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THERAPEUTIC EFFECTS OF SAUNA YOGA IN PATIENTS
WITH CHRONIC PAIN

Degree Programme in Physiotherapy
2017

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Degree Programme in Physiotherapy

December 2017

Number of pages: 30

Appendices: 3

Keywords: chronic pain, sauna, Sauna Yoga, therapeutic exercise

The objective of this thesis was to identify effects of Sauna Yoga in patients with chronic pain, using sleep and enjoyment of life as specific measures. Chronic pain is a severe health issue within Western society, causing massive health costs annually. Understanding about pathophysiology underlying chronic pain has increased over the last decades, and growing evidence supports claims that in chronic pain, pain experience is widely affected also by biopsychosocial domains.

Sauna Yoga is an exercise method based on mindfulness and yoga. It consists of simple exercises, conducted in sauna settings in temperature of 50°. Sauna Yoga is a Finnish intervention, yet to be researched. Positive feedback from people who have taken part in Sauna Yoga has given an indication to conduct research about it, and to introduce it to new possible target groups.

This thesis was done in cooperation with Sauna Yoga instructors Elina Höckert and Erika Santala. Practical part of the thesis was conducted as a quantitative research. During a 6-week Sauna Yoga intervention period participants took part in instructed sessions once a week. Results showed mean values of the scores to be lower post-intervention, but however they are not statistically significant. This was because of the large deviation among individual scores, of which some were more negative post-intervention. Conclusion of the study was that Sauna Yoga can have a slight positive effect in what comes to improvement in sleep and enjoyment of life in patients with chronic pain. However, because of large variation in results it seems effects of Sauna Yoga are also highly individual. Because of the small sample size, more research needs to be conducted about Sauna Yoga to conclude whether or not its use as a form of therapeutic exercise is effective among people with chronic pain.

CONTENTS

1	INTRODUCTION	4
2	CHRONIC PAIN	5
2.1	Pain physiology	5
2.2	Modulation	6
2.3	Cortical representation and reorganization	7
2.4	Sensitization	7
3	BIOPSYCHOSOCIAL MODEL OF PAIN	8
3.1	Theoretical background	8
3.2	Research addressing biopsychosocial model	9
4	WELL-BEING	10
4.1	Sleep	10
4.2	Enjoyment of life	10
5	THERAPEUTIC EXERCISE	11
5.1	Yoga	12
5.2	Sauna Yoga	12
6	HEAT AND SAUNA	14
7	AIM AND OBJECTIVES OF THE THESIS	16
8	METHODOLOGY	16
8.1	Participants	17
8.2	Brief pain Inventory Short Form	17
8.3	Data collection	17
8.4	Background information form and diary	18
9	RESULTS	18
9.1	Effects of Sauna Yoga on sleep	19
9.2	Effects of Sauna Yoga on enjoyment of life	19
10	CONCLUSION	20
11	DISCUSSION	21
	REFERENCES	25
	APPENDICES	

1 INTRODUCTION

There is a high prevalence of pain among Finnish population. Nationwide research “Terveys 2000” concluded monthly prevalence of neck and shoulder pain to be 23-40%, and back pain 30-36% of the population. Examples of chronic pain conditions were chronic back pain syndrome with prevalence of 10-11%, and chronic neck pain with prevalence of 5,5-7,3% of population. Pain costs to society in part-time / early retirements, and in used sick leave days. Annual costs are hundreds of millions of euros. (Haanpää, Hagelberg, Hannonen, Liira & Pohjolainen n.d.)

International Association for the Study of Pain (IASP) defines pain as “a distressing experience associated with actual or potential tissue damage with sensory, emotional, cognitive, and social components” (Williams & Craig 2016). Pain can be classified according to its duration, frequency, cause, severity, or disabling consequences. According to duration, pain is acute when it has lasted less than 3-6 months, and considered chronic when it lasts longer than 3-6 months or after normal duration of tissue healing. Pain can be brief, intermittent, or continuous depending on its frequency. (Kalso, Haanpää & Vainio 2009, 106; Taylor 2006)

Probable causes for pain are classified as nociceptive, neuropathic, idiopathic/unknown, and psychogenic reasons. Different pain types can also get mixed and be present together. Nociceptive pain is defined as pain caused by an injury to the musculoskeletal system, whereas neuropathic pain is caused by damage to the somatosensory system. When mechanism of experienced pain is unknown, pain is considered idiopathic. Psychogenic pain is based solely on psychological factors, and rarely it is the only cause for pain. In formation of chronic pain however, psychological factors are often involved. (Arokoski, Mikkelsson, Pohjolainen & Viikari-Juntura 2015, 51; Cruccu et al. 2010; Haanpää, Hagelberg, Hannonen, Liira & Pohjolainen n.d.; Taylor 2006)

2 CHRONIC PAIN

Chronic musculoskeletal pain is defined as “persistent or recurrent pain that arises as part of a disease process directly affecting bone(s), joint(s), muscle(s), or related soft tissue(s)” (Treede et al. 2015). In Finland, chronic pain is a severe health issue affecting about one in every five people of working age. This causes major health costs for the society each year, which were 469 million euros in 2013. (National Action Plan for Treatment of Chronic Pain and Cancer Pain for 2017–2020, 2017)

2.1 Pain physiology

Nociception is an event which involves activation of nerve endings, which are specialized to sense tissue damage. Nociception and pain experience are separate terms which should not be mixed. Pain experience is more than nociception - it holds the subjective evaluation of the stimulus. (Haanpää, Hagelberg, Hannonen, Liira & Pohjolainen n.d.) In addition, suggestion is that pain is never solely result of nociceptive input and instead, it is always modulated to some extent by different factors. Furthermore, evidence has shown nociception to have little or nothing to do with pain experience, though in literature, amount of nociceptive input has often been presented as the direct source for pain. (Moseley & Vlaeyen 2015)

Nociception can be divided into four phases; transduction, transmission, modulation, and perception. First, nociceptor is activated by a stimulus which can either be chemical, mechanical, or thermal. Activation happens only if the stimulus is powerful enough to pass excitation threshold, which then causes a message, an action potential, to form. From the periphery action potential transmits onto the spinal cord where it can be modulated, and from there it is transmitted through ascending tracts onto the brain where brain forms its perception about the message. (Arokoski, Mikkelsen, Pohjolainen & Viikari-Juntura 2015, 51-52; Butler & Moseley 2006, 34, 72; Pergolizzi et al. 2013)

How nociceptive input is interpreted eventually depends on perception of the brain, and therefore stimulus itself is not necessarily equal to the amount of perceived pain (Arokoski, Mikkelsson, Pohjolainen & Viikari-Juntura 2015, 51-52). Instead, it is the brain which concludes if the body is under threat and whether or not it is relevant to protect the body by experiencing pain (Moseley & Butler 2017, 3). Pain experience is conscious, and response to the stimulus is based on evaluation of information from excitatory and inhibitory tracts, interpreted in brain's neural networks (Haanpää, Hagelberg, Hannonen, Liira & Pohjolainen n.d.). No specific pattern exists in what comes to activation of the brain in pain experience. What is known is that several parts of the brain are activated (Butler & Moseley 2006, 38-39), and that pain experience involves sensory-discriminative, cognitive-evaluative, and affective-motivational components (Treede, Kenshalo, Gracely & Jones 1998).

