the moderate level on the first and second postoperative days. As for least pain, the sample had mild pain on both the first and the second postoperative days. In this study, it was also found that the pain level increased when the patients had body movement and decreased when the patients took a rest. About 30% of the patients reported that their pain disturbed their sleep during the first two days after the operation, and 65% indicated that pain made it hard for them to sleep on the first postoperative day.

Based on the study of Good et al., it can be summarized that pain disturbs movement and sleep of patients undergoing total abdominal hysterectomy. Such findings are consistent with the studies of Kanogsunthornrat (1992) and Chaikla (2002) conducted with patients undergoing abdominal operation, Potaros (1995) conducted with surgery patients, orthopedic patients, and gynecological patients, and Waiyanetta (1999) with postpartum patients. The findings of these studies revealed that pain disturbs body movement and sleep after the operation.

In addition to body movement and sleep, pain also disturbs emotional status and interpersonal relationships of the patients (Kanogsunthornrat, 1992; Waiyanetta, 1999; Phattawee, 1998).

How do total abdominal hysterectomy patients manage their pain? Based on the researcher's professional experience, it has been found that some patients lie still when they are in pain, while others inform the doctors or nurses and ask for painkillers. If the painkillers can not relieve their pain, they may request for them again.

As total abdominal hysterectomy is a major operation, the patients who have this operation will suffer from severe pain. The doctors generally plan to manage the patients' pain by administering opioids and informing the patients of the cause of pain

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and pain relief. They also reassure the patients that they can request for medications to relieve their pain as soon as they need them.

As for nurses who take care of the patients around the clock, the total abdominal hysterectomy patients expect that nurses will be able to relive their pain. In practice, nurses explain the cause of pain to the patients and tell them to ask for medicines to relieve their pain when they have pain. The nurses also administer pain medications according to the doctors' treatment plan. Moreover, nurses take care of these patients to further relieve their pain by paying attention to the pain the patients are suffering from, asking about their pain, assessing pain intensity, and providing comfort such as by positioning the patients, etc.

After doctors and nurses take care of total abdominal hysterectomy patients who are experiencing pain, the patients evaluate the outcomes of pain management. One way to assess the treatment outcomes is to assess patients' satisfaction with the services they receive. However, a review of literature shows that there are no studies which investigate the total abdominal hysterectomy patients' satisfaction with pain management that they receive. Based on this reason, the researcher was interested in examining pain intensity, pain management, affects of pain, and satisfaction with pain management of these groups of patients so as to subsequently provide appropriate nursing guidelines to help patients with total abdominal hysterectomy to manage their pain.

Theoretical Framework of the Study

The theoretical framework of this research is the Model of Symptom Management (Dodd et al., 2001) that was developed from the Symptom Management Model of Larson et al. (1994 cited in Dodd et al., 2001). The details of the theoretical framework as explained below.

Symptoms refer to individuals' experience regarding physical, psychological, social, and cognitive changes. They are personal-specific experiences which cause suffering

The Symptom Management Model consists of the following three interrelated dimensions:

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1. **Symptom experience** refers to individuals' perception of symptoms, interpretation of symptoms, and responses to symptoms. They are seen as emotional and behavioral responses which change from normal expressions. Symptom experience consists of the following:

1.1 Perception of symptoms is individuals' perception of changes that are different from what they used to do or feel. Such perception takes place when the individuals are conscious and through the process in which individuals think and give meaning to internal feelings to indicate their perception of the symptoms, which can be measured and expressed.

1.2 Evaluation of symptoms refer to individuals' evaluation of intensity, location, frequency, temporary or permanent treatment, and morbidity, depending on individuals' experience with symptoms whether such symptoms are life threatening or manageable or not.

1.3 Responses to symptoms refer to a total combination of physical, psychological, social, cultural, and behavioral aspects of individuals after the onset of problems. There may be more than one response to one symptom.

Symptom experience involves health and illness factors such as risks, health status, disease, and illness or disability which directly or indirectly affect symptom experiences, components of symptom management, and symptom outcomes.

2. **Component of symptom management strategies** is a dynamic process that constantly changes according to patients' perception. The aim of component of symptom management strategies is to deviate or slow down negative outcomes that may result from symptoms. Symptom management includes symptom management provide by healthcare team members and self-care practices. The management starts from assessing symptom experiences based on the patients' perspectives by specifying purposes of practice, intervention, and evaluation of practice. Symptom management also involves practice that is aimed at manipulating one factor related to symptom experience or more to achieve desired results. It may depend on acceptance and lack of acceptance of each method—what, when, where, why, how, how much, with whom, and with what effects? The principle of management depends on the level of knowledge for management, and there needs to be a balance between

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management and needs. If there is need, but management is ineffective, desired outcomes will not result.

Symptom management is related to environmental factors such as physical environment including residence, workplace, and hospital; social environment including social support; and cultural environment including beliefs, values, customs, raditions, race, and religion.

3. **Symptom outcomes** refer to the outcomes that result from symptom experience and methods of management which depend on eight components—state of symptoms, self-care, expenses, quality of life, rate of disease and cooperative factors of disease, mortality rate, emotional status, and functioning status. All symptom outcomes affect symptom conditions of individuals.

Symptom outcomes are related to personal factors such as general characteristics of individuals including gender and age; psychological characteristics such as personality, cognitive ability, and motivation; social characteristics such as family, culture, and religion; and physiological characteristics such as rest pattern, activity, and physical ability. Developmental of individuals is an internal factor of individuals to respond to symptom experiences.

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SYMPTOM MANAGEMENT MODEL

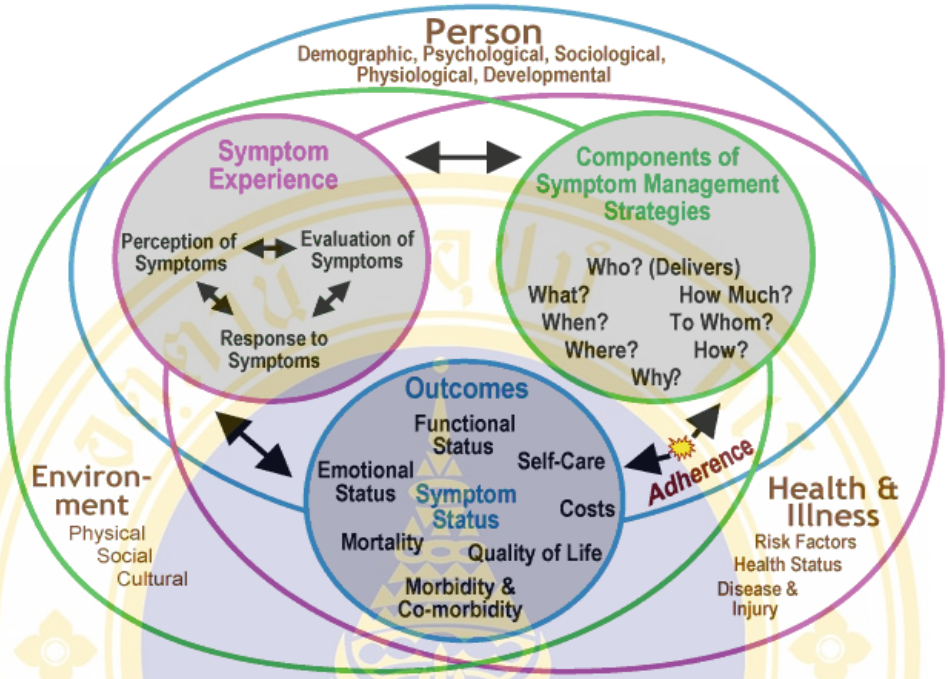

Figure 1: Theoritical Framework; Symptom Management Model proposed by Dodd M. et al, 2001.

Source: Journal of Advanced Nursing, 33(5) 2001: 668-676.

In the present study, the theory of symptom management proposed by Dodd was used as the theoretical framework to investigate pain, pain management methods, affects of pain on daily living activities after undergoing total abdominal hysterectomy, and satisfaction with pain management used by patients, doctors, and nurses. As regards the first dimension, as the patients undergoing total abdominal hysterectomy have pain, the researcher was interested in investigating pain of total abdominal hysterectomy patients during the first three days after the operation including worst pain, least pain, average pain, and pain during assessment, as well as affects of pain on activities of daily living after undergoing total abdominal hysterectomy. With regard to the second dimension, the pain management strategies used by the patients after undergoing total abdominal hysterectomy were examined including pain management strategies used by total abdominal hysterectomy patients, doctors, and nurses, as well as pharmacological and non-pharmacological pain

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management. Finally, as for the third dimension, after pain of patients undergoing total abdominal hysterectomy had been managed, the researcher was interested in exploring the total abdominal hysterectomy patients' levels of satisfaction with pain management strategies used by the patients themselves, doctors, and nurses.

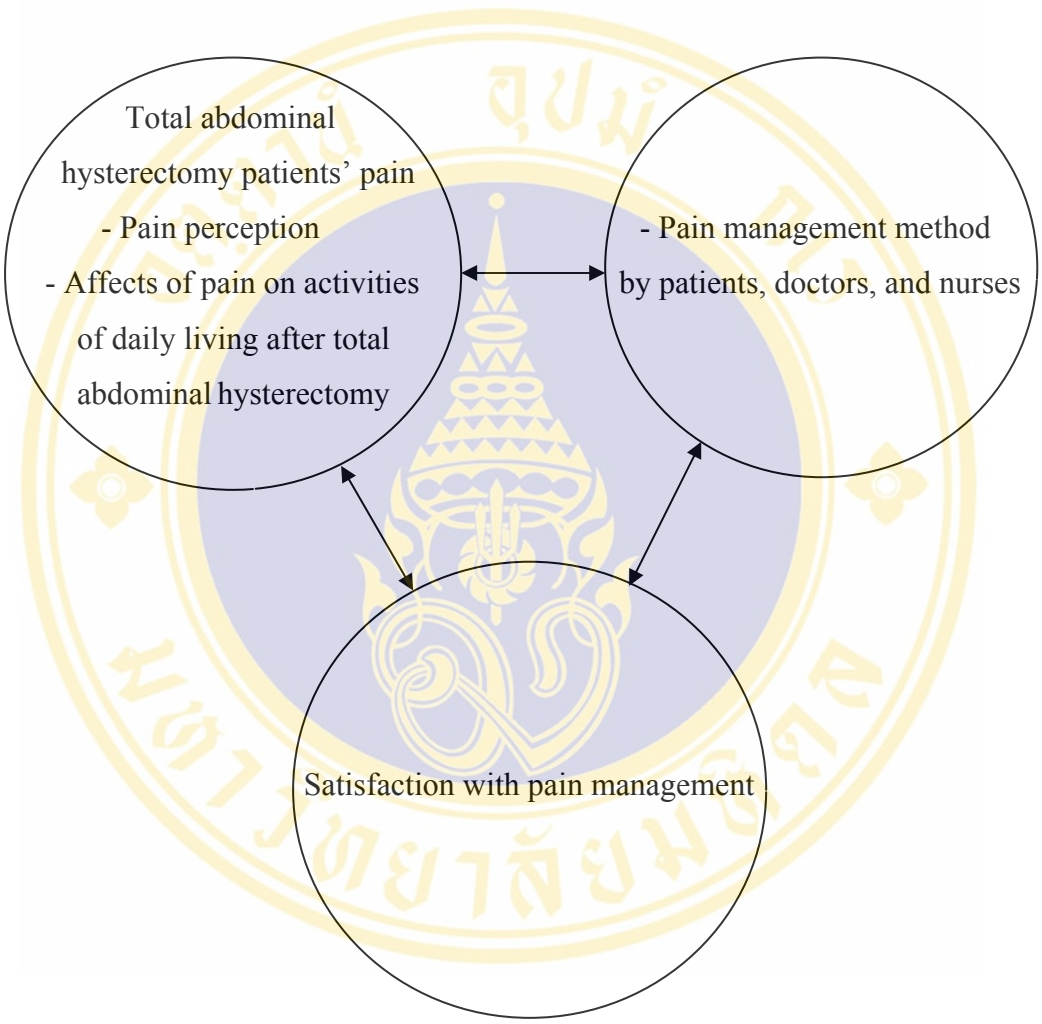

Figure 2: Conceptual Framework of the Present Study

Research Objectives

The objectives of the present study were as follows:

1. To investigate pain of the patients undergoing total abdominal hysterectomy during the first three days after the operation

2. To explore pain management strategies used by total abdominal hysterectomy patients, doctors, and nurses

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3. To study the affects of pain on activities of daily living of patients undergoing total abdominal hysterectomy during the first three days after the operation

4. To examine levels of satisfaction with pain management strategies of patients undergoing total abdominal hysterectomy

Research Questions

1. How severity of pain of the patients undergoing total abdominal hysterectomy during the first three days after the operation?

2. How pain management strategies used by total abdominal hysterectomy patients, doctors, and nurses?

3. How the affects of pain on activities of daily living of patients undergoing total abdominal hysterectomy during the first three days after the operation?

4. How levels of satisfaction with pain management strategies of patients undergoing total abdominal hysterectomy?

Research Hypothesis

There are different pain of the first three days after total abdominal hysterectomy.

Scope of the Study

The present study was descriptive research which aimed at investigating pain; pain management strategies used by patients, doctors, and nurses; affects of pain on activities of daily living; and levels of satisfaction with pain management strategies of patients undergoing total abdominal hysterectomy during the first three days after the operation of 110 patients with total abdominal hysterectomy at Ramathibodi Hospital from October to November 2006.

Assumption of the Study

1. Experience of surgeon at least 5 years after pass board examination.

2. The same surgery technique of surgeon.

3. The medicines that they received at perioperative in the same group follow as; anesthesia, muscle relaxant and pain killer.

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Definition of Terms

Pain of patients undergoing total abdominal hysterectomy patient referred to the feeling of discomfort and emotional experience related to the injury of tissue trauma caused by total abdominal hysterectomy during the first three days after the operation including worst pain, least pain, average pain, and pain during assessment. That assess by Patient Questionnaire.

Pain management strategies referred to the action of patients undergoing total abdominal hysterectomy, doctors, and nurses in order to relieve postoperative pain including pharmacological and non-pharmacological pain management strategies. That assess by Questionnaire that created from literature review.

Pain outcomes referred to the affects of pain or insufficient pain management of patients undergoing total abdominal hysterectomy such as sleep or activities of daily living. That assess by Patient Questionnaire.

Satisfaction with pain management referred to the total abdominal hysterectomy patients' favorable feelings toward pain management they received from doctors and nurses. That assess by Patient Questionnaire.

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CHAPTER II
LITERATURE REVIEW

In this chapter, related literature and research studies regarding total abdominal hysterectomy, pain mechanism, pathophysiology of postoperative pain, factors affecting postoperative pain, affects of pain on activities of daily living, pain assessment, pain management, and satisfaction with pain management are reviewed.

Total Abdominal Hysterectomy

Abdominal hysterectomy is surgery for the uterus whose size is large than 12 weeks of gestation, which has a large tumor, which has adhesion caused by pelvic inflammation, or which is afflicted with endometriosis (Srisomboon, Olanrattanachai and Wanapiruk, 1995). Abdominal hysterectomy may also be required together with ovarian ablation, or when it is suspected that the patients may have cancer (Tingthanathikul & Srisombut, 2005).

