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Non-Pharmacological Therapies in Pain Management

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1. Introduction

Pain is an unpleasant feeling and emotional experience that is related to real or potential tissue damage or a damage that is defined similarly. Pain is mostly subjective (Merskey, Bogduk 1986). From many points of view, the pain is a common symptom intended for seeking aid (Dickens et al. 2002). International Association for the Study of Pain (IASP) defines the pain as “an unpleasant emotional situation which is originating from a certain area, which is dependant or non-dependant on tissue damage and which is related to the past experience of the person in question” (Merskey, IASP 1986).

Although there is an increase of knowledge and developments in technological resources regarding the pain, many patients still experience pain (Nash et al. 1999). This situation causes for reduction in living quality and functional situation of the patients, increase in the fatigue levels (Kim et al. 2004) and impairments in daily life activities in working capacity and social interactions (McMillan et al., 2000; Allard et al., 2001). Also this situation will cause loss of workforce and will affect not only the patients but also his/her family members in economical terms thus causing undesired problems in psychological and social well being status (Uçan and Ovayolu 2007). All of these elements have directed both the patients and caregivers to seek for different searches in pain management (Evans and Rosner, 2005). For this reason in addition to the pharmacological treatment options for pain management, today, non-pharmacological treatment options and complementary medical attempts have started to be used (Kwekkeboom et al., 2003; Menefee and Monti, 2005). It is stated that such kind of therapies can be useful in pain management (Uçan and Ovayolu 2007). In a study conducted with the participation of 31.044 adults in United States, Barnes et al. (2004) determined that the usage rate of the complementary methods for the last year has been 36% and back pain and lumbago come first with 16.8% and neck pain comes third with 6.6% in terms of usage reasons of the complementary methods . Sherman et al. (2004) have stated that 24% of the patients with chronic lumbago used massage therapy.

2. Non-pharmacological therapies in pain management

It is considered that these therapies help the standard pharmacological treatment in pain management. While medical drugs are being used for treating the somatic (physiological and emotional) dimension of the pain non-pharmacological therapies aim to treat the affective, cognitive, behavioral and socio-cultural dimensions of the pain (Yavuz 2006).

These therapies can treat the pain as adjuvant or complementary at middle level and severe pain experiences as an adjuvant or complementary treatment. (Delaune & Ladner 2002).

Non-pharmacological methods,

- Increase the individual control feeling.
- Decrease the feeling of weakness.
- Improves the activity level and functional capacity.
- Reduces stress and anxiety.
- Reduces the pain behavior and focused pain level.
- Reduces the needed dosage of analgesic drugs thus decreasing the side effects of the treatment (Yıldırım 2006).

Non-pharmacological methods used in pain management can be classified in different ways. In general; they are stated as physical, cognitive, behavioral and other complementary methods or as invasive or -non-invasive methods. Meditation, progressive relaxation, dreaming, rhythmic respiration, biofeedback, therapeutic touching, transcutaneous electrical nerve stimulation (TENS), hypnosis, musical therapy, acupressure and cold-hot treatments are non-invasive methods (Black & Matassarini Jacobs, 1997). The most famous and common method among the invasive methods is acupuncture (Menifee and Monti, 2005). It is considered that these methods control the gates that are vehicles for pain to be transmitted to the brain and affect pain transmission or the release of natural opioids of the body such as endorphin (Black & Matassarini Jacobs, 1997; Menifee & Monti, 2005; Uçan & Ovayolu 2007).

Non-pharmacological methods used in pain management have been examined below in three groups such as peripheral therapies (physical agents/skin stimulation methods), cognitive-behavioral therapies and other therapies. Some of these methods require special training (Turan et al. 2010).

2.1 Peripheral therapies (physical agents/skin stimulation)

Skin stimulation that provides analgesia is defined as stimulating the patient's skin in a harmless manner to treat the pain (Yıldırım 2006). Skin stimulation attempts (physical therapies) can be classified as hot-cold treatments, exercise, positioning, movement restriction-resting, acupuncture, hydrotherapy, TENS, massage and therapeutic touch. If used in an appropriate manner these methods are effective on secondary pathologies such as inflammation, edema, progressive tissue damage, muscle spasm and function loss which takes part in acute pain. (Yıldırım 2006).

2.1.1 TENS (Transcutaneous Electrical Nerve Stimulation)

TENS has been defined by the American Physical Therapy Association as applying electrical stimulation to the skin to manage the pain (Sluka & Walsh 2003). Usually, it may be used in addition or instead of pharmacological agents to manage acute, chronic and post-operative pain. It is an electro-analgesia method (Mucuk and Başer, 2009). That is to say, thick and rapid transmitting nerve fibers are stimulated artificially with TENS and the pain transmission is tried to be stopped or reduced. TENS, which functions in that way, has an effect to reduce the narcotic drugs usage and pain level (Arslan & Çelebioğlu; Chen et al. 1998). TENS has various mechanisms of action regarding pain. Gate Control Theory is a theory used to define how TENS affects the pain perception which also has a part in improving TENS. Gate control theory regarding pain management is very commonly used by TENS in defining the process to