2.2 Modulation

As mentioned in previous chapter, nociceptive input in itself does not cause pain. When nociceptive stimulus transmits onto the spinal cord, it synapses with another neuron in dorsal horn of spinal cord. Neurotransmitters are released into the synapse, which can excite or inhibit and thus, modify the stimulus. Another system responsible for inhibition of pain is periaqueductal gray matter, also known as descending inhibitory pathway. (Bannister, Kucharczyk & Dickenson 2017; Kalso, Haanpää & Vainio 2009, 85-90; Ohara, Vit & Jasmin 2005)

Because of plasticity of the nervous system, responses to stimulus can permanently change. This depends on function of neurons and their activity within spinal cord. If prolonged, nociceptive stimulus can cause neurons to sensitize, falsifying the information carried onto to the brain. If changed responses to stimulus become permanent, it also affects to brain's interpretation of the information. (Moseley 2007)

2.3 Cortical representation and reorganization

In literature, cortical representation is defined as a map which represents motor and sensory areas of human body (Flor 2000). As mentioned on previous chapter, re-

sponses to stimulus can permanently change because of neural plasticity. This has been regarded to be a process of associative learning (Bannister, Kucharczyk & Dickenson 2017). Research evidence recognizes the possibility of cortical reorganization as part of the underlying pathology in chronic pain (Tsay, Allen, Proske & Giummarra 2015), and suggestion is that over time chronic pain causes enlargements to the representative cortical areas of the brain (Flor 2000). However, it is too early to say that cortical reorganization and pain have a cause and effect- relationship, since amount of credible evidence is limited so far (Tsay, Allen, Proske & Giummarra 2015).

2.4 Sensitization

Nervous system can become sensitized peripherally and/or centrally due to prolonged stimulus (Kalso, Haanpää & Vainio 2009, 80). Concepts of peripheral and central sensitization differ from each other in underlying molecular mechanisms and clinical presentation. Peripheral sensitization is part of the inflammatory reaction in acute nociceptive pain. To protect the damaged tissue, excitation threshold of neurons becomes lower, and thus nociceptive stimuli is amplified and more frequent. Area of peripheral sensitization is narrowed to the site of tissue injury, thus being also a protective mechanism ensuring that further damage does not happen. It is possible for peripheral sensitization to lead to central sensitization. (Bettini & Moore 2016; Borstad & Woeste 2015; Latremoliere & Woolf 2009; Pergolizzi et al. 2013)

Central sensitization is a state of hypersensitivity within the central nervous system (CNS). This phenomenon gives a pathological explanation to persistence of pain and presence of pain even when no evident cause exists, and it has been recognized to be a predisposing factor for chronic pain. Central sensitization results from neuroplastic changes in function of the CNS, and dysfunction of cortical inhibitory mechanisms. (Borstad & Woeste 2015) Whereas acute pain is a protective response of the body, pain resulting from central sensitization is not reliable anymore in the sense that there is no tissue damage even though there is pain. (Bettini & Moore 2016; Latremoliere & Woolf 2009) Abnormal responses caused by sensitization include allodynia – pain experience caused by stimulus which is not supposed to cause pain (for instance a

light touch), and secondary hyperalgesia – where sensitivity to experience pain is heightened and area where pain is experienced is enlarged. (Bettini & Moore 2016; Kalso, Haanpää & Vainio 2009, 80; Latremoliere & Woolf 2009)

3 BIOPSYCHOSOCIAL MODEL OF PAIN

Different theories and models exist and have been developed over the years in the quest for explaining pain. Combining factor for these models is that more or less each of them addresses cognitive, behavioral, and emotional factors as likely contributors of pain experience. (Taylor 2006) In chronic pain, primary pathology is often irreversible or unknown, and associated with secondary pathologies. Sensitized mechanisms of nervous system cause person to be more prone to pain, and associated secondary pathologies and their physical, psychological, and social components can further increase pain. (Booth, Moseley, Schiltenswolf, Cashin, Davies & Hübscher 2017) Common psychological domains associated with chronic pain are negative emotions, fear, attention on pain, and different beliefs about pain (Haanpää, Hagelberg, Hannonen, Liira & Pohjolainen n.d.).

3.1 Theoretical background

Biopsychosocial model of pain was introduced by George Engel in 1970s when he argued that the biomedical viewpoint, which suggests pain is equal to the amount of tissue damage, does not provide sufficient explanation about pain. Cases, where patients continued to experience pain and perceive themselves as sick though no underlying pathology could be found or it had already healed, were left unexplained. He concluded that perceived pain is not only dependent on physiological factors and thus, created the biopsychosocial model which addresses psychological and social factors that could possibly contribute to pain experience. (Engel 1977; Pergolizzi et al. 2013)

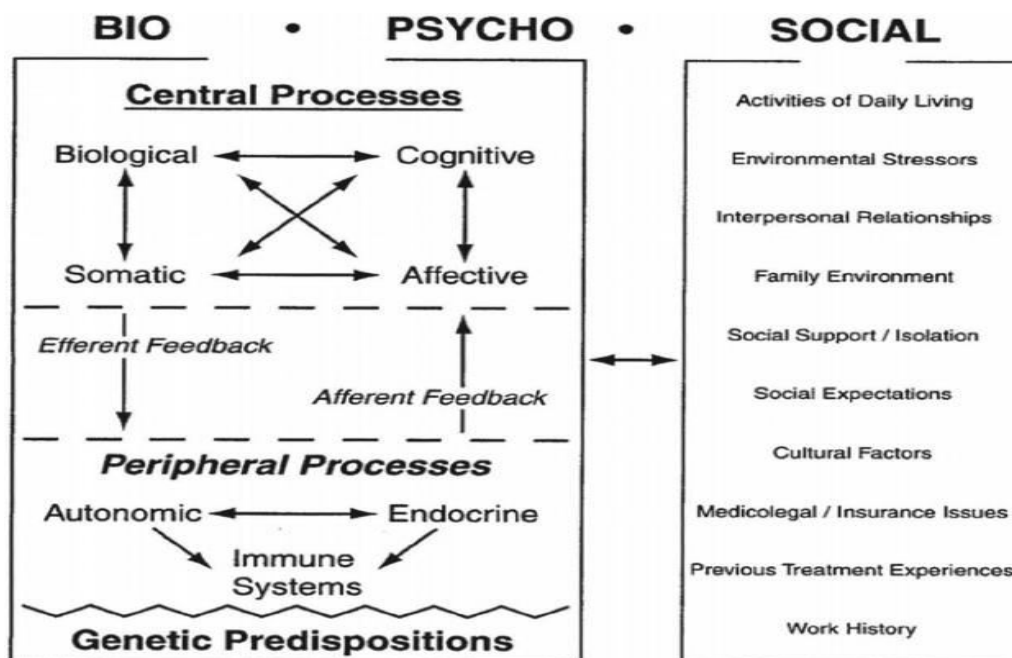


Figure 1. A conceptual model of the biopsychosocial interactive processes involved in health and illness (Gatchel 2004)

3.2 Research addressing biopsychosocial model

Chronic pain is often associated with secondary pathologies, such as pain catastrophizing and sensitization of nervous system, which increase disability and require use of other treatment methods besides exercise. (Booth, Moseley, Schiltenswolf, Cashin, Davies & Hübscher 2017) Psychological and social factors have been recognized as contributing factors in chronic pain experience and therefore, applying biopsychosocial model into treatment is widely approved. In addition, because of its thorough approach to pain, biopsychosocial model is recommended to be used in each patient assessment. (Amarins, van Wilgen, Meeus & Nijs 2016; Hruschak & Cochran 2017) However, among research there is still inconsistency regarding what kind of role psychological and psychosocial factors have on pain experience (Moseley 2007), and meaning of biopsychosocial factors has been stated as contradictory, though most likely they have an impact of some degree (Website of Käypä Hoito 2017).

4 WELL-BEING

As of yet, an exact definition for well-being has not been defined. However, it has been regarded as a dynamic and multidimensional construct, suggested to be a sum of person's physical, psychological and social resources which interact with physical, psychological, and social challenges. (Dodge, Daly, Huyton & Sanders 2012)

4.1 Sleep

Lack of sleep has been identified as a predisposing factor for several diseases and mortality (Itani, Jike, Watanabe & Kaneita 2016), and it is recognized that in chronic pain patients, pain and sleep have a relationship where both affect one another, creating a vicious cycle. Poor sleep has been studied to alter modulation of pain and to increase pain experience (Kelly, Blake, Power, O'Keeffe & Fullen 2011; Kundermann & Lautenbacher 2007), and therefore improvement in sleep is noted as an important tool concerning pain management (Brennan & Lieberman 2009).