Total abdominal hysterectomy is an operation procedure done both vertically at midline and transversely through skin, subcutaneous fat, Scarpa's fascia, rectus sheath, rectus abdominis muscles, pyramidalis muscles, preperitoneal fat, and peritoneum. After opening the abdominal skin, in cases that both the uterus and ovaries need to be removed, the surgeon will make an incision to also remove the round ligament, infundibulo pelvic ligament, uterine vessels, uterosacral ligament, and cardinal ligament (Baggish, 2001). Thus, it can result in injury of the tissues, muscles, tendons, fascias, blood vessels, and neurons (Gilstraps et al., 2003). In addition, as the retractor is also used during the operation, it causes nerve injury which leads to great postoperative pain (Turrenine, 2003).

Besides, total abdominal hysterectomy results in an incision wound about 5-10 centimeters in width (Tingthanathikul & Srisombut, 2005). The duration of the operation ranges from 74.9 to 122.33 minutes. For instances, the duration of 74.9 ±

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25.9 has an average of 115 minutes (Sarmini et al., 2005), while the duration of 77.3 ±18.7 minutes (Atabekoglu et al., 2004) has an average of 122 minutes (Panyim, 2002). As a result, total abdominal hysterectomy is a major operation that can cause great pain for the patients.

Definition of Pain

McCaffery (1968) defines pain as, "Pain is whatever the experiencing person say it is, existing whenever the experiencing person say it does". This classical description of pain makes the client and the expert aware of his or her own pain (McCaffery & Paasero, 1999).

Jean & Melzack (1992) describes pain as, "a highly personal and variable subjective that is influenced by cultural learning, the meaning of situation in which it occurs, attention anxiety, and a host of other cognition and psychological variables".

The International Association for the study of pain (IASP) defines pain as follows: "pain is unpleasant sensory and emotional experience associated with actual and potential tissue damage" (IASP, 1994). This definition describes pain as a multiple component, which impacts both physical and psychological aspect of an individual dealing with pain.

Pain refers to the feeling of discomfort and emotional experience which is related to the fact that the tissues are destroyed or explanation about such destruction of tissue (Turk & Okifuji, 2001).

In summary, pain is referred to as the individual perception of an experience that occurs when tissue are being damaged. A person perceives it as unpleasant physiological, psychological and emotional responses.

Pain Mechanism

Pain mechanism consists of three components—pain stimuli (noxious stimuli), pain receptors (nocicepter), and pain impulse pathways (Curtis & Curtis, 1994 cited by Phattawee, 1998).

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1. Pain stimuli can be divided into three categories as follows:

1.1 Mechanical stimuli such as tissue damage from surgery, edema from inflammation, vessel obstruction, tissue spasm, etc.

1.2 Temperature stimuli such as heat, cold, electricity, etc.

1.3 Chemical stimuli, both internal and external, are endogenous pain-producing substances such as potassium, histamine, serotonin, etc., and exogenous substances such as acids, base, etc.

The pain stimuli will directly activate primary afferent nociceptors. Otherwise, pain may result from the stimuli's destruction of tissues, thus stimulating secretion of some chemicals that activate pain receptors. When activated, the nerve endings will cause depolarization leading to nerve current (Puangwarin, 1991).

2. Pain receptors are activated by dangerous stimuli. They are free nerve endings that can be divided into three major groups of pain receptors (Wallace, 1992 cited in Phattawee, 1998). First, high threshold mechanoreceptors receive sensory similar to a pin prick and heat nociceptor, mostly found in the skin. Secondly, polymodal nociceptors receive various forms of stimuli including pressure, heat, and chemicals. They are found in every type of tissues, both superficial and deep tissues, especially in visceral organs. When the mechanoreceptors are activated, they will activate free nerve endings until the pain threshold is reached to produce pain impulse that is sent to the spinal cord and the brain. The last group consists of specific receptors called low threshold mechanoreceptors which receive sensory of touch and vibration. When activated by vibration or massage, they can inhibit pain stimuli at the spinal cord level.

3. Pain pathways work when free nerve endings are activated and nerve impulses are sent to primary afferent fibers. They can be divided into three groups as follows:

3.1 A-beta fibers or large myelinated fibers conduct impulses most rapidly. They receive nerve impulse from mechanoreceptors with low threshold mechanoreceptors, which are specific receptors such as sensory of touch or vibration.

3.2 A-delta fibers or small myelinated fibers are mechanoreceptors with a high level of pain threshold. They are receptors of sharp pain and pain caused by heat. They function more slowly than A-beta fiber, but they enable individuals to precisely locate the pain, which, in turn, can disappear within a short time.

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3.3 C-fibers or small unmyelinated fibers are pain receptors that receive pain from different sources. They are slower than A-delta fibers, and receive sensory of dull pain, burning pain, and aching pain. It is difficult to specify location of pain, and the pain lasts much longer than other types of pain.

When there are stimuli, all three types of pain pathways will be simultaneously activated. Both A-delta fibers and C-fibers will lead pain impulses, while A-beta fibers will change the impulses to reduce the sensation of pain. This can be explained with the Gate Control Theory and the Endogenous Pain Control Theory.

Gate Control Theory

In 1965, Melzack and Wall presented the Gate Control Theory by explaining that there are transmission and modulation of nerve impulses that take place in different areas, which consist of four major components as follows: spinal gate mechanism, central control, central biasing system, and action system (Ignatavicius et al., 1995; Jackson, 1995).

1. Spinal cord mechanism involves the gate control through nerve currents at the substantia gelatinosa or SG cells in the spinal cord. The nerve currents that are activated by different parts of the body will pass large nerve fibers (A-beta) and small nerve fibers (A-delta and C-fiber) to cells that function to send free nerve ending currents (transmission cell or T cell) to activate brain function to perceive pain. Before reaching T cells, nerve currents must pass through SG cells, which are along the length of the spinal cord and which function as a gate that opens or closes or promotes or inhibits transmission of nerve currents to T cells. The promotion or inhibition depends on the increase of nerve currents in the large and small nerve fibers; that is, if large nerve fibers have more nerve currents, they will activate SG cells, hence an inhibition of nerve currents to activate T cells, or closing the gate. On the other hand, if there are more small nerve currents, they will inhibit the functioning of SG cells, and nerve currents will be sent to T cells, hence the pain currents will reach the brain, or opening the gate (Bonica & Loeser, 2001). Nerve pain currents coordinate with second-order pain transmission (Puangwarin, 1991) before crossing to the ventrolateral part of the spinal cord and ascending along the spinothalamic tract, which can be divided into two tracts (Melzack & Casey, 1968 cited in Bonica & Loeser, 2001) as follows:

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1.1 Neospinothalamic tract receives nerve currents from A-delta fibers and sending them to the thalamus and the somatosensory cortex. They yield information about location and characteristics of stimuli. This system is termed the discriminative pathway by Melzack and Wall.

1.2 Paleospinothalamic tract receives nerve currents from C-fibers and sending them to reticular formation, periaquaductal grey, hypothalamus, and thalamus before sending them to the cortex and limbic system. Nerve currents that reach the reticular formation will activate individuals to become alert and interested in injury, while the nerve currents sent to the hypothalamus and limbic system activate emotional responses to pain. Melzack and Wall call this system the 'motivation affective system.'

2. Central control system receives afferent nerve currents from the dorsal horn which sends data about dangerous stimuli to the thalamus and limbic system. The nerve currents from large fibers send nerve currents through two branches. One sends vibration nerve currents to the gate control at the spinal cord; the other transfer nerve currents to the central control system which will affect the opening or closing of the gate in the control mechanism at the spinal cord. The functioning of this central control system can be divided into three parts as follows:

2.1 Sensory-discriminative system functions by sending nerve signals to thalamus to perceive and differentiate intensity, characteristics, types, and position of pain.

2.2 Motivation affective system functions by sending nerve signals to the reticular formation at the brain stem and then to the periaquaductal grey, hypothalamus to thalamus, to the somatosensory cortex and limbic system to activate the emotions of discomfort and dissatisfaction with pain.

2.3 Cognitive-evaluation system functions to lead input signals of belief and pain experience at the cortical, which adjust the nerve signals before activating the sensory-discriminative system, motivation affective system, and gate control system at the spinal cord (Jeans & Melzack, 1992 cited in Watt-Watson & Donovan, 1992).

All three systems coordinate with one another and send nerve signals to control pain at the spinal cord or cause pain perception including intensity, position, and characteristic of pain in cooperation with emotional arousals before passing it to the

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motor system which expresses pain reactions (Tongtang, 1991). Besides, the motivation affective system and cognitive-evaluation system can directly activate or inhibit the pain control system at the spinal cord.

3. Central biasing system is located at the reticular formation area of the brain stem. It functions to maintain appropriate sensory activators sent to other parts of the brain. Nerve signals inhibit nerve signals sent from the peripheral to maintain appropriate proportion of input nerve signals. If the number of sensory activators increases, the number of inhibitors will increase as well. The function of this system influences the central control system or is influenced by the central control system by sending the nerve signals to control the gate at the spinal cord.

4. Action system is a complex phenomenon of behavioral responses to pain. It is expressed after pain has been perceived including action, movement, problem coping, problem solving, and behavioral expressions to avoid pain. Such responses to pain must combine physiological and psychological conditions and the environment.

As regards pain pathways, in addition to ascending nerve fibers that reach the brain resulting in perception, translation, and emotional arousals, there are descending nerve fibers from the central nervous system at cerebral cortex and periaqueductal gray whose functions involve readiness, emotion, and memory from past experiences sent to control the ascending nerve impulses by transmitting the nerve power to the dorsal horn in the spinal cord to control pain. Such nerve fibers are called “descending control system” that secrete morphine-like substances (Wallace, 1992 cited in Phattawee, 1998).

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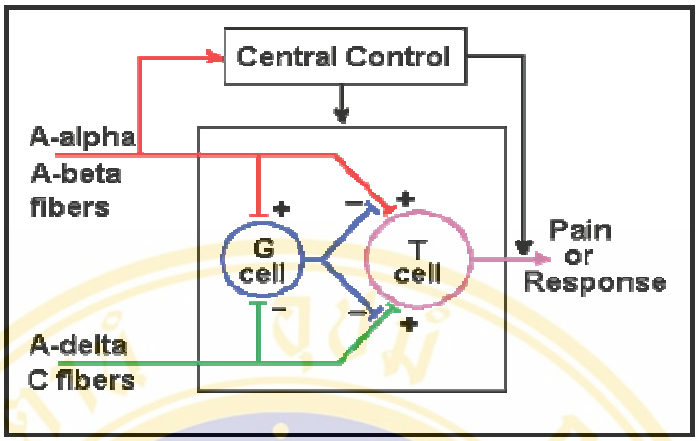

Figure 3: The circuit diagram of the gate-control theory of pain perception as proposed by Melzack and Wall (1965)

Source: www.unmc.edu/Physiology/Mann/pix_6/gate.gif.

In 2003, Wall & Melzack explained the brain function regarding the process of pain perception which is a concept about inputs, body-self neuromatrix, and outputs as follows:

I. Inputs: Inputs include 1) cognitive related brain areas such as memories of past experience, interests, meanings, and anxiety, 2) sensory signaling system including cutaneous, visceral, and musculoskeletal inputs, and 3) emotion-related brain areas such as the limbic system and associated homeostatic/stress mechanisms.

II. Body-self neuromatrix: This includes sensory (S), affective (A), and cognitive (C) aspects.

III. Outputs: Outputs produced by the brain are 1) pain perception including sensory, affective, and cognitive diagnosis, 2) action programs including involuntary and voluntary expressive patterns, and 3) stress regulation programs including levels of cortisol, noradrenaline, and endorphin and functioning of the immune system.

The function mechanisms start from inputs to body-self neuromatrix and end with produced outputs of pain and pain responses.

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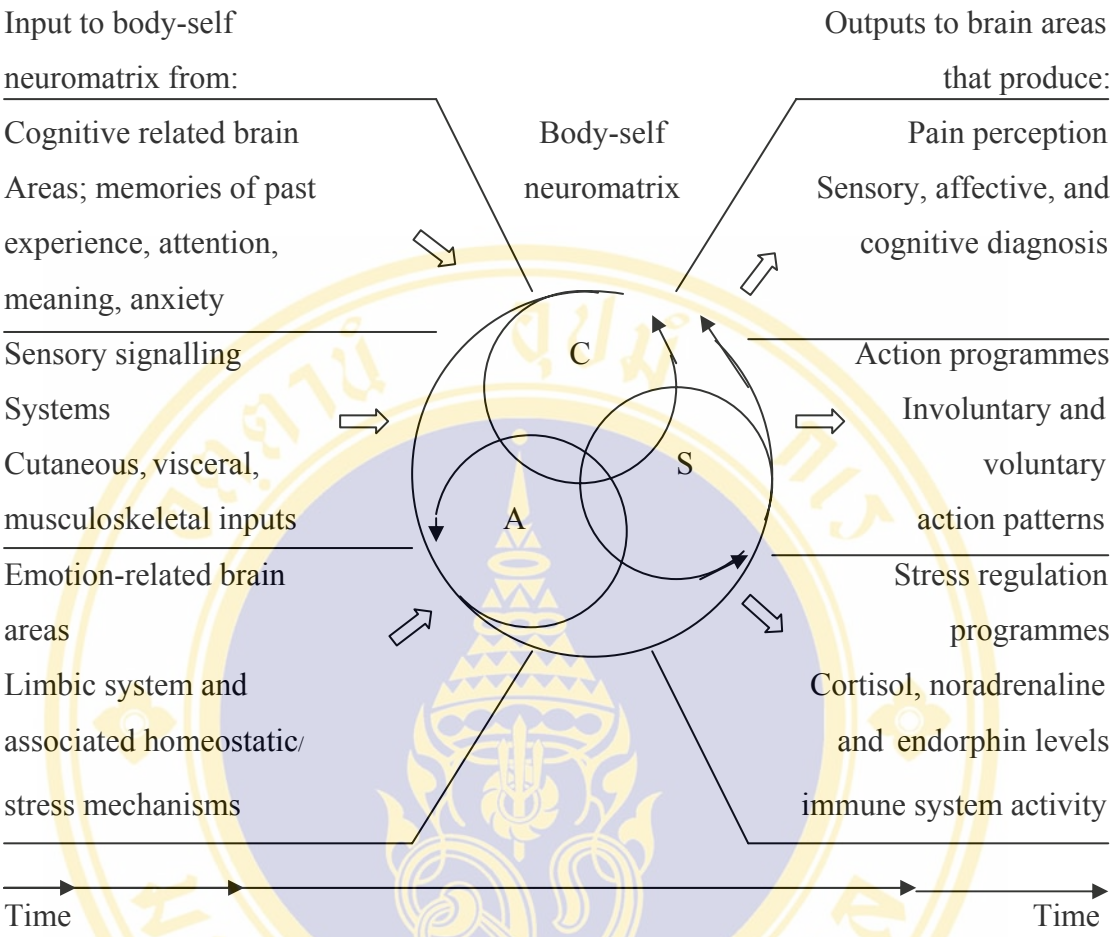

Figure 4: Brain function in the form of body-self neuromatrix
Source: Wall & Melzack, 2003

Factor that contribute to the patterns of activity generated by the body- self neurometrix, which comprises parallel, interacting sensory (S), affective (A), and cognitive (C), neuromodules. The output patterns from the neuromatrix project to other brain areas that produce the multiple dimentions of pain experience as well as concurrent homeostatic and behavioral responses.