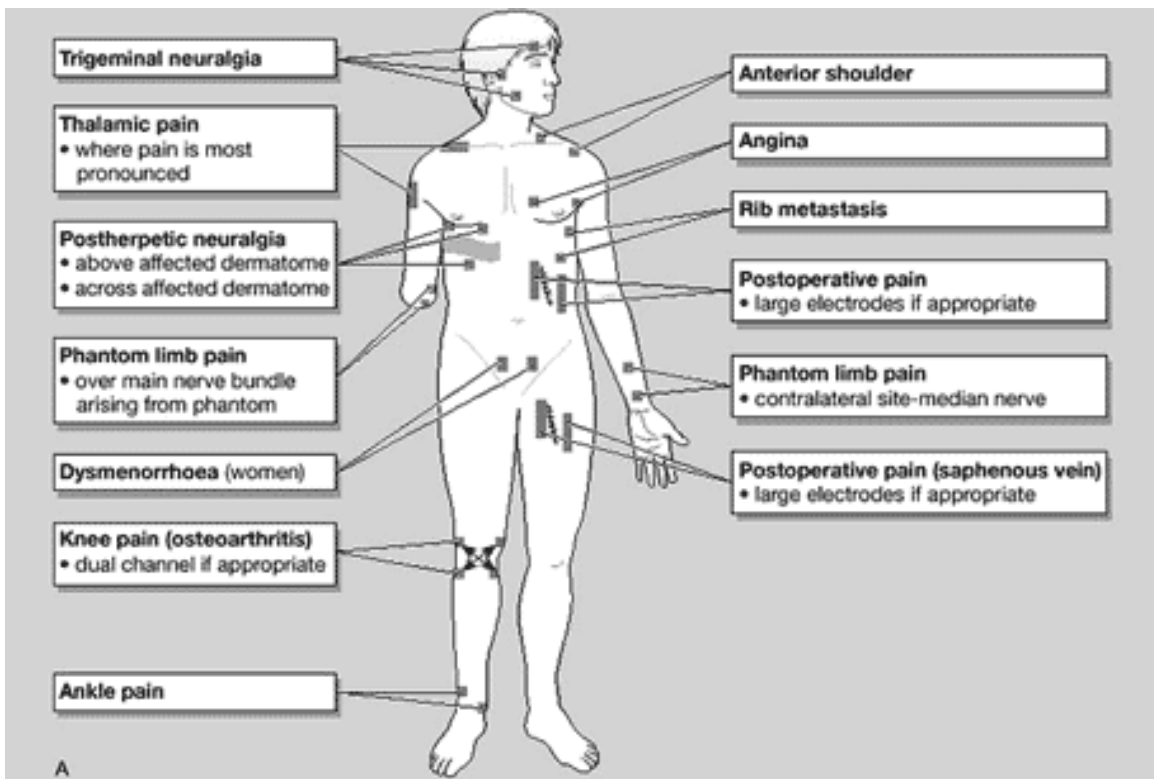


Fig. 1. a) <http://www.ib3health.com/products/TensandEMS/Literature/ApplicationChart.shtml> June/2011