In literature, sleep-related domains have seldom been a measure of well-being and therefore evidence about their relationship is limited. Existing studies indicate that with better quality and longer duration of sleep, wellbeing is also higher. (Howell, Digdon, Buro & Sheptycki 2008) Studies show chronic low back pain is often associated with variety of sleep disturbances, like difficulty in falling asleep and decrease in quality of sleep (Kelly, Blake, Power, O'Keeffe & Fullen 2011). Furthermore, moderate evidence exists for a link between poor sleep and dysfunctional regulation of emotions (Jansson-Fröjmark, Norell-Clarke & Linton 2015).

4.2 Enjoyment of life

In literature, life satisfaction has been defined as person's subjective experience of his/her quality of life (Boonstra, Reneman, Stewart, Post & Schiphorst Preuper 2012), and for the purpose of this thesis it is regarded synonymous with the term "en-

joyment of life”. Comparing to biopsychosocial point of view, life satisfaction focuses more on happiness and well-being of a person, covering variety of domains such as self-care and social relationships. Current evidence concerning relationship between chronic pain and life satisfaction is insufficient to draw conclusions from, though it now seems pain is related to decrease in life satisfaction. (Boonstra, Reneman, Stewart, Post & Schiphorst Preuper 2012)

5 THERAPEUTIC EXERCISE

Therapeutic exercises are defined as use of specific exercises and/or movements as treatment. The aims are to affect patient's performance in daily activities and functional capacity. (Arokoski, Mikkelsen, Pohjolainen & Viikari-Juntura 2015, 390) Therapeutic exercises take into consideration physical and cognitive features of the patient, and their individual limitations (Kalso, Haanpää & Vainio 2009, 243).

Therapeutic exercise and physical activity are shown to have pain-reducing effects in chronic pain patients, and a large body of evidence supports these claims. (Booth, Moseley, Schiltenwolf, Cashin, Davies & Hübscher 2017; Hayden, van Tulder, Malmivaara & Koes 2005) Therapeutic exercise is an important component of treatment in conditions such as chronic low back pain, chronic whiplash related conditions, osteoarthritis, and fibromyalgia (Nijs et al. 2012). Käypä Hoito – guidelines for treatment of chronic pain recommend primarily non-pharmacological treatments, including therapeutic exercise, and an active role of patient is emphasized. Physical activity should be adopted as part of the treatment if possible. (Website of Käypä Hoito 2017)

Exercise-induced pain relief does not necessarily mean however, that physical function itself has improved. Thus, positive outcomes can be based on improvement of secondary pathologies, like fear, anxiety, and other psychological domains. (Booth, Moseley, Schiltenwolf, Cashin, Davies & Hübscher 2017) One probable cause for pain relief is endogenous analgesia, produced by release of endogenous opioids with-

in the body which increases pain threshold (Nijs et al. 2012). Different relaxation techniques, such as breathing exercises and mental imaging, can also inhibit pain (Kalso, Haanpää & Vainio 2009, 248).

5.1 Yoga

Yoga is described as a mind-body exercise method, with aims of overall well-being and balance of human being. Central components of yoga are breathing, also known as *pranayama*, and different postures, called *asanas*. (Posadzki & Parekh, 2009) In therapeutic settings, yoga is considered to belong to complementary and alternative medicine (CAM) (Sherman et al. 2010). Yoga can be integrated as a part of physiotherapeutic interventions, since yoga and physiotherapy both share the aims of increasing health and well-being of an individual (Posadzki & Parekh 2009).

Various benefits for yoga have been suggested, like improved cardio-respiratory function, and decrease in level of anxiety and depression. Furthermore, active movements create oxidative stress to the tissues, which might result in reduced muscle tension. (Posadzki & Parekh 2009) Other findings suggest regular practice of yoga to decrease attention on pain and improve management of activities of daily living (Tul, Unruh & Dick 2011). Some evidence exists about positive effects of yoga in conditions such as chronic neck pain and chronic low back pain. However, exact mechanisms behind these results are unclear (Michalsen et al. 2012; Sherman et al. 2010), and overall, amount of credible evidence on yoga is limited and insufficient because of the low number of sample sizes and variation in quality of the studies (Posadzki & Ernst 2011).

5.2 Sauna Yoga

Sauna Yoga is an exercise method based on yoga and mindfulness. Tiina Vainio, inventor of Sauna Yoga, came up with the idea initially around 2010. Her idea was based on personal experiences of being under constant stress, her interests in sauna as a quiet space, and the idea of combining exercise to sauna experience. Fundamentally, Sauna Yoga is based on presence, with focus on one's own mind. As a space,

sauna is quiet and free from external stimuli, and it has a strong foothold as part of Finnish culture, perceived as a place of relaxation. (Vainio, personal communication on 9.10.2017; Vainio 2012)

Sauna Yoga International Ltd has been a licensed trademark since 2012, and the company has certified instructors in several countries including Estonia, Finland, Germany, Italy, Japan, Sweden, and USA. Certification is needed to become a Sauna Yoga instructor, and basic level training needs to be passed to get one. Once basic level training is completed, it is possible to study to become an instructor in modified Sauna Yoga as well. Modified Sauna Yoga is another form of Sauna Yoga, where basic exercises are changed so that they are suitable for a person despite having a disability or other form of limitation which prevents them from doing the original form of exercise. (Vainio, personal communication on 9.10.2017)

Sauna Yoga sessions are conducted in sauna with slight modifications compared to Finnish steam sauna. Firstly, temperature of the sauna should be about 50°, otherwise being too hot for practicing Sauna Yoga. Secondly, water is not thrown onto sauna stove during Sauna Yoga. Each session consists of 4-6 exercises, with relaxation in the beginning and end of session, which in total lasts about 30 minutes. Relaxation acts as a transition period leading in and out of the exercise phase. Exercises are based on different types of yoga, and new sets of exercises are published twice a year for the use of certified instructors. (Vainio, personal communication on 9.10.2017)

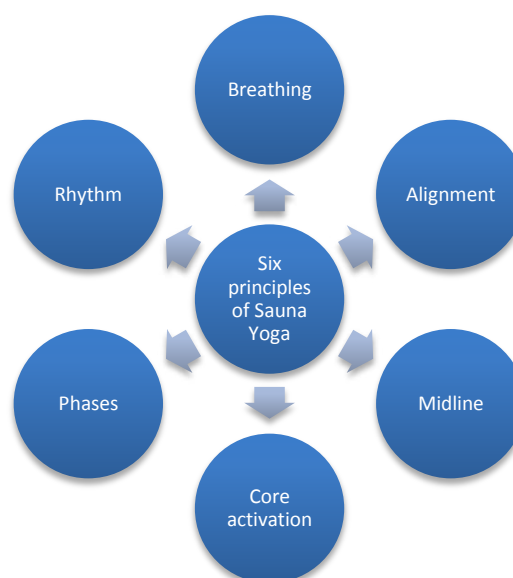


Figure 2. Six principles of Sauna Yoga (Vainio 2012, 16)

Six principles of Sauna Yoga, introduced in figure 2, act as a guideline for exercising. Throughout each movement, breathing should flow in and out with natural rhythm. Breathing combines with movement so that they go hand-in-hand. Alignment refers to the sitting position and base of support while exercising. Feet and pelvis should be in contact with the bench so that position is well supported, as if the body would “plant” itself into it. Movements are all started from this position. From the midline, exercises are done bilaterally and equally to both sides. Before starting the movement, core is activated gently, and instructor advises whether the movement starts with inhale or exhale. Movements are carried out in phases, without rush, and with concentration to abovementioned principles. (Vainio, personal communication on 9.10.2017; Vainio 2012, 16)

6 HEAT AND SAUNA

There are up to three million saunas in Finland, and tradition of sauna bathing has remained for centuries. Sauna is a room or a building of its own, with wood-paneled walls and wooden benches. Traditional Finnish steam sauna is heated using a sauna stove with rocks on it, and when water is thrown to hot rocks, humidity of sauna changes. (Crinnion 2011; Karjanoja & Peltonen 1997, 31-32) In sauna, heat, humidity, and ventilation need to be in correct relation with each other. Ideal temperature for sauna is about 80°-90° at face level, and 30° at floor level. Humidity changes and increases each time water is thrown onto sauna stove. In sauna, lighting is dim which has a relaxing and calming effect. (Karjanoja & Peltonen 1997, 31-32, 42-43) Despite the existence of other types of sauna, for the purpose of this thesis introducing them wasn't necessary because implementation of Sauna Yoga was conducted in a Finnish steam sauna.