Endogenous Pain Control Theory

In 1970, a group of researchers discovered endogenous opiate neuropeptides. Later on in 1973, it was found that four kinds of opiate receptors in the brain and

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spinal cord function related to pain. In 1975, Hugnes et al. found morphine-like substances in the body that can inhibit pain as morphine does (Hugnes et al., 1975 cited in Phattawee, 1998). These substances are divided into three groups as follows:

1. Enkaphalins are substances that consist of five amino acids. There are two types of enkaphalins—methionin-enkaphalins and luecine-enkaphalins which are found in the central nervous system but they are most effective in the dorsal horn area. They inhibit pain by closing the gate at the spinal cord and inhibit nerve currents to the brain (Ignatavicius et al., 1995).

2. Endorphins are found mostly at the pituitary gland. There are three types of endorphins—alpha, gamma, and beta endorphins. Beta endorphins are most effective, and they are found in the hypothalamus, periaqueductal grey, and limbic system. Endorphins control pain in two ways just like enkaphalin.

2.1 It affects the presynaptic nervous system by inhibiting secretion of neurotransmitters of the substance P at nerve endings.

2.2 It affects the postsynaptic nervous system by inhibiting transmission of pain impulses from the secretion of enkephalin by the brain through the descending system.

3. Dynorphin is found mostly in the dorsal horn of the spinal cord. It inhibits pain at the presynaptic nervous system.

It is believed that these morphine-like substances take effect at different levels of the central nervous system by inhibiting neurotransmitters of pain between the interneurons at periaquaductal gray by binding with appropriate opiate receptors (Wallace, 1992 cited in Phattawee, 1998).

The pathways of pain control nervous signals are the control from the cortex and hypothalamus passed down to the periaqueductal grey midbrain and upper medulla and at the dorsal horn area in the spinal cord (Paungwarin, 1991). The gate control mechanisms result from two chemical substances—substance P and endogenous opiate. According to Yessel & Iversen (Yessel & Iversen, 1977 cited in Hinjiranan, 1987 cited in Phattawee, 1998), the gate control will take place when small nerve fibers at the spinal cord are activated, they will secrete substance P. At the same time, large nerve fibers and descending nerve fibers from the brain will secrete chemical substances to activate SG cells to secrete enkaphalins which inhibit substance P from

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sending nerve impulses to activate T cells. Thus, no nerve impulse is sent to the brain, so the individuals do not feel pain. If enkaphalins cannot catch up with all substance P, the remaining substance P will activate T cells to send the nerve currents to the brain, hence a pain perception. It has been found that every time there is a transmission of nerve currents of pain, enkaphalins will simultaneously be secreted from enkaphalins interneurons, which can also inhibit pain currents (Pollayanunt, 1985).

Pathophysiology of Postoperative Pain

Post operative pain is acute pain caused by tissue injury which may activate the secretion of substances. The injured tissues are highly sensitive to pain stimuli, especially during the first 24-48 hours after the operation. Pain is multidimensional, and it depends on the location of the injuries. The pain mechanism starts at the specific location in the brain, including the following:

1. Local reaction

When the tissues are injured, they release chemical substances such as prostaglandin, bradykinin, and histamine from damaged tissues and serotonin from the mast cells and platelets (Chaudakasetrin, 2004). This causes the nerve endings to become more sensitive to pain stimuli and severe pain sensation around the injured areas. In general, pain can be divided into three types as follows:

1.1 In the subcutaneous area: The injured tissues release bradykinin and potassium ion which stimulate nociceptors resulting in pain sensations like pinpricking. This sensation is localized and has a short duration.

1.2 In the deep somatic area: The injured tissues release histamine to activate nerve endings that receive pain sensation. This, coupled with the decrease in nociceptors threshold and the severing of nerve fibers with outgoing transmission from the axons in the fascia, muscles, and other membrane, results in wide and deep distribution of pain sensation in the subcutaneous area. This type of pain is continuous and causes major discomfort, and it lasts longer than the first type of pain.

1.3 In an internal organ: Basically, this typo of pain is similar to the previous two types of pain, and it occurs together with tension and contraction of smooth muscles of the viscera. However, it is more difficult to specify pain location

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because there is no area to receive pain sensation from the viscera in the cerebral cortex and the number of nociceptors in the viscera is small. Thus, this type of pain may be perceived as continuous dull pain.

2. At the spinal cord level, there are reflexes which lead to muscle and vessel constraction, resulting in decreased blood circulation in the area, hence a condition called hypoxia. This, in turn, leads to anabolic metabolism. When this happens, lactic acid and specific acid condition will be secreted, and lactic acid will activate the nerve endings that receive pain signals at the muscle, hence a lower pain threshold and increased muscle pain. The signals will then be sent to the brain, resulting in more pain perception. Therefore, muscle and vessel contraction can be seen as a new source of pain activation, increasing the level of pain intensity and increasing the reflexes at the spinal cord, hence a continuous cycle of pain (Pollayanunt, 1985; Bonica, 1990).

3. Suprasegmental reactions are functioning of the autonomic nervous system which results when the pain signals are sent to the autonomic control center in the hypothalamus. This will stimulate the function of the sympathetic nervous system, making it more rapidly increase epinephrine secretion, hence increased heart rate, blood pressure, and respiratory rate, etc. (Pollayanunt, 1985). Also, the secretion of catabolic hormones such as cortisol, catecholamine, etc. will increase, while the secretion of acatabolic hormones such as insulin will decrease. The changes in hormone secretion affect the metabolism of the body, which lasts several days (Bessman & Renner, 1982 cited in Bonica, 1990). If the pain is severe and lasts a long time, the functioning of the parasympathetic nervous system will be stimulated, resulting in decreased heart rate, blood pressure, etc.

4. Cortical responses: When pain signals reach the brain, pain perception will result, leading to psychophysiology reactions as follows:

4.1 Emotional arousal: The part of the brain that is responsible for emotion and consciousness, as well as the autonomic nervous system, will be activated, leading to undesirable feelings. The patients may try to get rid of such emotions by means of emotional expressions including irritability, agitation, anxiety, and fear, etc. (Smith & Covino, 1985 cited in Phattawee, 1998).

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4.2 Verbal behavioral expressions such as crying, groaning, and making trembling noises.

4.3 Movement behavioral expressions such as stopping any body movement.

Factors Influencing Postoperative Pain

Postoperative pain results from a number of factors that influence pain perception as follows:

1. Physiological factors

1.1 Tissues and nerve damages from injury are the cause of pain. The level of pain intensity depends only on the level of tissue damage (Blumberg et al., 1990 cited in Price & Bushnell, 2004). Research has indicated that postoperative pain will increase if the operation takes longer, or if the surgeons are not sufficiently skillful (Banister, 1974 cited in Panyim, 2000). Transverse line incision of the abdomen results in less postoperative pain than vertical line or oblique line (Bonica & Benedetti, 1980 cited in Panyim, 2000).

1.2 The site and type of surgery have an effect on pain as all bodily organs have different sensory nerve fibers and have different levels of pain sensitivity. Also, different types of surgeries destroy different tissues and nerve cells. As a consequence, sites and types of surgery are a good indicator of postoperative pain (Chapman, 1985 cited in Phattawee, 1998).

1.3 The knowledge, skills, and technique of anesthesia administration have an effect on patients' postoperative comfort and level of pain. With regard to the dosage of muscle relaxants, if the amount is too little, the degree of injuries of the muscle due to difficulty of the operative process will increase, hence a higher level of postoperative pain (Bonica, 1990).

2. Psychological factors

2.1 Psychological factors that influence pain perception and pain experiences such as fear and anxiety are major emotional factors that cause acute pain, especially fear of death. If patients are unable to deal with such severe and acute pain, they may suffer from depression and hopelessness, hence a loss of self control (Wall & Melzack, 2003).

2.2 Past experience with pain and perception of information regarding effects of pain stimulation are the causes of a higher or lower pain perception

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(Brunner & Suddath, 1988 cited in Panyim, 2000). The patients may assess that effects of pain are a situation they can confront by means of adaptation, hence a faster rate of recovery after surgery.

2.3 The patients who receive information before surgery such as explanation of relaxation techniques feel better and can better cope with postoperative pain. In addition, they have a faster recovery than those who receive only the information about the expectation of postoperative pain experience (Ignatavicious et al., 1995).

3. Sociocultural factors

3.1 Sex: Previous studies have reported that females can show more intensity of pain, more frequency of pain, more multiple locations of pain in the body, and longer duration of pain than males (Unruh 1996, Berkley 1997a cited in Holdcroft & Berkley, 2003). Females have a lower pain threshold, more activated frequencies, and lower pain tolerance when compared to males (Riley et al., 1998 cited in Holdcroft & Berkley, 2003).

3.2 Age: Individuals at different ages have different reactions to pain, and younger individuals are better able to adjust to pain when compared to those who are older (Tongtang, 1991). However, a study has reported that there was no statistically significant difference when it comes to perception of pain intensity of teenagers, adults, and elderly persons (Riley et al., 2000 cited in Riley III & Wade, 2004). The elderly have fewer reactions to postoperative pain than adults (Bonica & Benedetti, 1980 cited in Panyim, 2000). Therefore, no definite conclusion about the age factor can be made due to contradictory research findings.

3.3 Culture: Previous studies have found that black and white persons do have different perception of pain intensity (Riley et al., 2002b cited in Price & Bushnell, 2004). Empirical evidence has pointed out that in the western world, females tend to have a lower pain threshold than males. On the other hand, in the eastern world where females have a lower level of social status and social recognition, females tend to have a higher pain threshold than males (Jaothakasetrin, 2004). As regards education, research has discovered that there was no significant relationship between educational background and pain tolerance (Jacox, 1977 cited in Panyim, 2000)

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4. Environmental factors

Environmental factors influence the onset of pain stimulation in two ways. First, appropriate environments such as cleanliness, silence, and suitable temperature increase pain threshold to withstand pain stimuli and help decrease pain. On the contrary, intensity or inappropriate environment such as dirtiness, aggression, and excessive heat or cold decrease pain threshold and increase pain (Poomnikom, 2000). The changes in daytime and nighttime also affect perception of pain stimuli. In general, patients tend to have more pain perception during the night because there are no activities to do and patients live in calmness and loneliness, so they are more likely to continuously perceive pain. Besides, emotional environments such as safety, family relationships, and communication with healthcare team members have an influence on pain perception. Thus, it can be concluded that both physical and mental environments have an effect on perception of pain.

Affects of Pain on Activities of Daily Living

The body's reactions to pain lead to physio-psychological sufferings, especially among patients who do not receive pain management or patients whose pain management is not sufficient (Tyler & Krane, 1989 cited in Phattawee, 1998). Sufferings from pain arouse the patients' emotion, leading to irritability, agitation, mental discomfort, uneasiness, and lack of desire to socialize with others. As a result, their interpersonal relationships with other persons can be affected. Furthermore, reactions to pain increase the work of all organs, while some parts of the body tissues lack oxygen, so the stored energy will be expended. This can bring about exhaustion and suffering, and it can prevent the patients from doing activities of daily living and make them suffer from disturbed sleep (Thompson, 1986; Mc Intosh, 1989 cited in Phattawee, 1998).

Good, et al. (2000) carried out a study on postoperative gynecological pain during the first two days after surgery. They found that the sample had worst pain as follows: on the first postoperative day, they had severe pain and on the second postoperative day, they had moderate-severe pain. As for least pain, the sample had mild pain on both the first and the second postoperative days. As regards affects of pain, 30% of the patients reported that the pain disturbed their sleep in the first two

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postoperative nights, and 65% reported that they had difficulty sleeping during the first postoperative night. In addition, it was found that pain increased when the patients moved after the operation, but pain decreased when the patients took a rest. Also, about nine percent of the patients used relaxation techniques to release pain. Thus, it could be concluded that moderate to severe pain cannot be relieved with medicines alone.

Based on the study of Good et al., it can be summarized that hysterectomy patients have severe pain in the first postoperative day which affects their sleep. Such finding is in congruence with the studies of Potaros (1995) and Phattawee (1998) which found that pain disturbs sleep in postoperative patients and postoperative patients with cardiovascular thoracic surgery by median sternotomy, respectively. Besides, pain has an effect on emotion, movement, and relations with other person (Phattawee, 1998).

Postoperative Pain Assessment

1. Assessment from the accounts of the patients including asking them about intensity, location, timing, and previous pain. The patients' accounts are an important factor in pain assessment based on the assumption that only the patients know the accurate quantity and amount of pain (Feldman, 1991; Johnson, 1997; Stewart, 1977 cited in Phattawee, 1998).

1.1 The intensity of pain can be divided into three levels as follows:

1.1.1 Mild pain is found in about 30% of all patients. The intensity of pain is rather low, and it lasts one to two days. This level of pain can be decreased by using non-narcotic oral medications.

1.1.2 Moderate pain, like mild pain, can be found in approximately 30% of the patients. This type of pain has severe intensity and lasts a long time. To decrease this type of pain, weak opioids must be used.

1.1.3 Severe pain is found in about 40% of the patients. The level of pain intensity may be so high that only oral pain medication may not work, and other pain management methods such as regional anesthesia may be required (Srirojchanakul, 1991).

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There are two types of pain assessment: single-dimension scales and multiple-dimension scales.

1) Single-dimension assessments include a straight line, faces, colors, etc.

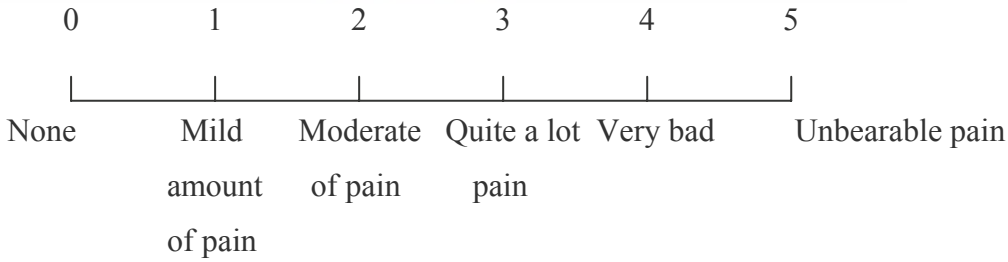
Straight line is the assessments of intensity of pain in a straight line that have been used by various researchers in Thailand include the Visual Analogue Scale, Simple Descriptive Scale, Graphic Rating Scale, and Numeric Rating Scale.

Visual analog scale: VAS is a straight line 10 centimeters in length. There are words underneath the line at both ends to indicate 'no pain' at one end and 'pain as bad as it could possibly be' at the other.

No pain Pain as bad as it could possibly be

Based on the literature review, in Thailand, several researchers have used the VAS to assess postoperative pain (Chanchayanon, et al., 2000; Tuntisirin, et al., 2000; Adulpokathorn, 2000; Choorat, 2001).

Simple Descriptive Scale: SDS is a straight line with controlling numbers and words to indicate the level of pain, ranging from 0 to 5, and from 'none,' to 'mild,' 'moderate amount of pain,' 'quite a lot of pain,' 'very bad pain,' and 'unbearable pain.'



The literature review has shown that in Thailand Siriluck and Techaritpitak (1995) used the SDS to assess pain in postoperative open heart patients.

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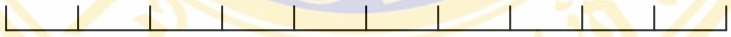
Graphic Rating Scale: GRS is a straight line with words that are used as indicators of the levels of pain the patients are experiencing, from 'no pain,' to 'mild,' 'moderate,' 'severe,' and 'pain as bad as it could possibly be.'

No pain Mild Moderate Severe Pain as bad as it could possibly be

Based on the review of literature, in Thailand, Chawmathagit (1979) used the GRS to assess pain in post abdominal operative patients.