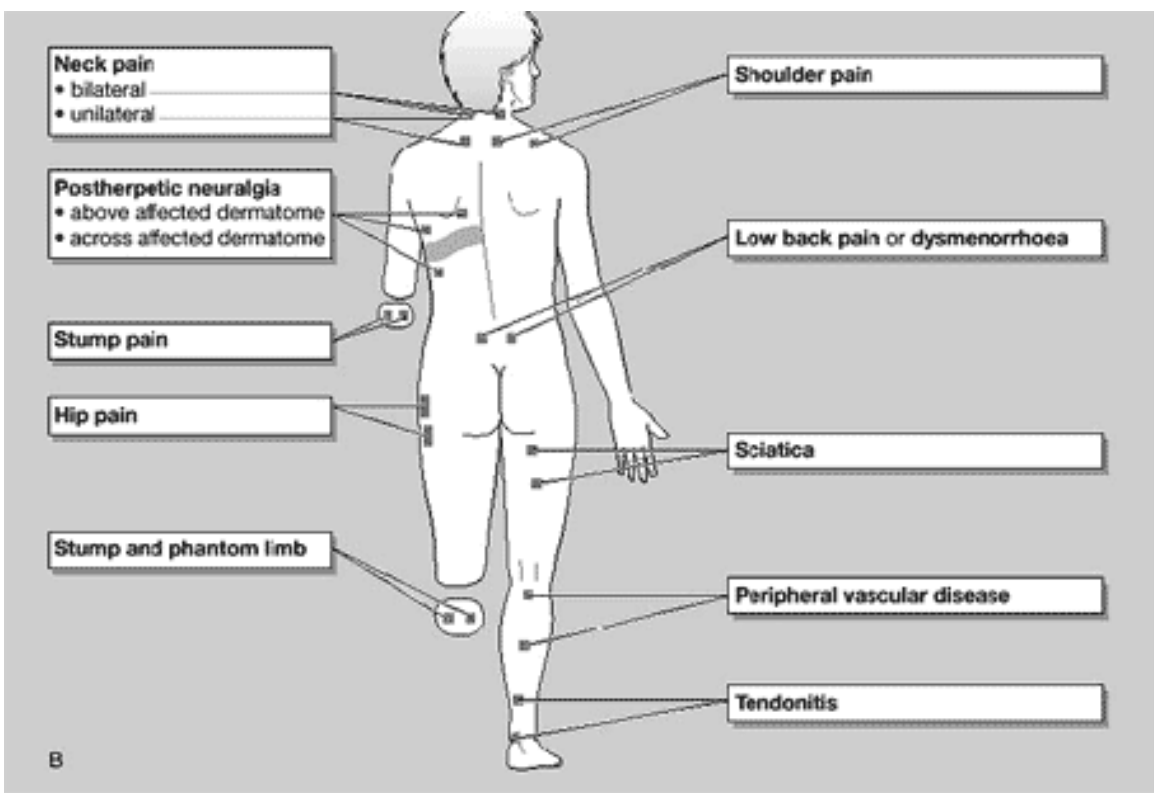
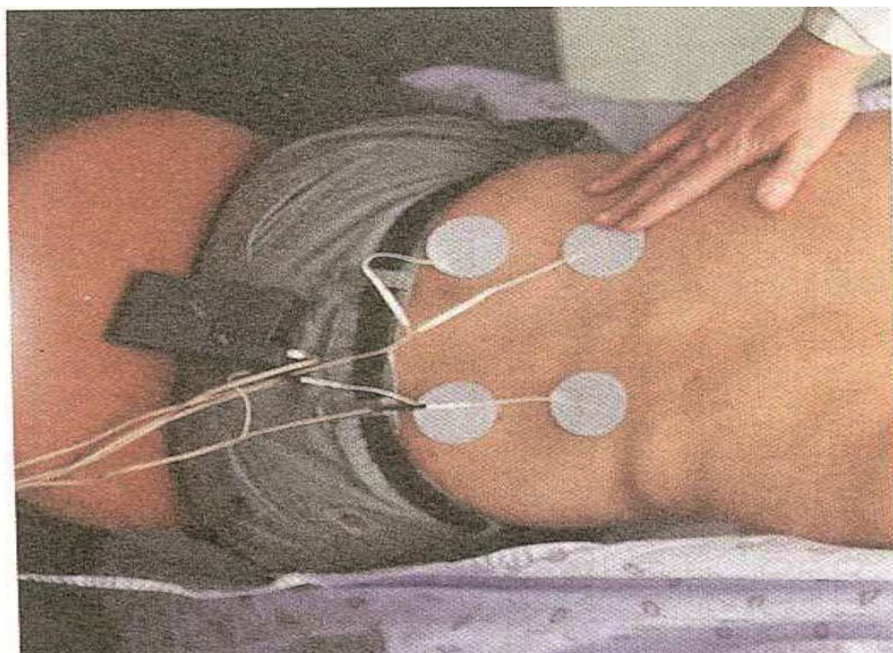


Fig. 1. b) <http://www.ib3health.com/products/TensandEMS/Literature/ApplicationChart.shtml> June/2011

prevent the pain (Sluka & Walsh 2003; Johnson 2002). In a study that has been conducted, it has been determined that the placebo group experienced 2-4 times less pain when TENS is used with pharmacological methods in post-operative pain management (Rakel & Frantz 2003), and in another study it has been determined that TENS usage in post-operative pain management has helped reducing the pain level and dosage of using analgesics (Bjordal et al. 2003). In addition to that, in some other studies it has been determined that first phase of labor in TENS group has been shorter and TENS treatment has been effective in relieving the pain (Kaplan et al. 1998; Simkin and Bolding 2004).

Points to Take into Consideration While Using Tens:

- TENS device should be used under the control of a health personnel.
- TENS devices should be used with caution in the areas where the pain could not be defined exactly.
- Device should be turned off while placing the materials.
- Electrical stimulation should not be used in front parts of the neck.
- You should use the device after controlling machine or motor vehicle producing TENS.
- This device should not be used on metal prostheses or monitors.
- TENS should be kept at places where the children cannot reach.
- People who are using cardiac pacemaker should consult to their doctors about whether TENS usage will be harmful for them or not.
- Electronic materials such as ECG monitors and ECG alarms may not work in full capacity while using TENS.
- It can cause damages on skin. That can be prevented by changing the type of gel and electrodes that are used.
- There are not reliable study results describing TENS usage during pregnancy (Yavuz 2006).



Dewit, S.C., (2009), *Fundamental concepts and skills for nursing*, 3rd Edition, W.B. Saunders Comp. Philadelphia, p.603-614.

Fig. 2. TENS Usage

2.1.2 Hot-cold treatment

Hot treatment moves the reflex arcs that inhibit the pain by means of heat receptors and reduces pain by vasodilatation effect. It is cheap and easy to use and it has a minimum amount of side effects when used regularly. It can be applied deeply or on surfaces. Application to the surface includes hot compresses, warm baths and paraffine usage. Deep applications such as ultrasound may increase the temperature of the tissues which are three to five centimeter deep (Arslan & Çelebioğlu, 2004).