Sauna causes physiological reactions to human body functions. Sudden exposure to sauna's heat puts body under thermal stress, causing alterations to homeostasis of the

body. These alterations include sweating, vasodilation, and change in temperature of the skin and deep segments of the body. In addition, peripheral circulation and heart rate increase. Elevation of body heat is similar to what happens under light physical loading, and thermal stress increases secretion of hormones such as norepinephrine, beta-endorphins, prolactin, and growth hormone. (Crinnion 2011; Karjanoja & Peltonen 1997, 68-69)

As a therapy method sauna is used rarely and therefore there is only limited evidence of its benefits (Crinnion 2011). For people with chronic pain combining multidisciplinary treatment with thermal therapy conducted in a sauna setting can be beneficial, resulting as decrease in experienced pain (Masuda, Koga, Hattanmaru, Minagoe & Tei 2005). Japanese invention Waon therapy uses infrared-ray dry sauna in a therapeutic setting. In Waon method, patient is put in a sauna for a period of time, which is partially spent covered under a warm blanket. Studies conducted about effects of Waon therapy are mostly limited to cardiac conditions, but on a side note, they do show possible positive implications towards improving quality of life. (Sobajima et al. 2015; Tei et al. 2016) Characteristics of Waon therapy share similarities with Sauna Yoga, especially concerning temperature of 60° which is approximately the same as used in Sauna Yoga.

In general, application of heat is considered as a method of therapy used to increase body temperature locally, using either moist or dry heat. Therapeutic effects of heat are proposed to be based on analgesia and reduction in muscle tone. Application of heat causes physiological changes to the body, including increased blood circulation, tissue metabolism, and joint flexibility, as well as reduced muscle tonus. (Arokoski, Mikkelsen, Pohjolainen & Viikari-Juntura 2015, 393-394; Igaki, Higashi, Hamamoto, Kodama, Naito & Tokuhara 2013; Nadler, Weingand & Kruse 2004) Brain also reacts to applied heat. Study by Davis et al. concluded, based on functional MRI results, that activation on certain brain areas was higher after application of heat. This could possibly have an inhibiting effect on pain experience. (Davis, Kwan, Crawley & Mikulis 1998) As mentioned on previous chapter, sauna is a moist and humid environment. However, in Sauna Yoga water is not thrown onto sauna stove, consequently there is less variability in humidity of sauna. (Vainio, personal communication on 9.10.2017) In general, using moist heat is perceived more efficacious than

dry heat. This is because moist heat warms up tissue quicker because of faster pace of energy transfer. It is unclear whether or not that is therapeutically significant because of insufficient evidence. (Nadler, Weingand & Cruse 2004; Petrofsky et al. 2013)

7 AIM AND OBJECTIVES OF THE THESIS

Aim of this thesis is to study how practicing Sauna Yoga affects sleep and enjoyment of life in patients who have chronic pain. This is studied over the course of a six-week intervention period of Sauna Yoga. The study questions are based on the Brief Pain Inventory Short Form -questionnaire (BPI-SF), which is filled before and after the intervention period.

Based on the questionnaire results concerning sleep and enjoyment of life, objective is to identify can Sauna Yoga be considered as an effective treatment and exercise method for patients who have chronic pain. Objective is to answer to the following study questions:

1. How does a six-week intervention period of Sauna Yoga effect sleep in patients with chronic pain?
2. How does a six-week intervention period of Sauna Yoga effect enjoyment of life in patients with chronic pain?

8 METHODOLOGY

Implementation period of this thesis was conducted in cooperation with Elina Höckert and Erika Santala, who are both physiotherapists and certified Sauna Yoga instructors. To avoid bias, author of the thesis was not involved in planning nor conduction of Sauna Yoga sessions. Instructors were also responsible for choosing suit-

able exercises used in the Sauna Yoga sessions. Exercises can be found on appendix C. Implementation period was conducted in Spring 2017, during which participants engaged in one instructed Sauna Yoga session per week, and six sessions were arranged in total.

8.1 Participants

The target group consisted of eight Finnish females, ages 44-67. Inclusion criteria for participants was females with musculoskeletal pain with duration of three months or longer. Exclusion criteria included pregnancy, male subjects, children, and persons with neurological conditions. Dropout rate during intervention period was 16% (2 out of 8 subjects).

8.2 Brief pain Inventory Short Form

The English version of the Brief Pain Inventory Short Form (BPI-SF) was used for data collection of this thesis (Appendix A). Worldwide, BPI-SF has been used in over 400 studies and translated into several languages. Originally, BPI-SF was created to be used with cancer patients but it has been used for multiple conditions, such as low back pain, chronic non-malignant pain, and osteoarthritis. Furthermore, several studies have addressed reliability and validity of BPI-SF. (de Andrés Ares 2015; Erdemoglu & Koc 2013; Mendoza, Mayne, Rublee & Cleeland 2006; Tan, Jensen, Thornby & Shanti 2004)

8.3 Data collection

Data for this thesis was collected with BPI-SF and separate background information form. Each participant filled BPI-SF twice; once before start of intervention period, and again after the intervention period was finished. Background information form was filled only before beginning of intervention period. Questionnaires were filled under guidance at both times. This was necessary since BPI-SF is yet to be published in Finnish and therefore questions needed to be translated to some of the participants.

Questions in BPI-SF use time frame of “last 24 hours”. Figure of a “pain map” is included, onto which patients could mark where they experience pain. On the last section of BPI-SF, questions concern interference of pain among physical, psychological, and social domains. Foundation of study questions of the thesis is in the last section, on questions F (interference on sleep) and G (interference on enjoyment of life).

8.4 Background information form and diary

Background information form was created by author of the thesis, to be filled before intervention period began (Appendix B). Form included contact info of each participant and questions about their status of employment, past medical history, and sleep-related domains, providing additional information.

Participants were also asked to keep a diary during Sauna Yoga intervention period. Keeping a diary was not mandatory, nor were the diaries filled on any formal document. Keeping them was a wish from author of this thesis and instructors of the sessions. This was because Sauna Yoga has not been used much for chronic pain groups yet and therefore, feedback was discussed to be important. Participants were guided to write down thoughts and feelings about how they felt before and after each session, how they felt on the following day, and to write down any events they felt that had had a significant impact on their pain experience. In the end of the intervention, three out of six participants returned a written feedback form. Oral feedback was received from all participants in a meeting held after the intervention period.

9 RESULTS

BPI-SF questionnaire results for sleep and enjoyment of life are presented in this chapter. Three values were calculated; mean value of scores, mean value of change, and standard deviation. Dropout rate during intervention was 16% (2 out of 8 sub-

jects). Their pre-intervention scores are not included in the tables, nor are their initial scores calculated into the pre-intervention mean values.

9.1 Effects of Sauna Yoga on sleep

Statistics pre- and post-intervention about effect of pain on sleep can be seen on table 1. Question was how much pain had affected sleep during previous 24 hours. Answers were marked on a scale of 0 to 10, 0 referring to no pain interference and 10 referring to pain completely interfering with sleep. Mean value of the scores was 4,5 pre-intervention and 4,0 post-intervention. Mean value of the change was 0,5, and standard deviation was 1,225. This means the results were not statistically significant, even though mean value of the scores was lower post-intervention. Whereas mean value of scores simply is the mean of these six individual scores, mean value of the change and standard deviation show the large variation among individual results.