Numerical rating scale: NRS is a straight line with the numbers on the top ranging from 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, to 100, and with the verbal interpretation on the bottom. Number 0 means 'no pain,' 50 means 'moderate pain,' and 100 means 'unbearable pain.'

0 10 20 30 40 50 60 70 80 90 100



No pain Moderate pain Unbearable pain

From the literature review, in Thailand, Dulyatham (2001) used the numerical rating scale to assess pain in postoperative patients.

Colors; Stewart pain-color scale is a strip of continuous colors, ranging from white, to yellow, to orange, to red, to violet, and to black. There are words at both ends of the strip to indicate no pain and the highest level of pain possible.

No Pain as bad as it could possibly be

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The literature review has shown that Boonrite (1997) used the pain-color scale to assess pain in caesarean section patients.

Face; Wong-Baker faces pain rating scale is a series of drawings of faces, starting from a smiling fact and ending with a crying face. The accompanying numbers range from 0 to 10, indicating no pain at all to the highest level of pain.

0 2 4 6 8 10

No pain Most pain

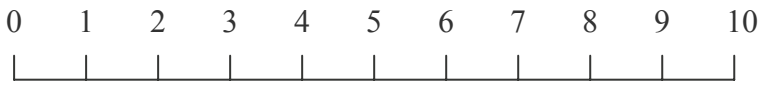
According to the literature review, Poonkesorn (1999) used the faces pain rating scale to assess pain in post abdominal operative patients.

2) Multiple dimensions

The multiple dimensions assess intensity of pain, characteristics of pain, position of pain, pain management, and effects of pain. Examples are Johnson's two-component scale, The McGill Pain Questionnaire, Brief Pain Inventory, and Patient Questionnaire, etc.

Johnson's two-component scale is used to assess pain in two parts; that is, intensity of pain and pain-induced distress and suffering. The intensity of pain is assessed with a straight line 10 centimeters in length, with the numbers 0-10 on the top and the verbal interpretation on the bottom. Number 0 means 'no pain,' number 5 means 'moderate pain,' and number 10 means 'worst possible pain.' The other straight line is also 10 centimeters long, with the numbers 0-10 on the top and their verbal interpretation on the bottom. Number 0 means 'no distress,' number 5 means 'moderate distress,' and number 10 means 'worst possible distress,' as illustrated below.

Part I: Pain Sensation Scale



0 1 2 3 4 5 6 7 8 9 10

No pain Moderate pain Worst possible pain

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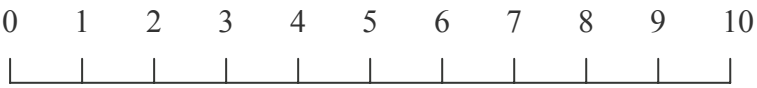
Part 2: Distress Scale



No distress Moderate distress Worst possible distress

According to the literature review, Johnson's two-component scale has been used to assess pain in postoperative patients (Chareonchai, 1998), patients undergoing a caesarean section (Theansee, 2001), and abdominal hysterectomy patients (Panyim, 2000).

The McGill Pain Questionnaire (MPQ) is a questionnaire used to assess location of pain, characteristics of pain, pain relief, and level of intensity of pain. The items included are both closed-ended and open-ended questions (Chapman & Syrjala, 2001).

Brief Pain Inventory (BPI) is a tool to assess pain developed by Pain Research Group, Department of Neurology, University of Wisconsin-Madison Medical School. It is used to assess levels of pain and the quality of life of the patients. The questions in the inventory have been designed to assess the location of pain, its level of severity, its aggravation, pain relief, the characteristics of pain, the effect from pain, etc. The questions are multiple-choice type to choose the responses from a scale ranging from 0 to 10. Some questions are open-end questions (Chapman & Syrjala, 2001). As for the application of BPI, its validity and reliability have been examined among the samples with different languages and cultures, and the results confirmed that BPI could be used to assess pain in such situations.

Based on the review of literature, studies have been carried out to investigate the use of BPI to assess pain levels in cancer patients (Poonsaard, 2000), postoperative abdominal patients (Kanogsunthornrat, 1992), and knee osteoarthritis patients (Suwanraj, 2001).

Patient Questionnaire is a tool to assess pain. It was developed from the Patient Outcome Questionnaire by American Pain Society Quality of Care Committee, and it

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is composed of two parts. The first part is for pain assessment, affects of pain on activities of daily living, levels of pain relief, the level of satisfaction with pain relief which received from the doctor and nurse, waiting period for painkillers or new treatments, an obstacle for pain management, and the definition of pain management while the patients are staying at home or in the hospital. The second part elicits basic information of the patients including gender, age, race, marital status, condition, diagnosis, operation, and painkillers used (American Pain Society Quality of Care Committee, 1995).

Based on the literature review, it was found that Patient Questionnaire was used to assess pain in cancer patients (Luengsukchareon, 1997; Sailamai, 1998), postoperative patients undergoing cardiovascular thoracic surgery by median sternotomy (Phattawee, 1998), and caesarean section patients (Waiyanetta, 1999).

1.1 Pain location and boundaries as described by the patients themselves through dictation or drawing of a picture. Based on the literature review, it was found that previous studies have been conducted to investigate location and position of pain such as abdominal cavity operative wound pain (Leelathanarerk, 1999; Poonkesorn, 1999; Chennil, 2000; Chaiyakhun, 2001; Pongchareon, 2001).

1.2 Pain characteristics as described by the patients such as dull pain, throbbing pain, sharp pain, exhausting pain, burning and stinging pain, writhing pain, as well as other feelings that accompany pain such as nausea, vomiting, etc.

1.3 The starting time and duration of pain.

1.4 History of pain in the past and the methods of pain relief that the patients have used or received in the past.

2. Behavioral observation of patients

2.1 Motor behaviors including facial expressions such as frowning, gnashing teeth, tightly closing eyes, etc., as well as body movements such as writhing, tightening fists, lying still, and having no movement at all, etc.

2.2 Vocal behaviors such as groaning and moaning, crying, sobbing, hissing, or screaming, etc.

2.3 Affective behaviors such as irritability, anger, nervousness, or depression, etc. (Johnson, 1997; Luckmann & Sorensen, 1987 cited in Phattawee, 1998).

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3. Assessment with measurement and observation of physiological changes

Mild to moderate pain or pain on the body surface leads to reactions of the sympathetic nervous system including paleness, dilated pupils, increased secretion of sweat, increased blood pressure and heart rate, spasm of stripes muscle, etc.

Severe pain or deep muscle pain leads to reactions of the parasympathetic nervous system including nausea, vomiting, exhaustion, syncope or decreased consciousness, decreased blood pressure and heart rate, etc. (Johnson, 1997; Luckmann & Sorensen, 1987 cited in Phattawee, 1998).

4. Assessment from the amount of medicines for pain relief (Oden, 1989 cited in Phattawee, 1998).

The amount of medicine for pain relief that the patients receive is an indicator for the severity of pain and duration of pain, as reported in the studies of Panyim (2000) with abdominal hysterectomy patients, Adulpokatorn (2000) with patients with abdominal surgery, and Theansee (2001) with patients undergoing a caesarean section, etc.

5. Affects of pain on activities of daily living such as sleeping, eating, and performing other activities, etc. (Phattawee, 1998).

Pain Management in Hysterectomy Patients

There are a number of pain management methods to relieve pain in hysterectomy patients including pharmacological pain management and nonpharmacological pain management.

1. Pharmacological pain management refers to the use of different groups of medicines for pain relief.

1.1 Non-steroidal anti-inflammatory drugs (NSAIDs) yield better treatment outcomes than painkillers. Generally, they can relieve mild to moderate pain, but sometimes they can be used to relieve severe pain. Examples are aspirin, ibuprofen, and naproxen sodium, etc. NSAIDs will activate the nerve endings at the injured area, but sometimes they also relieve pain at the central nervous system by means of

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prostaglandin and other chemicals in the body. They can relieve pain within 30 minutes after taking the medicines, and their effects last four to six hours.

NSAIDs are medicines used to treat inflammations such as rheumatoid as well as other symptoms such as postoperative pain. This group of medicines causes side effects such as stomachache, gastric ulcer, or gastrointestinal bleeding resulting from disturbance of platelet aggregation. However, one-time application or short-term administration such as after an operation causes minor side effects. To reduce the risk of gastric ulcer, the medicines should be taken with meals. Another alternative is to administer histamine 2 blockers such as cimetidine or ranitidine together with sucralfate.

At present, there are drugs in the NSAIDs groups that are manufactured for pain relief and inflammation with fast effect, and with little effect on the gastrointestinal tract. They are medicines used to relieve acute pain and postoperative pain including parecoxib, which is an injection and a pro-drug of valdecoxib. However, currently there are no data on its complications with the gastrointestinal tract, the blood vessel system, and the heart. Furthermore, no large long-term clinical trials have been conducted on its effects, and there are only two short-term randomized placebo controlled trials to explore complications of the medicine when used in postoperative patients. In one study, the study findings revealed that, in postoperative patients with coronary-artery bypass grafting [CABG], the patients who received parecoxib and valdecoxib had a higher rate of complications of the blood vessel system and heart (myocardial infarction, cardiac arrest, stroke, and pulmonary embolism) than those who received placebo with statistical significance ($p = .03$). As for the other study, the use of intravenous parecoxib with oral vadecoxib in other groups of postoperative patients without blood vessel operation (non-vascular general surgical procedure) was examined. It was found that there was no statistically significant difference when it came to the rate of complications of the blood vessel system and heart between those who received the drugs and those who received only the placebo (Angthararuk, 2005).

1.2 Simple analgesics are the first medicines to be administered to relieve mild to moderate pain. The drugs in this group are Acetaminophen or paracetamol. They work by affecting the central nervous system, and they are slightly like the antiinflammation medicines in that they affect the pain area. Simple analgesics have

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slight effects on the gastrointestinal tract, and they can be used with the patients who are allergic to aspirin or other NSAIDs. However, this group of medicines may be poisonous for the liver, so they should be used with care in the patients who are heavy drinkers or have a liver disease.

1.3 Opioids are used to relieve moderate to severe pain. They can be used when NSAIDs and acetaminophen drugs have proved ineffective. Opioids take effects at the central nervous system by binding with opiate receptors in the brain and spinal cord to relieve pain. The opioids that are popularly used to relieve acute pain are both belonging to the weak opioids group such as codeine and tramadol and those in the strong opioids group such as morphine and pethidine (Thithapanda, 2005).

Morphine is the most popular medicine that helps control the pain in the first 24 hours after the operation. It works by binding with opiate receptors in the brain and spinal cord. The increase in the level of morphine means the increase in its pain relief effects. Although morphine can effectively relieve pain, a high dose of morphine can be harmful, just like other drugs in the opioid group. It decreases the function of the nervous system, decreases respiratory rate, and induce nausea, vomiting, urine retention, constipation, and sedation (Ignatavicious et al.,1995).

Lo, Chia, Liu & Ko, (2005) studied the effects of the use of morphine in combination with droperidol in abdominal hysterectomy patients. The results of the study showed that in the first 72 hours after the operation, the experimental group used less morphine than the control group. Also, morphine helped to decrease pain intensity in the first 48 and 72 hours after the operation. Finally, it was found that the control group had more nausea and vomiting than the experimental group in the first day after the operation.

Medicines to relieve pain should be given as soon as the patients begin to feel pain to prevent severe pain (McCaffery, 1987 cited in Phattawee, 1998). As an effect of the operation, substances that cause pain will be released, as well as substances that stimulate many tissues and nerve cells to produce pain which will continue for a long time (Bonica, 1990). If the usual and safe doses of medicines are given when the patients already have severe pain, they may not be as effective as they should to relieve pain. Thus, in postoperative patients who have severe pain, or who are

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supposed to have severe pain, pain relief medication should be administered punctually (McCaffery, 1987 cited in Phattawee, 1998).

2. Nonphamacological pain management is composed of mechanical methods and pain management through thinking and action.

2.1 Mechanical methods involve stimulation through the skin including application of a hot compress, cold compress, massage, touch, therapeutic touch, and nerve stimulation with electricity through the skin.

2.1.1 Hot compress and cold compress are used to stimulate large nerve fibers with heat or cold. The most commonly used compress for pain relief is dry heat and dry cold. Heat can relieve pain by making all tissues, including collagen, connective tissues, tendons, and membrane-covered joints dilate, thus improving their flexibility (Lehman & De Lateur, 1982 cited in Phattawee, 1998). Furthermore, Pansrimangkorn, Toskulkao & Sirikul (1993) conducted a study on warm sitz bath alternate with cold sitz bath after anus operation. They found no statistically significant difference among inflammation, congested blood, and operative wound pain after sitz bath in both groups ($p > .05$). As regards the sample's opinion of sitz bath, the group that had sitz bath with the cold water alternate with warm water had satisfaction with the results of sitz bath; that is, the wound was clean, swollenness and pain decreased, and they had more relaxation and comfort than those who had only warm sitz bath.

Sukmuang (2001) examined the effects of pain reduction and side effects of cold compression and capsaicin application of pain reduction in patients with soft tissue injuries. The results of the study showed that cold compression and the capsaicin applications could reduce pain in both interventions, but the second application of cold compression and capsaicin was able to reduce pain better than the first application of cold compression and capsaicin. The most commonly found side effect of cold compression was redness, whereas the most commonly found side effects of capsaicin applications were coldness, burning sensation, and reddened skin.

2.1.2 Massage is stimulation of nerve large fibers, resulting in inhibition of pain signals at the pain control center located at the spinal cord. Pongchareon (2001) studied the effects of massage on pain levels in post abdominal

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operative patients during the first three days after the operation. The results showed that the pain sensation level, behavioral response to pain, blood pressure, heart rate, and respiratory rate of patients decreased after the massage. The duration during which the patients started to report increased surgical wound pain after massage was 2.52 hours, and every patient reported that they liked the massage which they received (Pongchareon, 2001).

2.1.3 Touch is a direct stimulation of large nerve fibers that increases the S.G. function to inhibit T cells function, thus closing the door and inhibiting the transmission of nerve signals to the brain. Besides, it leads to muscle relaxation, improves blood circulation at the surgical wound, decreases retention of the waste from metabolism, and deviate patients' attention from pain. The methods of touch include touching hands or arms or softly patting the patients' hands and arms. This is an easy method which takes a little time for preparation and does not require any tool (Dochring, 1989 cited in Phattawee, 1998). In addition, touch is a mean to establish relationship and lines of communication between the patients and nurses, and it decreases tension and fear and makes the patients happy (Hudak & Benz, 1990 cited in Phattawee, 1998).

2.1.4 Therapeutic touch or healing touch is applied based on the rule of therapeutic touch that individuals have a power field which is an open system. When individuals are sick, they lose the balance of their power field. Nurses are healthy individuals with a balanced power field. Therapeutic touch is done when nurses use their hands to send the power to the recipients, or the patients, to examine and restore the balance of their power field (Kumaran, 2006). Meehan (1993) investigated the effects of therapeutic touch on postoperative pain and found that during the first hour after the application of therapeutic touch, the patients' pain remained unchanged, but the duration before they asked for the next administration of painkillers was longer that that of the patients who had imitation therapeutic touch. Meehan explains that the tension of postoperative pain is more intense than that of stress-induced headache. However, to use therapeutic touch to the greatest possible effects, the individuals who send power must have the skill or previous training (Chinnoros, 1997).