On the other hand, cold treatment consists of applying a cooling material or device on any part of the body. Cold treatment which is a simple and cheap treatment method has an important place in non-drug therapies for pain management (Yavuz, 2006). Cold gel packages and ice packages commonly used in the application should be used by placing a tin towel/gauze between the skin and the package for being able to withstand extreme cold feeling during the first contact of the package, for having a homogenous cooling and providing hygiene. Cold treatment may be done for 15-30 minutes averagely until the anesthesia is felt on the area of application. The cold ice packs should be applied for at least 20 minutes. As a matter of fact, the affect of cold treatment on the human skin reveals itself in 4 stages. The patient will feel the cold within 1 to 3 minutes after the application, then feel a burning and pain sensation within 2 to 7 minutes and the pain and lethargy will decrease within 5 to 12 minutes, a breaking occurs for the pain-spasm vicious-circle and transmission of the nerve fibers in the area will decrease. An increase will occur for the metabolism within 12 to 15 minutes after cold treatment and a reflex vasodilatation occurs on the deep tissue. Thus, the edema and the pain will reduce and the tissue will be nourished with vasodilatation that will develop 15 minutes later (Karagözlüoğlu, 2001). Results of the studies made in the area have shown that the cold treatment has increased the pain threshold (Koç et al. 2006; Raynor et al. 2005; Sarifakioğlu & Sarifakioğlu 2004). So, the cold treatments that are applied locally are used to reduce the edema and treat the pain by taking the inflammation process under control (Saeki 2002; Sarifakioğlu & Sarifakioğlu 2004; Van der Westhuijzen et al. 2005).

It has been stated that cold treatment over the area where surgical sutures are found after lumbar disc surgery reduces both the pain during first 24 hours and the need for morphine (Brandner et al. 1996). Also, it has been shown that fluoromethane spray applications are a cheap method that are rapidly effective in managing the injection pain due to vaccination (Mawhorter et al. 2004) and cold package and ice applications have reduced the pain due to heparin injections (Kuzu ve Uçar 2001; Ross and Soltes 1995). In the study that they conducted, Demir and Khorshid (2010) have stated that cold treatment that is applied to the skin around the chest tube reduced the severity of the pain that is felt due to exclusion of chest tube and it has extended the time between exclusion of chest tube and taking an analgesic. It is stated that cold treatment is contraindicated for the situations such as urticaria/hypersensitivity, hypertension, Reynaud's phenomenon and sickle cell anemia which are related to cold (Mucuk & Başer, 2009).

2.1.3 Acupuncture and acupressure

Acupuncture which is one of the important components of traditional Chinese medicine has become a largely complementary in the West together with the conventional medicine. Acupuncture is accepted as a scientific treatment method that provides the body to restore its balance by means of stimulating some special points on the body with needles (Taşçı & Sevil 2007). Mechanism of action for the acupuncture could not be completely understood

until now. Effect of the acupunctures is tried to be explained by Gate Control Theory. According to this theory, effect of a sensory stimulant (for example lumbago) can be suppressed with another stimulant (picking a needle) within a neural system. Another theory that explains the effect of acupuncture is Raising Pain Threshold Theory. That is a theory in which inhibitor effect of acupuncture is defined. In this theory, it is predicted to stimulate the analgesia mechanisms of the body by causing various pains on the area where an individual is feeling the pain to be treated. In addition to these, it has also been evidence that the acupuncture stimulates the production of endorphin, serotonin and acetyl choline within the central nerve system (Van Tulder et al. 2005). It has been shown in the studies that have been conducted that the acupuncture had positive effects on post-traumatic somatic pain, patella-femoral pain, rheumatoid arthritis and idiopathic head pain. (Snyder & Wieland 2003). It is stated in the literature that the acupuncture is especially useful in treating the lumbago but it is underlined that the patients should be informed in terms of increasing or carrying on the activities (Öztekın, 2005). Although there are some strong evidences showing the benefit of acupuncture in acute pain, the evidence regarding the cancer pain is limited (Black & Matassarın Jacobs, 1997; Filshie & Thompson 2004; Menefee & Monti, 2005). In spite of that, Alimi et al. (2003) stated that the acupuncture applied to cancer patient has decreased the pain level.