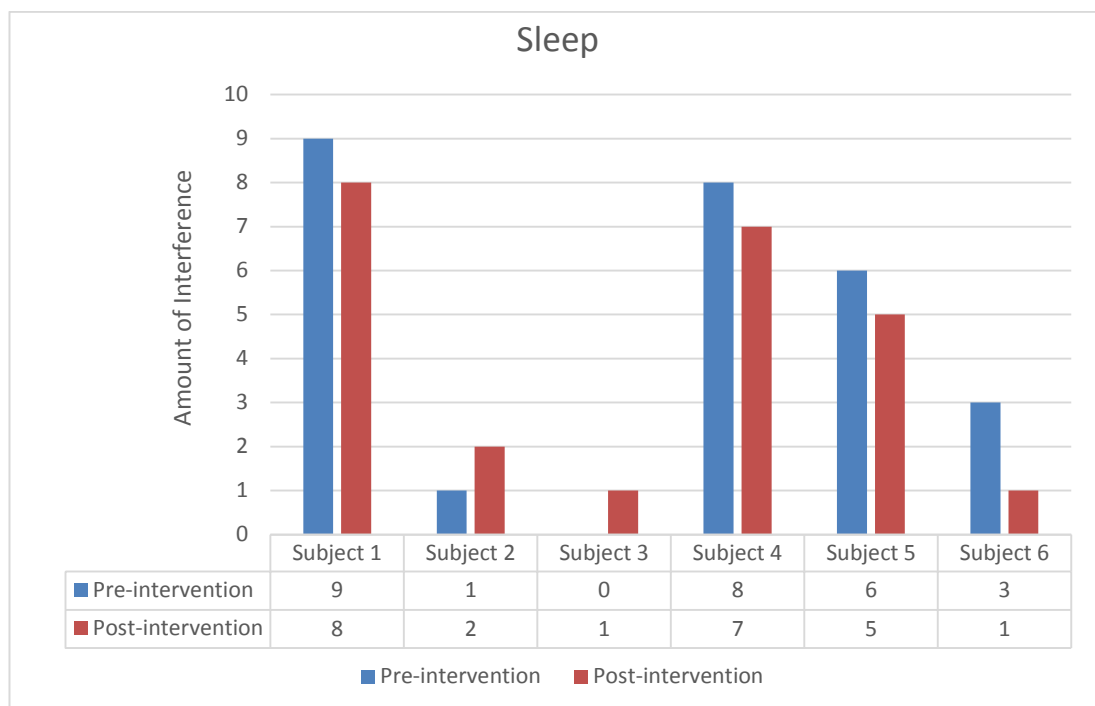


Table 1. Effects of Sauna Yoga intervention period on how much pain interferes with sleep.

9.2 Effects of Sauna Yoga on enjoyment of life

Statistics pre- and post-intervention about effect of pain on enjoyment of life can be seen on table 2. Question was how much pain had affected enjoyment of life during previous 24 hours. Answers were marked on a scale of 0 to 10, 0 referring to no interference with enjoyment of life, and 10 referring to completely interference with enjoyment of life. Mean value of the scores was 3,7 pre-intervention and 3,2 post-intervention. Mean value of the change was 0,5 and standard deviation 1,049. Results were not statistically significant either for the second measure.

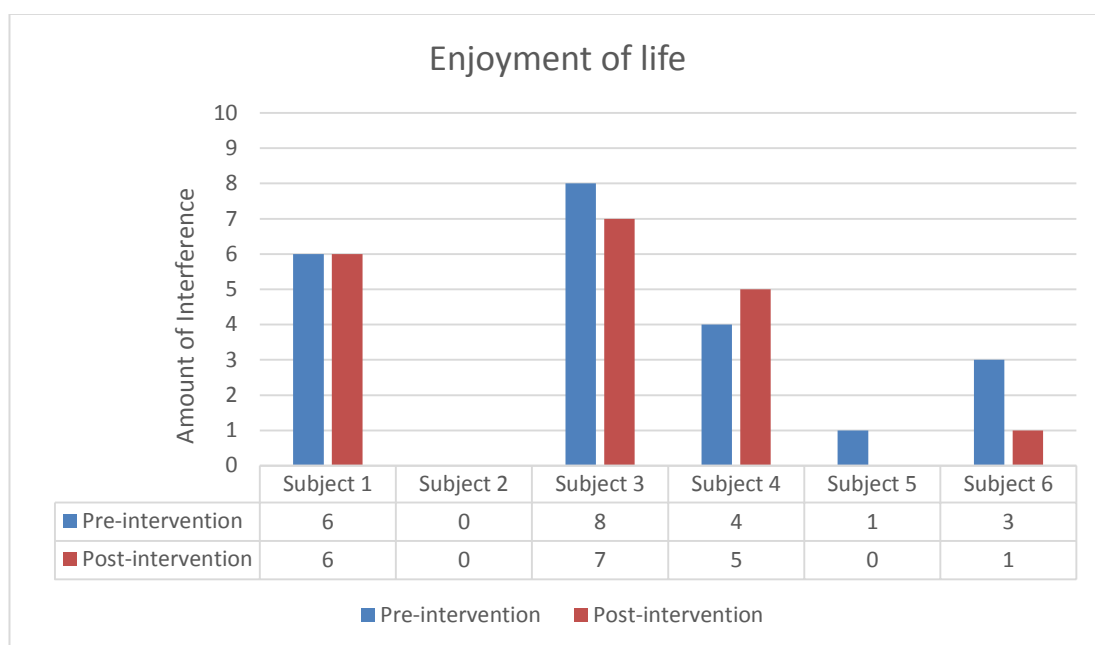


Table 2. Effects of Sauna Yoga intervention period on how much pain interferes with enjoyment of life.

10 CONCLUSION

Objective of this thesis was to identify can Sauna yoga be considered as an effective treatment and exercise method for patients with chronic pain. This was to be done by answering the two study questions, which were:

1. How does a six-week intervention period of Sauna Yoga effect sleep in patients with chronic pain?
2. How does a six-week intervention period of Sauna Yoga effect enjoyment of life in patients with chronic pain?

For both study questions, mean values of the scores were lower post-intervention compared to pre-intervention. However, statistically results of this study were not significant. This is due to high variability in individual pre- and post-intervention scores. By observing only mean values of the scores, a conclusion could be drawn that Sauna Yoga has a slightly positive impact when it comes to the amount of pain interference with sleep and enjoyment of life. However, the other two values, especially large deviation of scores, gives implication that effects of Sauna Yoga concerning sleep and enjoyment of life are highly individual.

11 DISCUSSION

If it hadn't been for the school lecture in spring 2016, most likely my thesis would have revolved around a completely different topic. I'm glad I had the opportunity to conduct my thesis about Sauna Yoga. In that school lecture, Tiina Vainio introduced what is the concept about, and gave ideas about possible topics, of which chronic pain hit me on some level. Soon I found myself contacting teachers and informing them I had found my topic.

In August 2016, Tiina Vainio organized a Sauna Yoga class for me and few other people. We were taught about the philosophy of Sauna Yoga, and served material which includes theoretical knowledge. Most exciting part of that day was definitely the Sauna Yoga session Tiina instructed for us. Personally, I found Sauna Yoga to be extremely refreshing and relaxing. The following night I slept well, and the following day I felt as if my body had had a really good overall stretch. That was when I started to believe Sauna Yoga really could be something to be used as a physiotherapeutic intervention.

This belief grew on me as I began to write theoretical background of the thesis. Topics included in the theoretical background deal with separate domains which all become intertwined in Sauna Yoga; well-being, exercise, yoga, heat, and sauna. These domains all have features which biopsychosocial model brings together. Sauna Yoga is not only about physical exercise, and it very much deals with wellness of mind. Social point of view is involved since exercise was conducted in a group setting. Sauna Yoga does combine several aspects together, which in therapeutic settings are often used separately, like heat.