2.1.5 Transcutaneous electrical nerve stimulation (TENS) refers to a tool that is used to stimulate peripheral nerve endings with electricity through the skin

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using the transcutaneous electrical nerve stimulator (TENS), a battery-powered electrical stimulator that uses frequency and intensity that are harmless and that can be adjusted according to satisfaction and preference of the patients. The TENS releases electric waves into the body through a pole of electrode attached to the skin. In so doing, electric waves stimulate large nerve fibers through the skin to inhibit or relieve pain, as explained by the Gate Control Theory of Melzack and Wall and/or stimulate the release of endorphin (Sharma, 2005; Irving, 2005).

Carroll et al. (1996) conducted a systematic review of using TENS to relieve acute postoperative pain. In this study, the experimental subjects received TENS to relieve postoperative pain, while the control subjects received usual pain management such as intramuscular opioid injection or a placebo. A total of 17 studies were reviewed to determine the effectiveness of pain relieving methods and pain scores. The findings were as follows. First, in 14 studies, the use of TENS and placebo yielded similar results. Only one study showed that the use of TENS could reduce the level of pain with no statistical significance. Second, the use of opioids with TENS and the use of opioids alone were compared in seven studies. Of these seven studies, four involved the use of TENS placebo. The findings revealed that five out of seven studies reported no differences. However, as for the remaining two studies, one showed that the use of pethidine injection decreased and the subjects had a high score of treatment outcomes; the other revealed that the subjects had a lower level of pain after using TENS for three times a day, each lasting 20 minutes.

Besides, Chen et al. (1998) investigated the effects of using TENS to decreases dependence on opioid analgesics to relieve postoperative pain of patients undergoing total abdominal hysterectomy or myomectomy procedures. They found that in the first 24 hours after the operation, dependence on opioid, the duration of PCA usage, and the incidences of nausea and dizziness of the patients with dermatomal-TENS around the surgical incision decreased more when compared with those of the control (sham) group and nonacupoint-TENS at the shoulders group.

In Thailand, Pimpong, Tangtrongchitt, Deesomsak and Sornsong (1998) conducted a study to determine the effectiveness of TENS to decrease postoperative pain in patients undergoing abdominal surgery. The results of the study revealed that

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using TENS to decrease abdominal operative pain during the first 48 hours could decrease pain levels with statistical significance ($p < .001$).

2.2 Pain management though thinking and action

This method enables individuals to encounter pain by adjusting their perception of pain and controlling their pain by changing their thoughts, emotions, and behaviors toward pain (Keolai, 2002). Pain management though thinking and action can be done in a number of ways such as giving instruction or information, diversion of interest, and relaxation.

2.2.1 Teaching or giving information

Teaching that helps decrease pain of patients includes teaching and assisting patients to do different activities such as correctly and carefully changing positions, using both hands to support the incision wound when moving, or using a pillow to apply pressure on the incision wound when moving or coughing. In cases there is a drain from the surgical wound, patients can be taught to hold onto a tube to prevent it from pulling at the wound while moving, or to use a safety pin to hold the tube to the bed to prevent it from moving and pulling the incision wound. Patients can also be taught to support the wound and make sure that it is in the correct position (Copp, 1984 cited in Phattawee, 1998). Besides, fundamental nursing to ensure comfort, cleanliness, appropriate position, quiet environment, appropriate temperature, and good ventilation can increase patients' physical comfort and happiness, thus enabling them to make better use of adaptation mechanisms and reducing emotional arousals that cause pain (Pollayanunt, 1985). Studies have been conducted to determine the effects of provision of information on pain levels. For instance, Magpume (1987) found that the patient who received complete information did not experience severe postoperative pain, required fewer painkillers, and had fewer postoperative complications. Similarly, Nipatkusonkit (1994) reported that provision of information as required by the patients could reduce pain and the number of administrations of painkillers within 72 hours after abdominal surgery. In addition, Chareonchai (1998) studied the effects of preparation for readiness by giving information and advice on anxiety, pain, and suffering of patients undergoing the operation to change their heart valve. The results of the study suggested that the patients who received preparation of information readiness had less anxiety, pain, suffering, behavioral responses to pain

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by means of countenance, tone of voice, and movement, and social interaction than the patients who did not receive such information preparation. It was also found that the patients who received preparation for information readiness used painkillers less than the patients who did not receive such preparation within the first 48-72 hours after the surgery.

2.2.2 Diversion of interest

There are a number of methods that can be use to divert patients' attention from the pain they are experiencing. These include watching television, reading books, participating in group activities, talking with others, and listening to music (Pollayanunt, 1985). A large number of researches have investigated the effects of diversion of interest on reduction in postoperative pain among different group of patients. For example, Kittisup (1994) studied the effects of music to relieve pain and anxiety of patients undergoing open heart surgery in the ICU within 48 hours after the operation. The results of the study indicated that pain level and anxiety level of the patients who listened to classic music, both Thai and western, which was played continuously during the first 24-48 hours after the surgery had significantly lower levels of pain than the patients who did not listen to music.

Boonrite (1997) investigated the effects of music on postoperative anxiety and pain in women undergoing a caesarean section within 24-48 hours after the surgery. The results of this study indicated that the patients who were given music therapy had lower levels of anxiety and postoperative pain than the patients who were not given music therapy. Likewise, Adulpokathorn (2000) examined the effects of preferred music on postoperative pain in patients with abdominal surgery in the first of 48 hours after surgery and found that the level of pain intensity in the patients who listened to preferred music was significantly decreased more than that in the patients who did not listen to music. However, there was no difference in the use of painkillers between both groups.

Taylor et al. (1998) explored the effects of music on pain levels of women who had abdominal hysterectomies in the post anesthesia care unit. The research findings showed no differences in levels of pain between groups. Furthermore, Good and Chin (1998) investigated the effects of Western music on postoperative pain in Taiwanese patients and discovered that music could reduce pain and suffering. Also, Taiwanese

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patients preferred harp music, and some would prefer Buddhist chanting or songs popular in Taiwan. Such findings support the use of culturally acceptable music in addition to analgesic medication for relief of the sensation and distress of postoperative pain.

Besides, Theansee (2001) studied compared the effects of Thai classical music and Thai massage on patients undergoing a caesarean section. The research results revealed that the patients who received Thai classical music therapy and the Thai massage therapy had less pain than before the treatment and less pain than the patients who did not received such applications. However, there was no difference between the pain of the patients who received Thai classical music therapy and those who received Thai massage therapy.

As regards reading as interesting diversion from pain, Leelathanarerk (2000) examined the use of comic books to help deviate postoperative pain and found humorous media could decrease pain and stress of postoperative patients with gastrointestinal problems including those undergoing appendectomy, cholecystectomy, and hemorrhoidectomy during the first and second days after the operation.

2.2.3 Meditation

Poonkesorn (1999) conducted a study and found that meditation training could decrease pain in the patients who received abdominal surgery at 4, 12, 24, and 36 hours after the operation.

Tiyamook, Pokpuengkit, Narksanong & Cheubang (1997) reported that patients undergoing abdominal surgery who practiced meditation needed less painkillers, had better vital signs, had lower levels of postoperative pain, and had less pain behaviors than those who did not receive meditation training.

2.2.4 Relaxation

Relaxation techniques that are commonly used in nursing intervention include breathing exercises, muscle exercises, and breathing exercises with muscle exercises. In order to be effective, relaxation training has to be used with patients who are both physically and psychologically ready. Previous studies have pointed out that when relaxation techniques are used, they are able to relieve pain and reduce patients' suffering from postoperative pain, hence less dependence on painkillers. For

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example, Jamornman (1989) investigated the effects of relaxation training on pain relief in patients with abdominal surgery during the first to third postoperative days. The research result showed that the experimental group that received relaxation training by deep breathing exercises, muscle relaxation, and positive imagination by listening to audiotape in addition to usual nursing care had less pain and suffering from the operative wounds during the first three days after the surgery. In addition, the study subjects required fewer injections of painkillers during the first 24 hours after surgery. The interval between the first analgesic medicine injection after surgery and the next administration was longer, and levels of pain at 24, 48, and 72 hours and levels of suffering at 48 and 72 hours after surgery were also lower. These findings led to a conclusion that relaxation training can decrease operative wound pain and enables patients to be less dependent on painkillers.

Srivivat (1995) studied the effects of a relaxation program on patients undergoing cholecystectomy and found that the patients experienced a lower level of pain and ileus and had a better recovery rate after surgery than those who did not participate in a relaxation program.

Wongpiriyayothar (1993) reported that relaxation training could reduce anxiety and perception of pain intensity, systolic blood pressure, diastolic blood pressure, patients' behavioral responses to pain by vocalization and movement, and social interaction of patients with open heart surgery.

Choorat (2001) carried out a study and found that progressive muscle relaxation technique could relieve postoperative pain of patients undergoing spinal surgery.

Besides, Good, Anderson, Ahn, Cong, & Stanton-Hicks, (2005) conducted a randomized clinical trial to study the effectiveness of relaxation and music to reduce pain after intestinal surgery and found that both relaxation and music could reduce pain and suffering after the experiment during both ambulation and rest on the first and second postoperative days.

Satisfaction of Patients with Pain Management

Satisfaction is a feeling related to value and mind of individuals, which is a sensitive matter. Satisfaction can change with time or when the situation is changing (Anusaasananun, 1993). Satisfaction of patients with nursing care is an assessment of

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patients' perceptions of expected nursing care and actual nursing care received by patients, which also involve the sum of thinking and ideas, which, in turn, affects the following action and behavior (Risser, 1975 cited in Phattawee, 1998). Besides, patients' satisfaction can be used as an index to assess efficiency of both medical (Timoney, 1990 cited in Phattawee, 1998) and nursing services (Oberst, 1984 cited in Phattawee, 1998).

A review of literature on patients' satisfaction with pain relief and studies on quality of nursing care, nursing expectation, and perceptions and expectations of postoperative patients has revealed that patients who receive care regarding their pain and pain relief, who receive needed assistance, and who feel that doctors and nurses pay attention to their pain problems have satisfaction with pain management they receive (Yutithum, 1983; Kanogsunthornrat, 1992). On the contrary, patients who have expectation that they will receive assistance from doctors and nurses to relieve their pain but the actual assistance does not meet their expectation, and/or the intensity of pain exceeds their expectation will not be satisfied with pain management they receive from doctors and nurses (Chunlertskul, 1985; Cohen, 1980; Carr, 1990; Owen et al., 1990; Khun et al., 1991 cited in Patthawee, 1998).

Based on a review of literature, therefore, it can be concluded that the effects of pain management in postoperative patients depend on perceptions of all parties involved. If perception of pain of doctors and nurses is equal to or higher than that of patients, they will be able to make patients satisfied with their pain control efforts.

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CHAPTER III
METHODS

The present study was descriptive research which aimed at investigating pain; pain management by patients, doctors, and nurses; satisfaction of the patients with pain management that they received, and affects of pain on activities of daily living of patients undergoing abdominal hysterectomy patients during the first three days after the surgery.

Population and Sample

The target population of this study consisted of patients undergoing total abdominal hysterectomy during the first three days after surgery.

The sample of the study consisted of patients undergoing total abdominal hysterectomy during the first three days after surgery who were admitted into the gynecological ward and private obstetrics ward of Ramathibodi Hospital 110 cases.

Sampling Method

The sample was recruited by means of purposive sampling based on the following inclusion criteria:

Inclusion criteria

1. They were patients undergoing total abdominal hysterectomy.
2. They received general anesthesia during the operation.
3. They were 20 years old or older.
4. They were able to communication in the Thai language.
5. They were willing to participate in this research.

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Exclusion criteria

1. They had other chronic pain not related to the surgery they underwent.

2. They experienced postoperative complications that rendered removal of the endotracheal tube on the first postoperative day impossible.

Calculation of sample size

The formula proposed by Thorndike (cited in Srisathitnarakool, B., 2004) was used to calculate the sample size as follows:

$$n = 10k + 50$$

When n = sample size

k = number of study variables

As there were four variables in the study, the sample size was as follows:

$$n = 10(4) + 50$$
$$= 90$$

The acceptable sample size was equal to 90 cases. In this study, data were collected number of subjects who participated in the study was 110.

Research Setting

Data of this study were collected at the gynecological ward and private obstetrics ward of Ramathibodi Hospital, Bangkok, Thailand.

Gynecological ward: The patients with gynecology problem who come to surgery who were until 15 years old could stay in the gynecological ward. The unit consists 35 beds. A visiting hours restricted between 11.00 a.m. to 8.00 p.m. Gynecologists and staff nurses, working 3 shifts per day. This ward have 26 staff nurses divided 10 register nurses and 16 practical nurses. There were 2 to 4 register nurses and 3 to 5 practical nurses per shift.

Private obstetrics ward: The pregnant person who come to delivery or the patients with gynecology problem who come to surgery who were until 15 years old could stay in the private obstetrics ward. The unit consists 26 beds, which divided the bed for delivery person 12 beds and 6 single rooms. And the bed for gynecological

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patients 4 beds and 4 single rooms. A visiting hours restricted between 11.00 a.m. to 8.00 p.m. But could has 1 caregiver per 1 patient for 24 hours. Obstetricians, gynecologists and staff nurses, working 3 shifts per day. This ward have 30 staff nurses divided 14 register nurses and 16 practical nurses. There were 2 to 3 register nurses and 3 to 5 practical nurses per shift.

Two wards were provided as the training places for obstetric and gynecological specialists, medical students and nursing students. Both ward that have preoperative for the subjects 1 day before surgery. The every body of subjects will receive information from the register nurses follow as; in Gynecological ward give to watching VDO about uterus, ovary and affect will receive postoperative when the subjects removed uterus and ovary. The practice for the subjects in preoperative and postoperative day, include to demonstration and return demonstration about the method to wear the operative suit, affective cough, deep breathing exercise and movement. After that the nurses will give opportunity to ask the doubt. But in Private obstetrics ward the nurse was a person who gave this information. Duration of this activities about 30 minutes. In Gynecological ward start at 7.00 p.m. and Private obstetrics ward start at 8.00 p.m.

Research Instruments

1. Demographic data questionnaire consisting of 15 items divided into the following two parts:

1.1 Individual data of the sample including age, marital status, race, income, and education

1.2 Data about disease and treatment including diagnosis, past experience with surgery, experience with pain, type of surgery, duration of surgery, type of general anesthesia that received, medicine and pain management used during the first three days after surgery.

2. Pain questionnaire developed based on the patient assessment scale on postoperative pain assessment of the American Pain Society Questionnaire (1995) composed of 19 items:

2.1 Pain and pain intensity assessment consisted of five items that elicited data regarding pain intensity—most pain, least pain, and average pain. The patients

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were required to choose the number that directly reflect their feeling in the scale ranging from 0 to 10, with 0 indicating no pain, 5 indicating moderate pain, and 10 indicating most pain. There were six items in this part. The First five items (items 1 to 5) were closed-ended questions on pain intensity, while item 6 was an open-ended question that asked the subjects to indicate their response to pain.

2.2 Affects of pain assessment elicited data regarding how pain interfered with the subjects' different activities including emotion, movement, relationship, sleep, cough or deep breathing, and general activities. The subjects were required to choose the number that best represented their feeling in the scale ranging from 0 to 10, with 0 suggesting no interference, 5 suggesting moderate interference, and 10 suggesting most interference. There were 6 items in this part (items 7, 8, 9, 10, 11, and 12).

As for the determination of intensity and interference of pain with activities, the standard criteria of Serlin et al. (1995) were used. According to the criteria, levels of pain intensity and interference were divided into three levels as follows:

The scores of 1 to 4 meant that the patients perceived that intensity and interference of pain was at a low level.