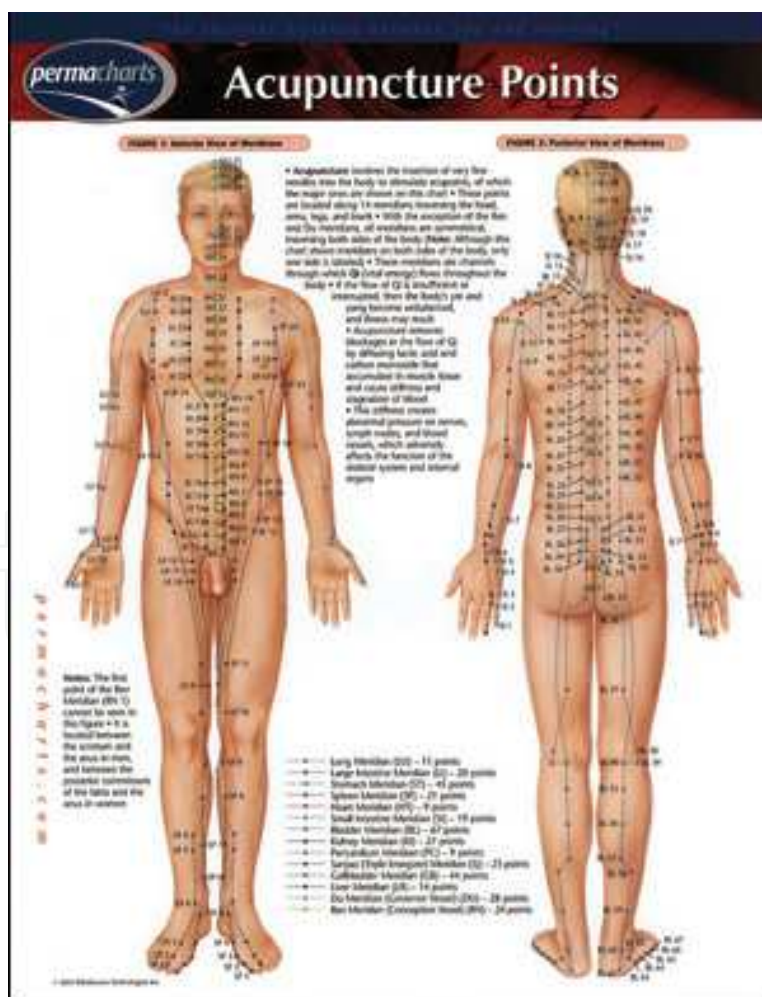


Fig. 3. <http://suphecimelek.wordpress.com/2010/10/31/akupunktur> June/2011

Acupressure is one of the traditional Chinese medicine approaches used for pain relief, diseases and injuries. Acupressure is a therapy that is conducted by applying physical pressure on various points on body surface by means of energy circulation and balance in cases of pain symptoms. This therapy is similar to the acupuncture and it is conducted by applying pressure on selected points of the body by fingers, hands, palms, wrists and knees in order to provide internal flow of energy. Acupressure technique is a noninvasive, safe and effective application (Hakverdioğlu, & Türk, 2006). It is suggested that acupressure reduces back, head, osteoarthritis, musculoskeletal and neck pains, pre-operative and post-operative pains, nausea-vomiting and sleeping problems (Tsay, Rong and Lin 2003; Tsay & Chen 2003; Hakverdioğlu, & Türk 2006).

2.1.4 Exercise

Exercise includes active-passive movements, bed movements and ambulation. Exercise increases the movement and provides continuity thus increasing the blood flow, preventing spasm and contractures of the muscles and relieving the pain (Musclow et al., 2002).

2.1.5 Positioning

It is applied to help or support the patient. This application can be supported by pillows, special beds and weight lifting. Position changes, which prevent the subsequent development of pain and reducing the acute pain, also increase the blood flow and prevent muscle contraction and spasms (Akdağ & Ovayolu, 2008). Positioning has been determined as the most common post-operative non-pharmacological method (Carroll 1999).

2.1.6 Restriction of movement /resting

These are applied for the patients who need certain bed rest and which are in traction. However, it should not be used alone for pain management. It can be used for fractures and back surgeries. Restriction of movement can also decrease edema development (Arslan & Çelebioğlu, 2004).

2.1.7 Massage

Massage is a manipulation applied on the soft tissue with various techniques (such as friction, percussion, vibration and tapotement) for recovery and supporting health. It is thought that the massage relieve the mind and muscles and increase the pain threshold (Karagöz 2006). Peripheral receptors on the body are stimulated with massage and stimulants reach the brain by means of spinal cord. In addition to pleasant feeling, a general relief is provided here (Turan et al. 2010). It is underlined that especially therapeutic massage is effective on chronic lumbago and that effect is stated to be a short term effect (Hsieh et al. 2004). Melancon and Miller (2005) draw attention to the fact that pain management in patient groups with lumbago that are treated with massage and pharmacological therapies are similar and they recommend the sue of massage as an alternative treatment option for the patients with lumbago within the framework of a integrated care. Nixon et al (1997) has stated that massage played a role in reducing the pain. In addition to that it is determined in some randomized controlled studies that massage made during labor decreases pain and anxiety; it also improves the general well being and progression of birth process and less reaction is given to the pain (Caton et.al 2002; Simkin & O'Hora 2002).

2.1.8 Hydrotherapy (Balneotherapy)

Using water for treatment by means of thermal springs, potable water resources and other methods is defined as "hydrotherapy" while using the water for therapy by means of temperature effect is defined as "hydrothermal treatment". Effect of hydrotherapy is related to its mechanical or thermal effect. Hot application stimulates the immune system, provides hormones that are suppressing the stress to be released, stimulates the circulation and digestion systems, increases the blood flow and provides muscle relaxation thus reducing the sensitivity developed against the pain (Karagöz, 2006). It is stated in the literature that hydrotherapy is effective while treating back and chronic lumbago (Balogh et al. 2005; Hartel & Volger 2004).

2.2 Cognitive-behavioral therapies

Cognitive-behavioral therapies are a part of multimodal approach in pain management. These attempts affect not only the pain level but also helps the patients to establish a management feeling of themselves while dealing with pain and develop management behaviors and improved self-esteem. Cognitive-behavioral therapies can generally be applied by all members of the pain team. Most of the special techniques can be learned and applied by doctors, nurses, social service specialists and psychologists (Yıldırım 2006). These therapies should be thought and applied as early as possible before the patient experiences pain (Delaune & Ladner 2002).