I would call Sauna Yoga a low threshold activity. At first it might sound odd that sauna would be a place for any type of exercise, but on second thought it sounds rather intriguing. In my opinion, the biggest advantage of Sauna Yoga is the environment; sauna. Culturally, sauna bathing is part of Finnish way of life, and rarely it brings up negative emotions in people. I can't think of anyone I have ever known say a bad word about sauna. Sauna has such a strong positive context that it can be perceived as a low threshold place to go to, which also makes practicing Sauna Yoga effortless. Of course, some might say that it is offensive to use sauna for exercise purposes, but I think Sauna Yoga is done in respect to the space. However, as a Finnish native, I am not able to discuss how this concept of exercising in sauna would be perceived by a foreign person, and whether or not the context would be positive or negative.

This work is much revolved around chronic pain, and thus it was important to carefully introduce its concept. There are many astonishing things about chronic pain. First of all, there is an endless amount of research conducted about it. Concerning writing process that provided a challenge as in what information to go with. Secondly, it has only been during these last few decades that pathophysiology of chronic pain has been began to understand. However, there is still much to be done. Thirdly, it seems that the current knowledge, provided by research, has not yet reached general population and perhaps not even all health care professionals. Misinformation and false beliefs are common. Education is key, and required to change beliefs, attitudes, and to understand chronic pain. It takes a long period of time for this to become reality. Change is necessary however, since chronic pain is so common and it

costs a great deal to society. In my opinion solution to phenomena of chronic pain is not in one thing, it is in several things. These several things are different for each person because of our individuality, and that is why treatment of these people is such a challenge. What I do believe in is promoting patient's own activity, and that is where Sauna Yoga can come into play. Whether or not it would be called a therapeutic intervention, a hobby, or just "an activity this person likes to do", it could be involved in the life of a chronic pain patient and certainly something that can be at least tried out. One size does not fit all, and therefore it would be important to give a try to different treatments and activities.

Nevertheless, results of this intervention gave promising results. From the intervention group, only one person had been to Sauna Yoga before. For the others it was all new, and thus the first sessions showed a need for few adjustments. People in general react differently to things, and chronic pain adds an aspect to it. One of the things was the heat of 50-60°, which one participant experienced as too high and uncomfortable. Solution was that she changed to sit on a bench that was lower. Another participant mentioned the importance of hydration before, during, and after exercise session, and eating lightly rather than having a full meal before exercise session. Exercises included into this implementation period were modified if needed. One participant told being frustrated at first because she experienced exercises to be too challenging for her. Adjustments were made to those exercises, based on individual needs. This meant that time management of a single session improved as implementation period went further on, as participants began to know how they reacted to warmth, how to prepare for a session, and what exercise modifications they could do if needed. Aforementioned examples of participants' experiences were picked from the diaries of participants and/or discussed during the group meeting, which was held after intervention period was over.

Overall, this thesis has its strengths and limitations. Theoretical background does include a wide spectrum of domains associated with Sauna Yoga, however, I would have wanted to go much deeper in the theoretical background, but the amount of work would have required two authors for the topic. Knowledge about chronic pain will most likely evolve in following years, but already amount of research is massive and it was difficult to write a comprehensive and understandable theory part, which

would be based on the current knowledge about chronic pain. In this thesis, inclusion and exclusion criteria could have been defined more specific, for instance by narrowing down age group or defining specific location for participants' pain. Furthermore, if I repeated this intervention, I would probably change the questionnaire to another one. BPI-SF has its limitations because it is not available in Finnish, and the time frame of 24 hours is too limited to be used in a six-week intervention. However, BPI-SF gave good, specific parameters where study questions could be based on.

In addition to intriguing results of implementation period, I wish this thesis gave an introduction to the concept of Sauna Yoga. In this discussion, I wanted to provide arguments and answers to why this thesis was conducted in the way it was, and also give my own insight into how I personally think about these matters. For the future, Sauna Yoga provides endlessly opportunities to conduct research about. Possible thesis topics for instance could be an intervention period conducted with working age men who have chronic pain, or a literature review which focuses more in-depth on existing evidence concerning domains involved in Sauna Yoga. Options are limitless because Sauna Yoga has not been extensively studied yet.

REFERENCES

- Amarins, W.J., van Wilgen, P., Meeus, M. & Nijs, J. 2016. Clinical biopsychosocial physiotherapy assessment of patients with chronic pain: The first step in pain neuroscience education. *Physiotherapy Theory and Practice*. Referred 20.7.2017.
DOI: 10.1080/09593985.2016.1194651
- Arokoski, J., Mikkelsen, M., Pohjolainen, T. & Viikari-Juntura, E. 2015. *Fysiatría*. Helsinki: Kustannus Oy Duodecim.
- Bannister, K., Kucharczyk, M. & Dickenson, A.H. 2017. Hopes for the Future of Pain Control. *Pain and Therapy*. Referred 8.11.2017
DOI 10.1007/s40122-017-0073-6
- Bettini, L. & Moore, K. 2016. Central Sensitization in Functional Chronic Pain Syndromes: Overview and Clinical Application. *Pain Management Nursing*. Referred 11.10.2017.
DOI 10.1016/j.pmn.2016.05.008
- Boonstra, A.M., Reneman, M.F., Stewart, R.E., Post, M.W. & Schiphorst Preuper, H.R. 2012. Life satisfaction in patients with chronic musculoskeletal pain and its predictors. *Quality of Life Research*. 22, 93-101. Referred 22.10.2017.
DOI 10.1007/s11136-012-0132-8
- Booth, J., Moseley, G.L., Schiltenswolf, M., Cashin, A., Davies, M. & Hübscher, M. 2017. Exercise for chronic musculoskeletal pain: A biopsychosocial approach. *Musculoskeletal Care*. 1-9. Referred 28.10.2017.
DOI:10.1002/msc.1191
- Borstad, J. & Woeste, C. 2015. The Role of Sensitization in Musculoskeletal Shoulder Pain. *Brazilian Journal of Physical Therapy*. 19, 251-256. Referred 12.10.2017.
DOI:10.1590/bjpt-rbf.2014.0100
- Brennan, M.J. & Lieberman, J.A. 2009. Sleep Disturbances in Patients with Chronic Pain: Effectively Managing Opioid Analgesia to Improve Outcomes. *Current Medical Research and Opinion*. 25, 1045-1055. Referred 12.10.2017.
DOI:10.1185/03007990902797790
- Butler, D.S. & Moseley, G.L. 2006. *Explain Pain*. Adelaide: Noigroup Publications.
- Cleeland, C.S. 1991. Brief Pain Inventory Short Form. Pain Research Group.
http://www.npcrc.org/files/news/briefpain_short.pdf
- Crinnion, W.J. 2011. Sauna as a Valuable Clinical Tool for Cardiovascular, Auto-immune, Toxicant-induced and other Chronic Health Problems. *Alternative Medicine Review*, 3. Referred 7.2.2017.
PMID:21951023

Cruccu, G., Sommer, C., Anand, P., Attal, N., Baron, R., Garcia-Larrea, L., Haanpää, M., Jensen, T.S. & Serra, J. & Treede, R.-D. 2010. EFNS Guidelines on Neuropathic Pain Assessment: Revised 2009. *European Journal of Neurology*. 17, 1010-1018. Referred 11.10.2017.

DOI:10.1111/j.1468-1331.2010.02969.x

Davis, K.D., Kwan, C.L., Crawley, A.P. & Mikulis, D.J. 1998. Functional MRI Study of Thalamic and Cortical Activations Evoked by Cutaneous Heat, Cold, and Tactile Stimuli. *Journal of Neurophysiology*. 80, 1533-1546. Referred 26.10.2017. PMID: 9744957.

de Andrés Ares, J., Cruces Prado, L.M., Canos Verdecho, M.A., Penide Villanueva, L., Del Valle Hoyos, M., Herdman, M. & Traseira Lugilde, S. & Velázquez Rivera, I. 2015. *Pain Practitioner* 15, 643-53. Referred 3.2.2017.

DOI:10.1111/papr.12219.

Dodge, R., Daly, A., Huyton, J., & Sanders, L. 2012. The challenge of defining well-being. *International Journal of Wellbeing*, 2(3), 222-235. Referred 27.8.2017.