The scores of 5 to 6 meant that the patients perceived that intensity and interference of pain was at a moderate level.

The scores of 7 to 10 meant that the patients perceived that intensity and interference of pain was at a high level.

2.3 Effectiveness of pain management strategies assessment required the subjects to choose the number that best corresponded to their feeling in a scale ranging from 0 to 10, with 0 meaning that pain was not relieved, 5 meaning that pain was moderately relieved, and 10 meaning that pain was completely relieved. Item 13 elicited data regarding effectiveness of pain management strategies, items 14 and 16 elicited data regarding medicine administration of nurses, and item 15 elicited data regarding additional medicines or new medicines the patients receive to manage pain.

3. Pain management strategies by patients, doctors, and nurses questionnaire designed from a review of literature consisting of the following parts:

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3.1 Pain management by doctors was assessed in item 17 which was a seven-point rating scale with the open-ended eighth choice given. The subjects were able to choose more than one response to indicate how the doctors managed their pain.

3.2 Pain management by nurses was assessed in item 18 which was a ten-point rating scale with the open-ended 11th choice given. The subjects were able to choose more than one response to indicate how the nurses managed their pain.

3.3 Pain management by patients was assessed in item 19 which was an eight-point rating scale with the open-ended ninth choice given. The subjects were able to choose more than one response to indicate how they managed their own pain.

4. Satisfaction with pain management questionnaire consisted of three questions that elicited data regarding patients' satisfaction with pain management strategies they received from the doctors, nurses, as well as the ones they initiated by themselves. The subjects were asked to choose the number that best represented their feeling in a scale ranging from 0 to 10, with 0 indicating no satisfaction, 5 indicating moderate satisfaction, and 10 indicating most satisfaction. Items 20-23 were closed-ended items, whereas item 23 was an open-ended question for the patients who were not satisfied with pain management they received to indicate their levels of dissatisfaction.

Effectiveness and satisfaction with pain management were divided into three levels also based on the criteria used to categorize the levels of pain intensity and interference to ensure consistency as follows:

The scores of 1 to 4 meant that the patients perceived that pain intensity decreased after pain management at a low level and they had a low level of satisfaction with pain management they received.

The scores of 5 to 6 meant that the patients perceived that pain intensity decreased after pain management at a moderate level and they had a moderate level of satisfaction with pain management they received.

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The scores of 7 to 10 meant that the patients perceived that pain intensity decreased after pain management at a high level and they had a high level of satisfaction with pain management they received.

Validation of Instruments

The patient assessment scale was developed from The American Pain Society Questionnaire (1995), and the items regarding pain intensity and pain interference were adopted from The Brief Pain Inventory (BPI) which was utilized extensively to assess pain. The validity and reliability of the instruments have been examined and confirmed in many languages. Serlin et al. (1995) validated the instruments and reported that alpha coefficient of intensity of pain and interference of pain questionnaires was equal to .87 and .87, respectively. Also, the questions on satisfaction with pain management were examined to ensure construct validity and reliability of each question by Ware et al. (cited in The American Pain Society Quality of Care Committee, 1995).

Luengsukcharoen (1997) adapted the patient assessment scale of Detroit Medical Center and Wayne State University by adjusting the language and submitting the instrument to a panel of experts to ensure language appropriateness. After that, the instrument was used with cancer patients, and Cronbach's Alpha Coefficient was calculated to determine the reliability of the instrument. The reliability of pain intensity and pain interference questionnaires were equal to.84 and .65, respectively.

Phattawee (1998) adapted the pain assessment scale from the patient assessment scale of Detroit Medical Center and Wayne State University developed based on the scale of The American Pain Society Questionnaire (1995). The levels of pain intensity, pain interference, effectiveness of pain management, and satisfaction with pain management were determined based on the criteria proposed by Serlin et al. (1995 cited in Phattawee, 1998). Moreover, the pain management by doctors, nurses, and patients questionnaire was constructed by the researcher based on an extensive review of literature, and the content validity and suitability of language were examined and confirmed by five experts—two experts in pain management, one

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expert in chest surgery, and two nursing instructors. The questionnaire was then revised and improved according to the experts' comments and suggestions. After that, the questionnaire was tried out with 20 postoperative patients undergoing cardiovascular thoracic surgery with median sternotomy. As for pain intensity, the Alpha coefficient was equal to .54, .84, and .86 on the first, second, and third operative days, respectively. As regards pain interference and satisfaction with pain management, the Alpha coefficient was equal to .77 and .69, respectively. The repeated measurement was then carried out with 100 subjects, and the Alpha coefficient was equal to .90, .90, and .88 on the first, second, and third operative days, respectively, while that of pain interference and satisfaction with pain management, the Alpha coefficient was equal to .73 and .64, respectively.

In this study, instruments of pain assessment scale adapted from the patient assessment scale of The American Pain Society Questionnaire (1995) were examined by a panel of five experts to ensure content validity and suitability of language. The experts consisted of one physician specializing in pain, two nursing instructors, one head nurse of the gynecology ward, and one nurse working in the gynecology ward. The instruments were revised based on the experts' comments and suggestions. After that, Cronbach's Alpha coefficient was used to determine internal consistency with 30 patients undergoing total abdominal hysterectomy. The Alpha coefficient was equal to .78, .89, and .91 on the first, second, and third operative days, respectively. As regards pain interference and satisfaction with pain management, the Alpha coefficient was equal to .83 and .87, respectively. The repeated measurement was then carried out with 110 subjects, and the Alpha coefficient was equal to .77, .87, and .88 on the first, second, and third operative days, respectively, while that of pain interference and satisfaction with pain management, the Alpha coefficient was equal to .81 and .77, respectively.

Protection of Human Samples

The data collection in this study was done on compass under protection of human subjects. Permission to conduct the study was requested from the Human Subjects Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University to ensure protection of the rights of human subjects. The research was

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begun to collect data after obtaining permission to conduct the study. The researcher explained the research objectives, the research process, benefits, duration of time for research cooperation, and the rights to refuse to participate in this study to the samples before they agreed and signed the consent form to participate in this study. In the that the samples were unable to read, the researcher would read the consent form and explain to them once again. The samples, who agreed to participate would be informed and assured that the data would be kept in strict confidence and presented as a group report. Moreover, the samples could request information about this study from the researcher all the times.

Data Collection

The research proposal was submitted to the Ethical Committee on Research Involving Human Subjects of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University to ensure protection of the rights of human subjects. After the approval was granted, the letter from the School of Graduate Studies, Mahidol University, was sent to the Dean of the Faculty of Medicine, Ramathibodi Hospital, to ask for permission to collect data. The study objectives and data collection procedures were described, and cooperation to participate in the research was also requested.

The researcher collected data from the sample who sought treatment at the gynecology ward and obstetrics ward of Ramathibodi Hospital in the following order:

1. The researcher met the head nurses of the gynecology ward and obstetrics ward of Ramathibodi Hospital to introduce herself, explain research objectives and data collection procedures, and ask for cooperation in data collection.

2. The researcher checked the name list of the patients one day before operation. The scheduled total abdominal hysterectomy using the record of preparation for the operation of the gynecology ward and obstetrics ward of Ramathibodi Hospital to select the patients who met the inclusion criteria of the study.

3. The researcher introduced herself to the patients, described research objectives and data collection procedures, informed the patients of protection of human rights, and asked for cooperation to participate in the study.

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4. After the patients agreed to participate in this research, the researcher explained how to fill out the questionnaires and gave them opportunity to ask questions to clarify their doubts or misunderstanding. If the patients were unable to read the Thai language, the researcher would read the items contained in the questionnaires and asked them to verbally choose the responses.

5. On the first, second, and third postoperative days, the researcher assessed the patients' pain intensity by asking them to respond to the questionnaire by choosing the answers that best represented their feeling. This step about 20 minutes.

6. On the third day after the operation, the researcher assessed the patients' responses to pain; pain management used by doctors, nurses, and patients; affects of pain on activities of daily living, and satisfaction with pain management by asking the patients to respond to the questionnaires by choosing the answers that best represented their feeling. This step about 30 minutes.

7. After the patients finished filling out the questionnaires, the researcher checked the questionnaires to ensure completeness of the data.

8. The researcher recorded the patients' demographic data—individual data including age, marital status, race, income, and education and data concerning disease and treatment including diagnosis, experience with operation, experience with pain, type of operation, duration of operation, general anesthesia received, medication, and pain management received during the first three days after the operation by studying the patients' chart and records of medications given by nurses.

Data Analysis

Data were analyzed using the SPSS package as follows:

1. Frequency and percentage were used to analyze demographic data of the study sample.

2. Mean, range, and standard deviation were calculated for additional analysis of the sample's age and duration of the operation.

3. The means of pain levels during assessment, most pain, least pain, and average pain during the first three days after the operation were compared by Friedman Test.

4. Percentage was employed to analyze pain management strategies used by patients, doctors, and nurses.

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5. Additional analysis was also carried out regarding painkillers the subjects received on each day, the number of times painkillers were administered, and pharmaceutical pain management administered by nurses using frequency and percentage. Mean, range, and standard deviation were also used to additionally analyze the number of times the subjects received painkillers on each postoperative days.

6. The affects of pain on activities of daily living during the first three days after the operation were analyzed by means of range, mean, and standard deviation. Spearman's Rho Rank Correlation Coefficient was also employed to determine the relationship between most pain and affects on activities of daily living.

7. Mean, range, and standard deviation were used to analyze patients' satisfaction with pain management received from doctors and nurses, as well as overall satisfaction with pain management.

In this study used nonparametric tests because the variables that have measured in the samples are not normally distribution, often are called "distribution free".
The nonparametric tests that used follow as:

Friedman Test used when the samples are analogous to a repeated measure analysis of variance and used in within subjects designs when subjects serve as their own controls or outcome variables are measured more than once.

Spearman's Rho Rank Correlation Coefficient will use when want to measure the relationship or correlate of two sets of ranks and could be compare the ranking of the two groups (Munro, 2001).

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CHAPTER IV
RESULTS

In this chapter, the study findings are presented in the following order: demographic characteristics of the subjects; pain in the first three days after the operation; affects of pain on activities of daily living; pain management strategies used by patients, doctors and nurses; and satisfaction with pain management strategies used by doctors, nurses, and overall.

Demographic Characteristics of the Subjects

The subjects were 110 patients who were admitted into the gynecology ward and obstetrics ward of Ramathibodi Hospital. Their age ranged from 31 to 73 years old, with the mean age of 46.3 years. More than three quarters, or 79.1%, were between 41 and 60 years old (Table 2). As for marital status, 70% were married. In addition, 99.1% were Thai and 98.2% were Buddhists. With regard to income, approximately one-third, or 32.7%, had an income higher than 20,000 baht per month. Also, more than half graduated with a bachelor's degree. In terms of pain, 53.6% had experience with surgery in the past, and 70% had past experience with pain. As regards their diagnosis, 53.6% had uterine tumors, and 42.7% had total abdominal hysterectomy with ovarian ablation (Table 1). Finally, the duration of surgery ranged from two hours to two hours and 59 minutes for almost half, or 48.2%, of the subjects, with the mean duration of two hours and seven minutes (Table 2).

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Table 1: Demographic characteristics of the subjects (N = 110).

Demographic characteristics	Number	Percentage
Marital status		
Single	22	20.0
Married	77	70.0
Widowed/divorced/separated	11	10.0
Race		
Thai	109	99.1
Others	1	0.9
Religion		
Buddhists	108	98.2
Others	2	1.8
Income (Baht/month)		
None	23	20.9
< 5,000	7	6.4
5,000 – 10,000	14	12.7
10,001 – 15,000	10	9.1
15,001 – 20,000	20	18.2
> 20,000	36	32.7
Education		
Primary school	25	22.7
Secondary school	12	10.9
Certificate	18	16.4
Bachelor's degree or higher	55	50.0
Experience with operation		
Yes	59	53.6
No	51	46.4
Experience with pain		
Yes	77	70.0
No	33	30.0

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Table 1: Demographic characteristics of the subjects (N = 110) (continued)

Demographic characteristics	Number	Percentage
Diagnosis		
Myoma uteri	59	53.6
Endometriosis	25	22.7
Others (Receiving combined diagnosis i.e. Myoma uteri with ovarian tumor or with endometriosis with adenomyosis)	10	9.1
Malignant neoplasm of endometrium	9	8.2
Ovarian tumor	7	6.4
Type of surgery		
TAH	27	24.5
TAH c BSO	47	42.7
Others	36	32.7

Table 2: Demographic characteristics of the subjects as categorized according to age and duration of surgery (N = 110)

Demographic characteristics	Number	Percentage
Age (Years)		
20 – 40	17	15.5
41 – 60	87	79.1
> 60	6	5.5
Mean = 46.3 years		
Duration of surgery		
1 hour – 1 hour 59 minutes	45	40.9
2 hours – 2 hours 59 minutes	53	48.2
3 hours and longer	12	10.9
Mean duration of surgery = 2 hours 7 minutes		

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Objective 1: To study pain during the first three days after total abdominal hysterectomy

Table 3: Comparison of pain levels during assessment, most pain, least pain, and average pain on first, second, and third postoperative days using Friedman test (N = 110)

Pain	Postoperative	Range	Pain		χ^2	p
			$\bar{X}$	S.D.		
During assessment	Day 1	0-8	3.64	2.27	94.531	.000
	Day 2	0-9	2.02	1.91		
	Day 3	0-7	1.25	1.36		
Most	Day 1	2-10	8.07	2.23	167.032	.000
	Day 2	0-9	4.04	2.19		
	Day 3	0-9	2.45	1.96		
Least	Day 1	0-9	2.91	2.11	91.454	.000
	Day 2	0-5	1.44	1.44		
	Day 3	0-5	0.76	1.00		
Average	Day 1	1-10	5.17	1.83	157.527	.000
	Day 2	0-6	2.77	1.66		
	Day 3	0-7	1.58	1.40		

In this study, pain during assessment, most pain, least pain, and average pain during the first three days after the operation were investigated. The findings were as follows:

As regards pain during assessment, the level of postoperative pain of patients during the first, second, and third days was at a low level, with the mean scores of 3.64, 2.02, and 1.25, respectively.

As for most pain, the level of postoperative pain of patients during the first day was at a high level, with the mean score of 8.07, whereas the level of postoperative

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pain during the second and third days was at a low level, with the mean scores of 4.04 and 2.45, respectively.

With regard to least pain, the level of postoperative pain of patients during the first, second, and third days was at a low level, with the mean scores of 2.91, 1.44, and 0.76, respectively.

Regarding average pain, the level of postoperative pain of patients during the first day was at a moderate level, with the mean score of 5.17, while the level of postoperative pain during the second and third days was at a low level, with the mean scores of 2.77 and 1.58, respectively.

When considering the mean scores of pain, it was found that the mean scores of pain during assessment, most pain, least pain, and average pain were highest on the first postoperative day and were lowest on the third postoperative day (Table 3).

When comparing the pain levels during assessment, most pain, least pain, and average pain on the first, second, and third postoperative days, Friedman test revealed that the levels of pain during assessment, most pain, least pain, and average pain on the first, second, and third postoperative days were statistically significantly different at $p < .001$ level (Table 3).

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Objective 2: To investigate pain management strategies for total abdominal hysterectomy patients used by patients, doctors and nurses.