2.2.1 Relaxation - respiration techniques and dreaming

Relaxation techniques cause an increase in slow brain waves in EEG by decreasing oxygen consumption, blood pressure, respiration amount and the number of pulse. Therefore, it is stated that the sensitivity developed against the pain should be prevented by means of these techniques (Karagöz, 2006).

Techniques used in providing the spiritual and physical relaxation are summarized below:

- *Respiration providing the relaxation:* It is provided to focus on the respiration and avoid disturbing thoughts by taking a deep breath slowly through the nose and giving it back in a long time through the mouth. These techniques can be applied for 5-10 minutes per day (Nordin 2002).
- *Advanced muscle relaxation treatment:* It is aimed to relax the unwanted contractions by determining them through making the patient contract and relax certain muscle groups on his body (Nordin 2002).
- *Dreaming:* After relaxation is provided, the patient is made to focus on a stimulant that makes the patient happy (light, color, sound, pattern etc.) in order to get the patient far away from his pain for a short period of time (Karagöz 2006). In a study made by Lewandowski et al (2005) it has been stated that an effective pain management can be obtained by directing the patients to dreaming for more than 4 days.

2.2.2 Distraction

Getting the attention away from the pain reduces its severity. The aim in using that technique is to increase the tolerance for pain and decrease the sensitivity for pain. This method includes listening to music, watching television, reading books and dreaming (Arslan & Çelebioğlu, 2004). There are some sources which supports that distraction is a method used in decreasing the pain (Seers & Carroll 1998; Petry 2002).

2.2.3 Praying

Most of the individuals with chronic pains use the praying method. It is indicated that praying has positive results for decreasing the body pain in old people and relieving their physical functional disorders and it is suggested to use the praying method in order to reduce the depression and anxiety that is caused by chronic pain (Meisenhelder & Chandler, 2000; Karagöz, 2006).

2.2.4 Meditation

In the traditional meaning, meditation is generally focusing on the moment. Meditation; can also be defined as focusing on the present. This act is realized with an individual focusing on his own respiration, a word or picture. Duration of the meditation can last from a few minutes to 30 minutes or take more (Snyder & Wieland, 2003; Gray, 2004). Considering the fact that meditation helps relaxation, it is thought to be effective in relieving the pain (Gray, 2004). Carson et al (2005) have stated that an 8-week meditation is useful for relieving the pain for patients with chronic lumbago.

2.2.5 Yoga

Yoga is providing relaxation by using respiration exercises and meditation with slow movements. It is considered that it can be useful against musculoskeletal pain in terms of using physical stretching moves and increasing strength (Dillard & Knapp, 2005). Individuals that use yoga have stated that they believe in the benefit of this method and it is a cost-effective method. It is stated in a study that applying yoga for 16 weeks has cured the chronic lumbago (Williams et al. 2005). Also, in a study conducted by Williams et al (2005) it has been stated that functional insufficiency experienced with chronic lumbago and use of pain killers have been reduced by means of yoga.

2.2.6 Hypnosis

Hypnosis; it is the state of conscious change similar to sleep. Hypnosis requires the body to relax and the patient to focus on an object, a stimulant or memory. Hypnosis is *“the deep physical relaxation state during which subconscious can be reached and important abilities are suspended”*. In this state, ability of people to be dominated increases (Taşçı & Sevil, 2007). Besides mechanism of action of hypnosis over the pain is not known exactly and it is mentioned that the pain is reduced with some physiological changes that occur as a result of hypnosis. Hypnosis has been used in a positive manner in terms of cancer pain, pains in head-neck region and phantom pain which is the sensations felt by amputees (Black & Matassarini Jacobs, 1997). Jensens and Patterson (2006) has stated that hypnotherapy/hypnosis is used for analgesia in various types of chronic pains and it has been stated that hypnosis has been effective for neck pain. Also Lioffi et al (2006) has made a study with pediatric cancer patients in which it has been determined that hypnosis application has decreased pain and anxiety level in patients (Lioffi et al. 2006).

2.2.7 Bio-feedback

Biological feedback is based informing the patient in order to help relaxation or control a physiological function. For example, in cases of tension type headache, it is provided for the electrical activity received by means of head muscles and facial muscles to be perceived as colors or sounds by the patient. Thus, observing the color changes or decreases in the sound,

the patient understands whether the relaxation occurred or not (Uçan & Ovayolu 2007). Bio-feedback is used for treatment in the cases of pain, migraine pain, spinal cord injuries and movement disorders. It is aimed to control of physiological reactions such as muscle tension, body temperature, heart rate, brain wave activity and other vital parameters. Efficiency of the treatment depends on the desire that a patient shows for learning of how controlling of these functions and participation of patient in the process. Biofeedback appliers train the patient in terms of mental and physical exercises, visualization and deep breaths (Eidelson, 2005). In many types of chronic pain the bio-feedback has been shown to be effective (Moseikin 2003; Teyhen et al. 2005).