DOI:10.5502/ijw.v2i3.4

Engel, G. 1977. The Need for a New Medical Model: A Challenge for Biomedicine. *Science, New Series*. 4286, 129- 136. Referred 15.6.2017.

URL: <http://www.jstor.org/stable/1743658> .

Erdemoglu, A.K. & Koc, R. 2013. Brief Pain Inventory score identifying and discriminating neuropathic and nociceptive pain. *Acta Neurologica Scandinavica* 128(5):351-8. Referred 10.2.2017.

DOI: 10.1111/ane.12131

Expert Group on Management of Chronic Pain and Cancer Pain 2017. National Action Plan for Treatment of Chronic Pain and Cancer Pain for 2017–2020. Ministry of Social Affairs and Health 2017, Finland. Referred 12.10.2017

URN: ISBN:978-952-00-3850-2

Flor, H. 2000. The Functional Organization of the Brain in Chronic Pain. *Progress in Brain Research*, Vol 129, 313-322. Referred 12.7.2017.

DOI:10.1016/S0079-6123(00)29023-7

Gatchel, R.J. 2004. Comorbidity of Chronic Mental and Physical Health Conditions: The Biopsychosocial Perspective. *American Psychologist*. 59, 792– 805. Referred 8.11.2017.

Haanpää, M., Hagelberg, N., Hannonen, P., Liira, H. & Pohjolainen, T. No date. Kroonisen kivun hoito-opas. Referred 20.10.2017. https://skty-org-bin.directo.fi/@Bin/e28e9e53c607b2c280e7fc8d7ebd2019/1510074438/application/pdf/171537/Kroonisen%20kivun%20hoito-opas_final.pdf

Hayden, J.A., van Tulder, M.W., Malmivaara, A.V. & Koes, B.W. 2005. Meta-analysis: exercise therapy for nonspecific low back pain. *Annals of Internal Medicine*. 142. Referred 22.10.2017.

PMID: 15867409

Howell, A.J., Digdon, N.L., Buro, K., & Sheptycki, A.R. 2008. Personality and Individual Differences. 8, 773-777. Referred 27.8.2017.
DOI:10.1016/j.paid.2008.08.005

Hruschak, V. & Cochran, G. 2017. Psychosocial and Environmental Factors in the Prognosis of Individuals with Chronic Pain and Comorbid Mental Health. *Social Work in Health Care*. Referred 21.10. 2017.
DOI:10.1080/00981389.2017.1326074.

Höckert, E. & Santala, E. 2017. Sauna Yoga- harjoitus kroonisille kipupotilaille.

Igaki, M., Higashi, T., Hamamoto, S., Kodama, S., Naito, S. & Tokuhara, S. 2013. A Study of the Behavior and Mechanism of Thermal Conduction in the Skin Under Moist and Dry Heat Conditions. *Skin Research and Technology*. 0, 1-7. Referred 26.10.2017.
DOI: 10.1111/srt.12081

Itani, O., Jike, M., Watanabe, N. & Kaneita, Y. 2016. Short Sleep Duration and Health Outcomes: A Systematic Review, Meta-analysis and Meta-regression, *Sleep Medicine*. Referred 26.8.2017.
DOI: 10.1016/j.sleep.2016.08.006

Jansson-Fröjmark, M., Norell-Clarke, A. & Linton, S.J. 2015. The Role of Emotion Dysregulation in Insomnia: Longitudinal Findings from A Large Community Sample. *British Journal of Health Psychology*. 21, 93-113. Referred 3.10.2017.
DOI:10.1111/bjhp.12147

Kalso, E., Haanpää, M. & Vainio, A. 2009. Kipu. Keuruu: Otava.

Karjanoja, M. & Peltonen, J. 1997. Sauna – made in Finland. Tampere: Tammi.

Kelly, G.A., Blake, C., Power, C.K., O’Keeffe, D. & Fullen, B.M. 2011. The Association Between Chronic Low Back Pain and Sleep A: Systematic Review. *The Clinical Journal of Pain*. 27, 169-181. Referred 26.8.2017.
DOI: 10.1097/AJP.0b013e3181f3bdd5

Kundermann, B. & Lautenbacher, S. 2007. Effects of Impaired Sleep Quality and Sleep Deprivation on Diurnal Pain Perception. *Sleep and Pain*. Referred 25.10.2017.
<https://www.uni-bamberg.de/>

Latremoliere, A. & Woolf, C.J. 2009. Central Sensitization: A Generator of Pain Hypersensitivity by Central Neural Plasticity. *The Journal of Pain*. 10, 895-926. Referred 4.10.2017.
DOI:10.1016/j.jpain.2009.06.012.

Masuda, A., Koga, Y., Hattanmaru, M., Minagoe, S. & Tei, C. 2005. The Effects of Repeated Thermal Therapy for Patients with Chronic Pain. *Psychotherapy and Psychosomatics* 74, 288-294. Referred 15.6.2017.
DOI:10.1159/000086319

Mendoza, T., Mayne, T. & Rublee, D. & Cleeland, C. 2006. Reliability and validity of a modified Brief Pain Inventory short form in patients with osteoarthritis. *European Journal of Pain* 4, 353–361. Referred 10.2.2017.

DOI:10.1016/j.ejpain.2005.06.002

Michalsen, A., Traiteur, H., Lütke, R., Brunnhuber, S., Meier, L., Jeitler, M., Büssing, A., Kessler, C. 2012. Yoga for Chronic Neck Pain: A Pilot Randomized Controlled Clinical Trial. *The Journal of Pain*. 11, 1122. Referred 19.9.2016.

DOI: 10.1016/j.jpain.2012.08.004

Moseley, G.L. 2007. Reconceptualising Pain According to Modern Pain Science. *Physical Therapy Reviews*. Referred 3.11.2017.

DOI:10.1179/108331907X223010

Moseley, G.L. & Butler, D. 2017. *Explain Pain Supercharged*. Adelaide: Noigroup Publications.

Moseley, G.L. & Vlaeyen, J.W.S. 2015. Beyond nociception: the imprecision hypothesis of chronic pain. *Pain Journal Online*. 156, 35-38. Referred 21.7.2017.

www.bodyinmind.org

Nadler, S.F., Weingand, R. & Kruse, R.J. 2004. The Physiologic Basis and Clinical Applications of Cryotherapy and Thermotherapy for the Pain Practitioner. *Pain Physician* 7, 395. Referred 26.10.2017.

PMID: 16858479

Nijs, J., Kosek, E., Van Oosterwijck, J. & Meeus, M. 2012. Dysfunctional Endogenous Analgesia During Exercise in Patients with Chronic Pain: To Exercise or Not to Exercise? *Pain Physician* 15, 206. Referred 21.9.2016.

PMID: 22786458

Ohara, P.T., Vit, J.P. & Jasmin, L. 2005. Cortical Modulation of Pain. *Cellular and Molecular Life Sciences*. 62, 44-52. Referred 8.11.2017.

DOI: 10.1007/s00018-004-4283-9

Pergolizzi, J., Ahlbeck, K., Aldington, D., Alon, E., Coluzzi, F., Dahan, A., Huygen, F., Kocot-Kepska, M., Mangas, A.C., Mavrocordatos, P., Morlion, B., Müller-Schwefe, G., Nicolau, A. & Perez Hernandez, C. & Sichere, P. 2013. The development of chronic pain: physiological CHANGE necessitates a multidisciplinary approach to treatment. *Current Medical Research and Opinion*. 9, 1127-1135. Referred 15.6.2017.

DOI:10.1185/03007995.2013.810615

Petrofsky, J., Berk, L., Bains, G., Khowailed, I.A., Hui, T., Granado, M. & Laymon, M. & Lee, H. 2013. Moist heat or dry heat for delayed onset muscle soreness. *Journal of Clinical Medicine Research*. 5, 416-425. Referred 28.10.2017.

DOI: 10.4021/jocmr1521w.