Table 4: Pain management strategies used by patients (N = 110)

Pain management strategies*	Number	Percentage
Changing position for comfort	109	99.1
Using slow and deep breathing	99	90.0
Softly patting the skin near the wound	77	70.0
Thinking happy thoughts	66	60.0
Reading/seeing photos/chatting with others/ listening to music	65	59.1
Praying	57	51.8
Immediately informing doctors or nurses when feeling pain	50	45.5
Doing meditation/praying	43	39.1
Others	21	19.1

*The subjects could select more than one pain management strategy

As regard pain management strategies used by patients, the most frequently used pain management strategy was changing the position for comfort, which was used by 99.1% of the subjects. This was followed by using slow and deep breathing, as it was used by 90.0% of the subjects. Softly patting the skin near the wound ranked third, as this strategy was used by 70.0% of the subjects (Table 4).

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Table 5: Pain management strategies the subjects received from doctors (N = 110)

Pain management strategy*	Number	Percentage
Showing interest and asking about pain symptoms	104	94.5
Giving advice to change position	93	84.5
Telling patients to ask for painkillers when feeling pain	89	80.9
Advising patients to use slow and deep breathing	87	79.1
Giving information about surgery and pain or giving explanation to relieve anxiety	86	78.2
Reassuring patients that painkillers would be prescribed when needed	86	78.2
Giving encouragement and showing understanding and sympathy	76	69.1
Others	2	1.8

*The subjects could receive more than one pain management strategies

As for pain management strategies used by doctors, the most frequently used pain management strategy was showing interest and asking about pain symptoms, which was received by 94.5% of the subjects. This was followed by giving advice to change position, as it was received by 84.5% of the subjects. Telling the patients to ask for painkillers when feeling pain ranked third, as this strategy was received by 80.9% of the subjects (Table 5).

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Table 6: Pain management strategies the subjects received from nurses (N = 110)

Pain management strategy*	Number	Percentage
Showing interest and asking about pain symptoms	107	97.3
Advising patients to inform nurses when feeling pain or ask for painkillers	103	93.6
Advising patients to change position and support their wound when coughing	100	90.9
Giving assistance with different activities while feeling pain	96	87.3
Giving information about surgery and pain or giving explanation to relieve anxiety	78	70.9
Asking about outcomes after administration of painkillers	76	69.1
Giving encouragement and showing understanding and sympathy	59	53.6
Giving opportunity for relation stay with patients so long time while feeling pain	55	50.0
Advising patients to read, see photos, or talk with others	22	20.0
Advising patients to think happy thoughts	21	19.1

*The subjects could receive more than one pain management strategies

When considering pain management strategies used by nurses, it was found that the most frequently used pain management strategy was showing interest and asking about pain symptoms, which was received by 97.3% of the subjects. This was followed by giving advice to ask for painkillers when feeling pain, as it was received by 93.6% of the subjects. Advising the patients to change position and supporting their wound while coughing ranked third, as this strategy was received by 90.9% of the subjects (Table 6).

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Table 7: Number of times and percentage of painkillers the subjects received during the first three days after surgery (N = 110)

Type of Painkillers*	routes	Postoperative day 1			Postoperative day 2			Postoperative day 3		
		Sample (N)	Times (N)	%	Sample (N)	Times (N)	%	Sample (N)	Times (N)	%
Pethidine	IV	82	263	74.55	8	18	7.27	-	-	-
Morphine	IV	32	86	29.09	3	13	2.73	1	1	0.91
Dynastat®	IV	39	57	35.45	6	8	5.45	1	2	0.91
Dyclofenac	IM	18	19	16.36	2	2	1.82	2	2	1.82
Dyclofenac	Oral	-	-	-	1	1	0.91	-	-	-
Synflex	Oral	-	-	-	76	76	69.09	76	182	69.09
Celebrex	Oral	-	-	-	9	9	8.18	8	13	7.27
Paracetamol	Oral	19	19	17.27	59	92	53.64	28	33	25.45
Ultracet	Oral	-	-	-	8	8	7.27	7	20	6.36

*The subjects may have received more than one type of painkillers.

With regard to pharmaceutical pain management strategies, the findings revealed that on the first postoperative day, 74.55% of the subjects received Pethidine injection, while 35.45% received Dynastat® injection. On the second postoperative day, 69.09% of the subjects received oral medication called Synflex, and on the third postoperative day, 53.64% of the subjects received oral medication called Paracetamol (Table 7).

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Table 8: Percentage of pharmaceutical pain management used by nurses (N= 110)

Management	Number	Percentage
Reception of medicines from nurses when having pain		
Asking for painkillers	67	60.9
Not asking for painkillers	43	39.1
Waiting period after asking for painkillers from nurses		
< 10 minutes	56	50.9
11 – 20 minutes	7	6.4
21 – 30 minutes	2	1.8
More than 60 minutes	1	0.9
Asking for painkillers but not receiving any	1	0.9
Never asking for painkillers (receiving continuous medications according to treatment plan)	43	39.1
Waiting period after asking for additional painkillers from nurses (13 subjects)		
< 1 hour	10	76.9
1 – 2 hours	2	15.4
> 24 hours	1	7.7
Effectiveness of pain management		
Ineffective	3	2.7
Pain relief at a low level	2	1.8
Pain relief at a moderate level	17	15.5
Pain relief at a high level	88	80.0

When considering pharmaceutical pain management strategies used by nurses, it was discovered that 60.9% of the subjects asked for painkillers when they had pain on postoperative day 1. After the subjects asked for painkillers, 98.51% of the subjects received painkillers. Furthermore, 50.9% of the subjects received painkillers less than ten minutes after making a request to the nurses, and 39.1% of them received continuous pain management according to the treatment plan.

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As regards the effectiveness of pain management, about 80% of the subjects perceived that their pain was relieved at a high level after administration of painkillers (Table 8).

Objective 3: To determine the affects of pain on activities of daily living of patients undergoing total abdominal hysterectomy during the first three days after surgery

Table 9: Range, mean, and standard deviation of the affects of pain on activities of daily living of the subjects (N=110)

Items	Affects on activities of daily living			
	Range	Mean	Standard deviation	Level
Coughing and deep breathing	0-10	3.32	3.10	Low
Movement	0-10	2.85	2.80	Low
Sleep	0-10	2.39	3.00	Low
Emotion	0-10	1.93	2.47	Low
Other activities	0-10	1.70	2.59	Low
Relationship with other persons	0-9	1.10	2.25	Low

Other activities such as wash face, brush the teeth, have a meal, etc.

The findings indicated that pain interfered with activities of daily living of the subjects in terms of coughing and deep breathing, movement, and sleep at a low level, with the mean scores of 3.32, 2.85, and 2.39, respectively (Table 9).

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Table 10: Spearman's Rho Rank Correlation Coefficient between most pain and affects on activities of daily living of the subjects (N=110)

Most pain	r_s	p
Coughing and deep breathing	.190	.047
Movement	.320	.001
Sleep	.257	.007
Emotion	.320	.001
Other activities	.139	.148
Relationship with other persons	.195	.042

According to the study findings, most pain was found to be positively correlated with affects of pain on activities of daily living of the subjects. First, most pain was positively correlated with movement and emotion with statistical significance at the $p < .001$ level. Secondly, most pain was positively correlated with sleep with statistical significance at the $p < .001$ level. Thirdly, most pain was positively correlated with coughing and deep breathing and relationship with other persons with statistical significance at the $p < .05$ level. However, there was no statistically significant relationship between most pain and other activities ($p > .05$) (Table 10).

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Objective 4: To explore satisfaction with pain management of patients undergoing total abdominal hysterectomy

Table 11: Range, mean, and standard deviation of satisfaction with pain management of the subjects (N= 110)

Pain management	Satisfaction			
	Range	Mean	Standard deviation	Level
Doctors'	3-10	8.71	1.63	high
Nurses'	5-10	8.39	1.60	high
Overall	3-10	8.55	1.94	high

The study findings revealed that the subjects had satisfaction with pain management strategies used by doctors, pain management strategies used by nurses, and overall satisfaction with pain management at a high level, with the mean scores of 8.71, 8.39, and 8.55, respectively (Table 11).

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CHAPTER V
DISCUSSION

In this chapter, the research findings are discussed in the following topics: postoperative pain; affects of pain on activities of daily living; pain management strategies used by patients, doctors and nurses; and satisfaction with pain management strategies received from doctors, nurses, and overall of patients undergoing total abdominal hysterectomy.

Postoperative Pain

According to the study finding, on the first postoperative day, the mean of most pain of the subjects was at a high level. This is because total abdominal hysterectomy is a major operation and an incision is made on the abdominal surface in a vertical line in the midline area and pfannenstiel line (horizontal) through the skin, subcutaneous fat, Scarpa's fascia, rectus sheath, rectus abdominis muscles, pyramidalis muscles, properitoneal fat, and peritoneum (Baggish, 2001). As a result, it causes damages to tissues, muscles, ligaments, fascias, blood vessels, and nerves (Gilstraps, et al., 2003), resulting in pain. In general, patients undergoing total abdominal hysterectomy have moderate to severe pain (Gupta, et al., 2004).

In addition, the duration of total abdominal hysterectomy is generally long. In this study, the mean duration of the surgery was 127 minutes, which was similar to the study of Sarmini, et al. (2005) which found that the average time for total abdominal hysterectomy was 115 minutes. Likewise, Panyim (2000) found that the average time for this type of surgery was 122 minutes. After the surgery, the patients will experience pain which can be explained in terms of tissue injury that when the tissues, blood vessels, abdominal surface area nerves and the uterus are destroyed with the surgery knife, the nerve endings in these organs will be stimulated and send

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neurotransmitters to the gate control system at the spinal cord. When the gate is opened, following the gate control theory, the sensation of pain will result (Hinjiranan, Kittisup, Chaiseree, Sattayavivat & Tosingha, 1996).

The findings of this study corresponded with the findings of Good et al. (2000) who investigated pain after gynecologic surgery of 80 patients who received surgical procedures including abdominal hysterectomy, oophorectomy, and laparotomy. The findings indicated that one-fourth of the subjects suffered from severe sensation of pain on the first postoperative day (Good et al., 2000).

On the second and third postoperative days, the subjects had the mean of average pain at a low level. This can be explained that the findings followed the mechanisms of postoperative pain as secretory substances that stimulate small nerve fibers to send pain signals to the brain are abundant in the first stage after surgery and they will decrease as time passes by. The results of this study were consistent with those of Chaikla (2002) found on the third postoperative days, the subjects had the mean of average pain at a low level, but second postoperative days, the subjects had the mean of average pain at a moderate level. And consistent with those of Chaichart, Petpichetchian and Phumdoung (2006) found on the third postoperative days, the subjects had the mean of average pain at a low level, but second postoperative days, the subjects had the mean of average pain at a moderate level.

Pain Management Strategies

The pain management strategy that was most frequently used by the subjects was changing position for comfort. The reason why this particular strategy was mostly used by the subjects was that they felt tired from lying down in only one position for a long time, and they learned that by gradually turning themselves would help decrease pain. Besides, the subjects were stimulated by doctors and nurses to change their positions to prevent postoperative complications. The results of this study were consistent with those of Kanogsunthornrat (1992), Patthawee (1998) and Chinnoros, Suwanwecho and Kotchasenee (2006) that the strategy mostly used by postoperative patients to manage pain was changing position for comfort.

Furthermore, the most frequently used pain management strategy of doctors was showing interest and asking about pain. The subjects assessed that the fact that

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doctors came to visit them everyday to follow up on their symptoms and ask about their pain showed that the doctors paid attention to them, thus making them feel warm and well cared for. This could be explained that such perception and assessment will send negative feedback from the brain down to the pain control mechanism at the spinal cord, and this decreases intensity of nerve signals of T cells that send data to the brain (Chinnoros, Patthawee & Supanchart, 2000). Likewise, Patthawee (1998) found that doctors' pain management used with postoperative patients was showing interest by asking about pain symptoms.

Similarly, the pain management strategy that nurses used most was showing interest and asking about pain. The subjects explained that when nurses came check up on their symptoms every eight hours and asking about their pain showed that nurses paid attention to them. Such gesture made them feel warm. Again, it can be explained that the patients' perception of nurses' care and attention to them sends negative feedback from the brain down to pain control mechanism at the spinal cord, which then decreases intensity of nerve signals of T cells that send data to the brain (Chinnoros, Patthawee and Supanchart, 2000). The results of this study were congruent with the studies of Patthawee (1998) and Chinnoros, Suwanwecho and Kotchasenee (2006) that pain management strategy nurses most frequently used with postoperative patients undergoing cardiovascular thoracic surgery by median sternotomy and postoperative patients with total knee arthroplasty was showing interest by asking about pain. A similar finding was also reported by Rattanasukon (2001) that the pain management strategy mostly used by nurses with gynecological cancer patients was showing anxiety and asking about their symptoms.

Affects of pain on activities of daily living

As regards affects of pain on activities of daily living in the first three days after surgery, the study findings revealed that the mean score of affect of pain on coughing and deep breathing was higher than the others. This can be explained that even though the subjects received total abdominal hysterectomy, the abdominal surface muscle is located close to the diaphragms, major organs used in breathing and coughing. When the patients cough and breathe deeply, it will stimulate the operated and injured muscles to contract, and this stimulates small nerve fibers to cause

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increased pain. Besides, the wound is very sensitive to stimulation, and this causes patients to experience severe pain despite minor stimuli. The findings of this study were in congruence with the finding of Patthawee (1998) that pain disturbed coughing and deep breathing in postoperative patients with cardiovascular thoracic surgery by median sternotomy more than others.

Besides, it was also found that most pain was positively related to affects of pain on coughing and deep breathing with statistical significance ($r_s = .19$, $p < .05$). This showed that when the subjects who received total abdominal hysterectomy increased pain, that would be affected more their coughing and deep breathing.

Satisfaction with Pain Management

The study findings revealed that the majority of the subjects had satisfaction with pain management received from doctors, satisfaction with pain management received from nurses, and overall pain management at a high level. Although on the first postoperative day the subjects had most pain at a high level, their pain during assessment and least pain were at a low level, and average pain was at a moderate level. Also, the affects of pain were mostly at a low level, and most of the subjects felt that the level of pain decreased as they expected.

Besides, most of the subjects perceived that doctors and nurses paid attention to them and asked them about their pain. Chairat (2002) points out that when doctors and nurses ask about and listen to patients' problems, which mostly concern their pain, patients feel satisfied with the care they receive. Put another way, the patients feel that doctors and nurses are willing to take care of them, and this leaves them with a positive impression. Similarly, Patthawee (1998) found that the patients who received cardiovascular thoracic surgery by median sternotomy reported that doctors and nurses had interest and paid attention to the pain they were experiencing, and this made them feel satisfied with pain management used by doctors and nurses at a high level.

In addition to showing interest and asking about pain symptoms, doctors and nurses also advised the subjects to ask for painkillers when they felt pain. On the first postoperative day, the subjects had most pain at a high level, so they received

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strong painkiller injections belonging to the opioid group including pethidine (74.55%). Pethidine is in an μ agonist group which is generally used to relieve severe pain. It works at the supraspinal and spinal levels. At the supraspinal level, pethidine works through stimulation of the descending inhibitory pathway (Itthichaikoontol, Waikakul & Paosawat cited in Chaudakasetrin, et al., 2004). The second group of painkillers that the subjects received was the NSAIDs group including parecoxib (Dynastat®) (35.45%). The drugs in this group help relieve inflammation and postoperative pain by inhibiting the cyclooxygenase (COX)-2 enzyme which affects the injured area (Peapack, 2002). On the other hand, some of the subjects received oral painkillers, as 17.27% received paracetamol which works by affecting the central nervous system as well as the injured abdominal hysterectomy area.