2.2.8 Behavioral therapy

Aim of this therapy is to increase the functional level of the patient decrease the maladaptive behaviors and firstly reduce and then completely stop painkiller usage. The family is trained by the treatment team; description of pain (grimacing, moaning, and remaining motionless) is avoided and well-adaptive behaviors such as physical activities are reinforced (Brietbart et al. 2004).

2.3 Other non-pharmacological therapies

2.3.1 Reflexology

Reflexology is a technique that is based on the principle that suggests there are reflex points on our feet corresponding to all parts of our bodies, all organs and systems and these points are the mirrors of the body anatomy. Pressure applied to these reflex points by special hand and finger techniques provides the stress to be relieved and cause physiological changes and a reduction in pain perception (Yıldırım, Fadiloğlu and Uyar, 2006). There are totally five pressurizing techniques to make massage on reflex areas: Thumb move, finger move, rubbing move, patting move and compressing move. These moves are applied to ears, hands and feet similarly. The important thing here is to know how this technique will be applied to whom. Physical structure of an individual, age and current health status are taken into consideration. Treatment consists of applying pressure with the side of a thumb or other fingers and turning it clockwise. This pressure is generally deep but it does not have to be painful. A good reflexologist prefers repetition of short and painless seances to a single but painful seances for the whole disease. Intensity of the pressure can be low at the beginning and increased as the treatment progresses. Each seance takes from 10 minutes to 30 minutes and it is decided according to the situation of the person how many seance will be necessary (Stephenson et al. 2000; Bolsoy 2008).

It is stated in the literature that reflexology is used especially for reducing migraine pain, back pain, muscle pain, end stage cancer pain and side effects of chemotherapy and to increase living quality (Long et al. 2001; McNeill et al. 2006; Mollart 2003; Quattrin et al.2006; Wringht et al.2002) In spite of that, it is stated that it is unfavorable to use reflexology in acute infections and fever situation, deep venous thrombosis, surgical situations and in cases of open scars, malign melanoma and during first trimester of the pregnancy or with the patients that has miscarriage or premature birth risks (Long et al. 2001; Lett 2002).

2.3.2 Herbal treatments

Herbal medicine is using the chemical materials obtained from inside, root, leave, seed and flower parts of the herbs for treatment (Karagöz 2006). Today, most individuals use herbal

products in addition to their medical treatments with drugs without consulting to any professional (Turan et al. 2010 ; Deng et al. 2005). It is stated in the literature that herbal medicine has been commonly used to treat lumbago and back pains (Gray, 2004; Gagnier et al. 2006; Hartel & Volger 2004).

2.3.3 Aromatherapy

Aromatherapy is using the essential oils that are obtained from flowers, herbs and trees to improve health and well being. These oils are applied by being respired through oily gauze that is placed under the nostrils of the patient or as massage oils being applied on skin. It has been evidenced that the aroma oils reached the lymph system by means of blood circulation and provided recovery by means of intercellular fluids (Turan et al. 2010). It is thought that aromatherapy may be able to help reducing stress, treating cold, sniffles, skin and menstruation problems and relieving pain (Karagöz, 2006; Jennings, 2004; Yıldırım et al. 2006; Deng et al. 2005). It is known that lavender oil is used in treating migraine pain, osteoarthritis, rheumatoid arthritis and lumbago. It is also known that eucalyptus, black pepper, ginger, daisy, licorice, rosemary and myrrh oils are used in relieving pain. But it is stated that lavender oil can cause hypersomnia and using licorice for long time can cause hypertension (Delaune & Ladner 2002). Although the usage of aromatherapy within health system increases day by day it is seen that the researches in this meaning is quite insufficient. Data regarding the efficiency of essential oils depend only on individual experiences. For this reason, it is necessary to conduct studies with large samples and high level of evidence to determine the efficiency of essential oils in pain management (Snyder & Wieland 2003; Tseng 2005)

2.3.4 Chiropractics

Chiropractics is the neck-pulling movement used in treatment of the disorders in connective tissues and musculoskeletal system which consists of muscles, joints, bones, tendon, cartilage and ligaments. The main principle of this approach is the fact that to relieve the pain and to improve health with the applications made on spine and joints which have had a positive effect on neural system and natural defense mechanisms (Gray, 2004). Chiropractics have focused on the connection between body structure and the functions of the neural system and manipulation of bones and joints to regain the health. It is known that the application that is taken, decreases the amount of burden on the neck and relieves the pain. However, the individuals who have serious disorders such as severe cervical disc hernia, complaints due to rheumatoid arthritis , tumors and infection have to avoid from these applications (Turan et al. 2010; Karagöz 2006; Deng et al. 2005).

2.3.5 Musical therapy

Many studies that have been conducted have shown that the music had positive effects on pain and anxiety and increased the living quality of the patient or healthy individuals. Music reduces heart rate, blood pressure, body temperature and respiration rate and it distracts the attention of the patient to another point thus reducing the pain perception and reducing especially the nausea due to chemotherapy so that increasing living quality of patients in terminal period of cancer (Chase, 2003; Hilliard, 2003; Deng et al. 2005; Stefano et al. 2004, Uçan & Ovayolu 2007). In a study that states listening to music stimulates the alpha waves of brain which have been determined as a stimulator for the release of endorphin and

creates a relaxation state and therefore music has played a role not only in relieving the pain but also decreasing blood pressure, heartbeat rate and other physiological responses (Henry, 1995). A point to be taken into consideration here is to let the music type to be preferred by the patient (Delaune & Ladner, 2002). New studies show that slow music creates a relaxing effect. According to the literature musical therapy should not be used continuously to be an effective method. Applying musical therapy form 25 to 90 minutes per day will provide sufficient treatment period.

Attempt	Advantage	Disadvantage
Relaxation Bio-feedback Distraction	<ul style="list-style-type: none"> • It may reduce the pain and anxiety without having drug-related side effects. • It can be used more likely as an adjuvant therapy together with other methods. It may increase the management feeling of the patient. • Most of them are not expensive, they do not require special equipment and they are easily applicable. 	<ul style="list-style-type: none"> • The patients should be aware of using the management strategies by themselves. • An appropriate time zone is needed to teach the attempts.
Psychotherapy, Hypnosis	<ul style="list-style-type: none"> • It may reduce the pain and anxiety of the patients who have pains that are relatively difficult to manage. • It may increase the number of methods that the patient uses to manage. 	<ul style="list-style-type: none"> • It requires an experienced therapist.
Skin Stimulation/Cutaneous Stimulation (superficial hot-cold application and massage)	<ul style="list-style-type: none"> • It may reduce muscle spasms, inflammation and pain. • It can be used more likely as an adjuvant therapy together with other methods. • It may increase the controlling ability of pain feeling of the patient. • It is so easy to use. • It may be applied by the patients or families. • It is a cheap method. 	<ul style="list-style-type: none"> • Hot application can increase the bleeding or edema after acute injuries. • Cold application is contraindicate for the situations such as urticaria/hypersensitivity, hypertension, Reynaud's phenomenon and sickle cell anemia which are related to cold.
Transcutaneous Electrical Nerve Stimulation (TENS)	<ul style="list-style-type: none"> • It reduces the pain without having any drug-related side effects. • It can be used more likely as an adjuvant therapy together with other methods. • It gives the feeling of pain management to the patient. 	<ul style="list-style-type: none"> • It requires an experienced therapist. • There is a risk for bleeding and infection. • There are no reliable results for use in cases of pregnant women.
Aromatherapy	<ul style="list-style-type: none"> • It has an analgesic effect. • It has a sedative and relaxing effect. 	<ul style="list-style-type: none"> • It may cause hypersomnia. • Some herbs should not be used with other anti-depressants and alcohol.
Acupuncture	<ul style="list-style-type: none"> • It may provide pain reduction without any side effects. • It can be used more likely as an adjuvant therapy together with other methods. 	<ul style="list-style-type: none"> • It requires an experienced therapist.

Table 1. Advantages and Disadvantages of Some Non-pharmacological Methods

In a study they conducted, Nilsson et al (2003) have stated that listening to music for one hour in early post-operative period may reduce post-operative pain and morphine consumption of the patients. In a study conducted by Sahler and Hunter (2003) with the patients who had bone marrow transplantation, the patients were made to listen music which has a relaxing effect, at least twice a week for 45 minutes and it has been determined that the group which was not included to music therapy has a higher pain score when compared to the one that has received musical therapy. It has been stated that the musical also has positive effects during labor period. In a study that is conducted by Browning (2000) related to the mother's pain and anxiety levels to evaluate the effect of musical therapy applied to primipar mothers before delivery, the mothers have stated that the musical therapy relieves their pain and it made them feel themselves more comfortable and calm.

Advantages and disadvantages of some non-pharmacological methods used in pain management have been specified below (Table 1).

3. Conclusion

As a result, the pain can be managed in a more effective manner with the combination of pharmacological and non-pharmacological therapies. Developments in pain management may provide different opportunities to the patients and their families thus providing the patients to carry on a more comfortable and productive life. Both health personnel and caregivers need to have important responsibilities while following these developments. For an effective care to be provided to patients, developments regarding pain management and updated pharmacological and non-pharmacological approaches regarding pain management and pain should be followed. Also these techniques may help reducing pain and it must be encouraged as a part of the comprehensive pain management efforts. For this reason, abilities and preferences of the patient regarding the use of non-pharmacological methods should be taken into consideration; it should be underlined for the patients that these are used together with medical and pharmacological treatments and the use of non-pharmacological methods should be included to the care plan when patient is appropriate and willing. From this point of view, it is recommended to use various non-pharmacological methods for pain management but we need more study results that support the efficiency of these methods. For this reason, it will provide the evidence-based results to be put forward if randomized controlled experimental studies, which examine the efficiency of these methods in taking the pain under control, are conducted.

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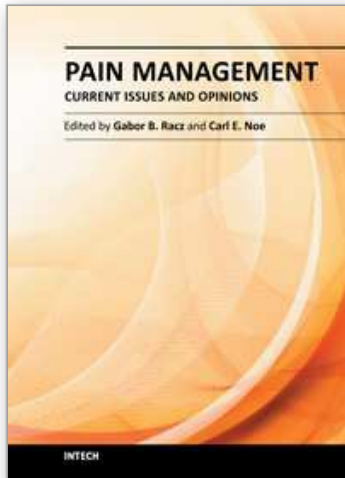
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