Finally, according to the study findings, when the doctors and nurses informed the subjects that they were able to ask for painkillers if they felt they needed them, 60.9% of the subjects asked for painkillers. Moreover, approximately half, or 50.9%, had to wait for less than ten minutes for the nurses to administer the painkillers, which means they did not have to wait long. When considering the effectiveness of the medication, the subjects felt that their pain decreased at a high level after taking painkillers. Therefore, based on these reasons, the subjects developed a high level of satisfaction with pain management they received from doctors and nurses.

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CHAPTER VI
CONCLUSION

Summary of Findings

The present descriptive research aimed at investigating postoperative pain after total abdominal hysterectomy during the first three days after the operation; pain management methods used by patients, doctors, and nurses; affects of pain on activities of daily living, and satisfaction with pain management of the sample. The Model of Symptom Management of Dodd (Dodd et al., 2001) was employed as a conceptual framework of the study.

The sample of this study consisted of 110 patients undergoing abdominal hysterectomy who had been admitted at the gynecological ward and private obstetrics ward of Ramathibodi Hospital for three days after the operation between October and November 2006. The subjects were recruited by means of purposive sampling based on the following inclusion criteria: 1) the patients underwent total abdominal hysterectomy; 2) they received general anesthesia; 3) they were at least 20 years of age; 4) they were able to communicate in the Thai language; and 5) they agreed to participate in this research.

Data were collected by means of self-administered questionnaires as follows:

1. Demographic data record form consisting of ten items divided into two parts: personal data and disease and treatment data

2. Pain assessment form adopted from the patient questionnaire of The American Pain Society Questionnaire (1995) to elicit data relating to pain of cancer patients and hospitalized patients with acute pain

This instrument was divided into four parts as follows:

2.1 Pain and intensity of pain assessment including pain during assessment, most pain, least pain, and average pain

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2.2 Affects of pain on activities of daily living including emotion, movement, relationship, sleep, cough or deep breathing, and other activities

2.3 Efficiency of pain management methods

2.4 Satisfaction with pain management, including satisfaction with pain management methods received from the doctors, nurses, and overall satisfaction with pain management

3. Questionnaire of pain management methods by the doctors, nurses, and patients designed from literature reviewed.

As regards validation of the instruments, five experts were asked to examine the instruments to ensure content validity and language appropriateness. With regard to reliability, the instruments were tried out with 30 subjects who shared similar characteristics with the subjects of the main study. Alpha coefficient of the pain assessment form was .78, .89, and .91, respectively, while that of the affects of pain on activities of daily living and satisfaction with pain management questionnaires was .83 and .87, respectively.

The research results showed that there were a total of 110 abdominal hysterectomy patients in the first three days after the operation who were admitted in the gynecological ward and obstetrics ward of Ramathibodi Hospital. Their age ranged from 31 to 73 years, with the average age of 46.3 years. More than three-quarters (79.1%) were between 41 and 60 years old. In addition, 70% were married, 99.1% were Thai, and 98.2% were Buddhists. Also, about one-third, or 32.7%, earned more 20,000 baht per month, and more than half graduated with a bachelor's degree. In terms of health history, 53.6% and 70% had experience with operation and experience with pain, respectively. When considering their medical diagnoses, it was found that 53.6% had myoma uteri, and 42.7% received a surgery procedure which was total abdominal hysterectomy with oophorectomy. For close to half, or 48.2%, the duration of their surgery was 2 hours to 2 hours 59 minutes, with the average of two hours and seven minutes. All subjects, or 100%, received intraoperation medicines including the narcotic group, muscle relaxant, and anesthesia.

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1. As regards the postoperative pain during the first three days, the average of most pain on the first postoperative day was at a high-level, while the level of pain during assessment on average and least pain on average were at a low level. The average pain on the first day after the operation was at a moderate level.

In addition, the subjects' levels of pain during assessment, average of most pain, average of least pain and average of overall pain on the second and third postoperative days were at a low level.

When comparing the averages of pain during assessment, most pain, least pain, and average pain on the first, second, and third postoperative days, it was that difference were statistically significant at $p < .001$.

2. Pain management methods that patients used and received from doctors and nurses

1) As for pain management methods initiated by the subjects, the most frequently used pain management method was changing the position for more comfort, as this was used by 99.1% of the subjects. This was followed by slow and deep breathing, chosen by 90% of the subjects. Patting softly on skin near the wound ranked third, used by 70% of the subjects.

2) In terms of pain management methods by doctors, the pain management method the subjects most frequently received from the doctors was showing interest and asking about pain, as 94.5% of the subjects received this from their doctors. This was followed by giving advice on changing position, as it was received by 84.5% of the subjects. Telling the patients to ask for painkillers when feeling pain ranked third, as 80.9% of the subjects received this method from the doctors.

3) In terms of pain management methods by nurses, the pain management method the subjects most frequently received from the nurses was showing interest and asking about pain, as 97.3% of the subjects received this from their nurses. This was followed by suggesting the patients to let nurses know when pain started and to ask for pain killers when feeling pain, as 93.6% of the subjects received this from their nurses. Finally, advising the patients to change position and advising the patients to breath deeply and use both hands to support their wound while coughing, as 90.9% of the subjects received this method from the nurses.

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4) Pharmaceutical pain management

4.1 As regards pharmaceutical pain management used by doctors, it was found that the painkillers that doctors used with the subjects on the first postoperative day were pethidine injection, accounting for 74.55%, and Dynastat® injection, making up 35.95%.

4.2 As for pharmaceutical pain management used by nurses, the findings showed that when the subjects had pain, 60.9% asked for painkillers, and they waited for medicine administration from nurses for least than ten minutes.

5) With regard to perception of effectiveness of pain management, the subjects perceived that 80% of the subjects felt that their pain was relieved.

3. The affects of pain on activities of daily living, pain disturbed activities of daily living including movement, sleep, emotion, relationship with other persons, cough and deep breathing, and other activities (such as wash face, brush the teeth, have a meal, etc) at a low level.

When examining the relationship between most pain and affects on each of the activities of daily living, it was found that most pain was positively related to affects on each of the activities of daily living. That is, most pain was positively related to movement and emotion with statistical significance at $p < .001$ level ($r_s = .32$ and .32, respectively), most pain was positively correlated with sleep with statistical significance at $p < .01$ level ($r_s = .257$), and most pain was positively associated with cough and deep breathing and relationship with other persons with statistical significance at $p < .05$ level ($r_s = .047$ and .042, respectively). However, most pain was not statistically significantly related other activities ($p > .05$, $r_s = .148$).

4. Regarding satisfaction with pain management, the subjects' satisfaction with pain management received from doctors, nurses, and overall satisfaction was at a high level.

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Recommendations

1. Nursing practice

The results of the research revealed that on the first postoperative day, although the subjects received painkillers, the level of most pain was still at a high level. In other words, even though the subjects had initiated non-pharmaceutical pain management methods and received medication from doctors and nurses, they were able to relieve their pain only to a certain extent. Based on these findings, doctors and nurses should find ways to increase the effectiveness of pain management methods by using both pharmacological and non-pharmacological pain management methods such as evaluation of doses, route and effectiveness of painkillers or relaxation techniques or music therapy, etc.

2. Nursing education

The results of this research that had the class for preparation the subjects before operation about pain after operation, advice to ask for painkillers, activity daily living after operation, etc., could be used to design a nursing curriculum or handbooks to equip nursing students with the knowledge and understanding about effective pain management as soon as they begin to study pain management.

3. Nursing research

Further studies should be conducted to investigate pain and pain management in other groups of postoperative patients such as those undergoing abdominal cavity surgery or surgery of the gastrointestinal tract. Non-pharmaceutical pain management techniques such as music therapy and relaxation techniques should also be combined with the use of painkillers as the findings of this study showed that the level of pain of the patients on the first postoperative day was at the highest level.

And should be to study about factor that influence for postoperative pain of total abdominal hysterectomy patients follow by Symptom Management Model of Dodd, 2001.

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APPENDIX

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APPENDIX A

คำชี้แจงสำหรับผู้ป่วย และการพิทักษ์สิทธิ์ของผู้ป่วยในการเข้าร่วมการวิจัย

"สวัสดีค่ะ คุณ..... ดิฉัน ขวัญจิตร์ ปุ่นโพธิ์ เป็นนักศึกษาพยาบาลปริญญาโท มหาวิทยาลัยมหิดล มีความสนใจจะศึกษาวิจัยในเรื่อง ความปวด การจัดการกับความปวด และความพึงพอใจต่อการจัดการกับความปวดในผู้ป่วยหลังผ่าตัดมดลูกออกทางหน้าท้องใคร่ขอความร่วมมือและยินยอมจากคุณเข้าร่วมโครงการวิจัย วิธีการวิจัยครั้งนี้จะเป็นการสัมภาษณ์และการตอบแบบถามเกี่ยวกับความรู้สึกปวดที่เกิดขึ้นกับคุณ การจัดการกับความปวดและความพึงพอใจต่อการจัดการกับความปวดในระยะ 3 วันแรกหลังผ่าตัด โดยดิฉันจะสอบถามเกี่ยวกับความปวดของคุณทุกวัน วันละครั้ง ติดต่อกันรวม 3 วัน และเริ่มสอบถามหลังจากที่คุณได้รับการผ่าตัดแล้วครบ 1 วัน ข้อมูลของคุณจะถูกเก็บไว้เป็นความลับ คุณมีสิทธิ์ที่จะปฏิเสธการเข้าร่วมโครงการและการที่คุณจะเข้าร่วมหรือไม่เข้าร่วมโครงการจะไม่มีผลใดๆ ต่อการรักษาพยาบาลที่คุณจะได้รับจากเจ้าหน้าที่ คุณมีข้อสงสัยประการใดหรือไม่คะ ถ้าหากมีข้อข้องใจหรือมีความกังวลใจเกี่ยวกับวิธีดำเนินการวิจัยของโครงการนี้ สามารถติดต่อได้ที่ ประธานกรรมการจริยธรรมการวิจัยในคน คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี หน่วยจริยธรรมการวิจัยในคนชั้น 3 สำนักงานวิจัยคณะฯ อาคารวิจัยและสวัสดิการ โทรศัพท์ 02-2011544 ในเวลาราชการค่ะ ขอบคุณคุณ.....ที่ให้ความร่วมมือค่ะ"

ขวัญจิตร์ ปุ่นโพธิ์

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คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล
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Documentary Proof of Ethical Clearance Committee on Human Rights Related to Researches Involving Human Subjects Faculty of Medicine, Ramathibodi Hospital, Mahidol University

MURA2006/244

Title of Project	Pain, Pain Management and Satisfaction for Pain Management in Total Abdominal Hysterectomy Patient
Protocol Number	ID 07-49-01
Principal Investigator	Miss. Kwanjit Punpho
Official Address	Department of Nursing Faculty of Medicine, Ramathibodi Hospital Mahidol University

The aforementioned project has been reviewed and approved by Committee on Human Rights Related to Researches Involving Human Subjects, based on the Declaration of Helsinki.

Signature of Secretary Committee on Human Rights Related to Researches Involving Human Subjects	..... Assoc. Prof. Duangrurdee Wattanasirichaigoon, M.D.
Signature of Chairman Committee on Human Rights Related to Researches Involving Human Subjects	..... Prof. Boonsong Ongphiphadhanakul, M.D.
Date of Approval	July 19, 2006

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APPENDIX B

แบบบันทึกข้อมูลส่วนบุคคล

ส่วนที่ 1 ข้อมูลส่วนบุคคล

1. อายุ..... ปี
2. เชื้อชาติ..... ศาสนา.....
3. เลขประจำตัวผู้ป่วย.....
4. สถานภาพสมรส
   (1) โสด.....
   (2) คู่.....
   (3) หม้าย หย่า แยก.....
5. ระดับการศึกษา.....
6. รายได้.....

ส่วนที่ 2 ข้อมูลเกี่ยวกับโรคและการรักษา

7. การวินิจฉัยโรค.....
   การผ่าตัดในอดีต.....
8. ความปวดในอดีต
   ..... (1) มี ระบุ.....
   ..... (2) ไม่มี
9. การผ่าตัด..... ระยะเวลาในการผ่าตัด.....นาที
10. ยาที่ผู้ป่วยได้รับเพื่อบรรเทาปวด
    ชนิด.....
    ปริมาณ.....
    วิธี ฉีด..... รับประทาน..... อื่นๆ.....

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แบบสอบถามเกี่ยวกับความปวด (หลังผ่าตัดวันที่ 1)

กรุณาทำเครื่องหมาย X ลงบนตัวเลขที่ท่านเลือก

1. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดหรือไม่

   ..... (1) มี

   ..... (2) ไม่มี

2. ขณะนี้ท่านรู้สึกปวดมากเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

3. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดมากที่สุดเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

4. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดน้อยที่สุดเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

5. ใน 24 ชั่วโมงที่ผ่านมา ท่านมีความปวดโดยเฉลี่ยมากน้อยเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

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แบบสอบถามเกี่ยวกับความปวด (หลังผ่าตัดวันที่ 2)

กรุณาทำเครื่องหมาย X ลงบนตัวเลขที่ท่านเลือก

1. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดหรือไม่

   ..... (1) มี

   ..... (2) ไม่มี

2. ขณะนี้ท่านรู้สึกปวดมากเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

3. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดมากที่สุดเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

4. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดน้อยที่สุดเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

5. ใน 24 ชั่วโมงที่ผ่านมา ท่านมีความปวดโดยเฉลี่ยมากน้อยเพียงใด

   0 1 2 3 4 5 6 7 8 9 10

   ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

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แบบสอบถามเกี่ยวกับความปวด (หลังผ่าตัดวันที่ 3)

กรุณาทำเครื่องหมาย X ลงบนตัวเลขที่ท่านเลือก

1. ใน 24 ชั่วโมงที่ผ่านมา ท่านรู้สึกปวดหรือไม่

..... (1) มี

..... (2) ไม่มี

2. ขณะนี้ท่านรู้สึกปวดมากเพียงใด

0 1 2 3 4 5 6 7 8 9 10

ไม่ปวด ปวดปานกลาง ปวดมากที่สุด

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23. ถ้าไม่พึงพอใจในวิธีบรรเทาปวดที่ได้รับโปรดให้เหตุผลของความไม่พึงพอใจนั้น

.....

.....

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APPENDIX C

List of Experts Consulted on Validation of Instruments

1. Assoc. Prof. Pensri Rabieb
   President of corporation of Center for Continuing Nursing Education

2. Assoc. Prof. Sompan Hinjiranan
   Vice-President of Christian University

3. Dr. Staporn Leelanuntakit
   Consultant of National Cancer Institute of Thailand

4. Miss. Navaporn Lohachareonvanich
   Head nurse of Gynecological ward, Ramathibodi Hospital

5. Mrs. Suteera Chukkul Luengsukchareon
   Nurse of Gynecological ward, Ramathibodi Hospital

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BIOGRAPHY

NAME	Miss Kwanjit Punpho
DATE OF BIRTH	7 March 1976
PLACE OF BIRTH	Nakornratchasima, Thailand
INSTITUTIONS ATTENDED	Mahidol University, Faculty of Medicine Rhamathibodi Hospital Bachelor of Nursing, 1999
	Mahidol University, Faculty of Medicine Rhamathibodi Hospital, 2007 Master of Nursing Science (Adult Nursing)
POSITION & OFFICE	Lecturer of Department of Adult and Elderly Nursing, School of Nursing, Rangsit University

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