Posadzki, P. & Ernst, E. 2011. Yoga for low back pain: a systematic review of randomized clinical trials. *Clinical Rheumatology*. 30, 1257-1262. Referred 26.7.2017.

DOI 10.1007/s10067-011-1764-8

Posadzki, P. & Parekh, S. 2009. Yoga and Physiotherapy: A Speculative Review and Conceptual Synthesis. *Chinese Journal of Integrative Medicine*. 15, 66-72. Referred 26.7.2017.

DOI: 10.1007/s11655-009-0066-0

Sherman, K.J., Cherkin, D.C., Cook, A.J., Hawkes, R.J., Deyo, R.A. & Wellman, R. & Khalsa, P.S. 2010. Comparison of yoga versus stretching for chronic low back pain: protocol for the Yoga Exercise Self-care (YES) trial. *Trials*, 11. Referred 19.7.2017.

DOI:10.1186/1745-6215-11-36

Sobajima, M., Nozaawa, T., Fukui, Y., Ihori, H., Ohori, T. & Fujii, N. & Inoue, H. 2015. Waon Therapy Improves Quality of Life as Well As Cardiac Function and Exercise Capacity in Patients with Chronic Heart Failure. *International Heart Journal*. 2, 203-208. Referred 24.10.2017.

DOI: 10.1536/ihj.14-266

Tan, G., Jensen, M.P. & Thornby, J.I. & Shanti, B.F. 2004. Validation of the Brief Pain Inventory for chronic non-malignant pain. *The Journal of Pain* 2, 133–137. Referred 10.2.2017.

DOI: 10.1016/j.jpain.2003.12.005

Taylor, R. 2006. Pain: Subtypes, Prevalence, and Associated Conditions. In: *Cognitive Behavioural Therapy for Chronic Illness and Disability*. Boston, MA: Springer.

Tei, C., Imamura, T., Kinugawa, K., Inoue, T., Masuyama T., Inoue, H., Noike, H., Muramatsu, T., Takeishi, Y., Saku, K., Harada, K., Daida, H., Kobayashi, Y., Hagiwara, N., Nagayama, M., Momomura, S., Yonezawa, K., Ito, H., Gojo, S., Akaishi, M. & Miyata, M. & Ohishi, M. 2016. Waon Therapy for Managing Chronic Heart Failure. *Circulation Journal*. 80, 827-834. Referred 24.10.2017.

DOI:10.1253/circj.CJ-16-0051

Treede, R.D., Kenshalo, D.R., Gracely, R.H. & Jones, A.K.P. 1998. The Cortical Representation of Pain. *Pain*. 2-3, 105-111. Referred 28.8.2017.

Treede, R.D., Rief, W., Barke, A., Aziz, Q., Bennett, M.I., Benoliel, R., Cohen, M., Evers, S., Finnerup, N.B., First, M.B., Giamberardino, M.A., Kaasa, S., Kosek, E., Lavand'homme, P., Nicholas, M., Perrot, S., Scholz, J., Schug, S., Smith, B.H., Svensson, P. & Vlaeyen, J.W.S. & Wang, S. 2015. A classification of chronic pain for ICD-11. *Pain Journal Online*, 6. Referred 25.7.2017.

DOI: 10.1097/j.pain.0000000000000160

Tsay, A., Allen, T.J., Proske, U. & Giummarra, M. 2015. Sensing the body in chronic pain: A review of psychophysical studies implicating altered body representation. *Neuroscience and Biobehavioral Reviews*. Referred 5.10.2017.

DOI: 10.1016/j.neubiorev.2015.03.004.

Tul, Y., Unruh, A. & Dick, B.D. 2011. Yoga for chronic pain management: a qualitative exploration. *Scandinavian Journal of Caring Sciences*. 25, 435-443. Referred 23.10.2017.

DOI: 10.1111/j.1471-6712.2010.00842.x

Vainio, T. 2012. Saunajooga: Rauhoitu ja rentoudu. EU: WSOY.


Vainio, T. 2017. Vainio, Sauna Yoga International Ltd. Helsinki. Skype Interview 9.10.2017. Interviewer Johanna Pajukorpi.

Website of Käypä Hoito. Referred 10.10.2017.
<http://www.kaypahoito.fi/web/kh/etusivu>

Williams, A., Craig, K.D. 2016. Updating the Definition of Pain. PAIN 157. Referred 19.7.2017.

DOI: 10.1097/j.pain.0000000000000613.

BRIEF PAIN INVENTORY SHORT FORM (BPI-SF)


 Date: / /
(month) (day) (year)

Study Name: _____
 Protocol #: _____
 PI: _____
 Revision: 07/01/05

Subject's Initials : _____
 Study Subject #:

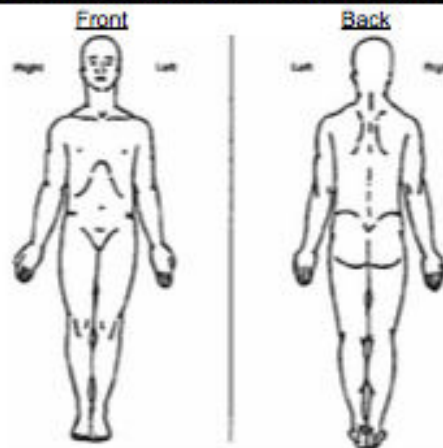
PLEASE USE BLACK INK PEN

Brief Pain Inventory (Short Form)

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

Yes No

2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.



3. Please rate your pain by marking the box beside the number that best describes your pain at its **worst** in the last 24 hours.

0 1 2 3 4 5 6 7 8 9 10
 No Pain Pain As Bad As You Can Imagine

4. Please rate your pain by marking the box beside the number that best describes your pain at its **least** in the last 24 hours.

0 1 2 3 4 5 6 7 8 9 10
 No Pain Pain As Bad As You Can Imagine

5. Please rate your pain by marking the box beside the number that best describes your pain on the **average**.

0 1 2 3 4 5 6 7 8 9 10
 No Pain Pain As Bad As You Can Imagine

6. Please rate your pain by marking the box beside the number that tells how much pain you have **right now**.

0 1 2 3 4 5 6 7 8 9 10
 No Pain Pain As Bad As You Can Imagine

BACKGROUND INFORMATION FORM



Esitietolomake

YHTEYSTIEDOT		
Nimi:		
Puhelin:		
Sähköposti:		
Sukupuoli:		
Ikä:		
Ammatti:		
KIPU		
1. Onko sinulla diagnosoituja sairauksia? Kyllä / Ei Jos on, mitä?		
2. Minkä kiputilan vuoksi olet mukana tässä ryhmässä?		
3. Kuinka pitkään kyseistä kipua on ollut?		



4. Minkä uskot olevan syynä kyseiseen kipuun?

5. Asteikolla 0-10, kuinka voimakasta kipu on tällä hetkellä?

6. Mitä hoitokeinoja käytät tällä hetkellä kyseisen kivun hoitoon?

7. Minkä koet helpottavan kipua?

TYÖ & VAPAA-AIKA

8. Oletko tällä hetkellä

- a) kokoaikaisesti töissä
- b) osa-aikaisesti töissä
- c) sairauslomalla
- d) osa-aikaeläkkeellä
- e) vanhuuseläkkeellä?

Jos ympyröit vastauksen a tai b, vastaa myös kysymykseen 9.

9. Vaikuttaako kipu työntekoon? Jos vaikuttaa, miten?

10. Onko kipu vaikuttanut harrastuksiin ja vapaa-ajan viettoon? **Kyllä / Ei**
Jos on, miten?

11. Vaikuttaako kipu päivittäisiin askareisiin? **Kyllä / Ei**
Jos vaikuttaa, miten?

UNI

12. Montako tuntia keskimäärin nukut?

13. Tunnetko aamuisin olosi virkeäksi ja levänneeksi?

14. Heräiletkö öisin? **Kyllä / Ei**

Jos vastaat kyllä, vastaa myös kohtiin a, b ja c.

a) Miksi heräät?

b) Kuinka monta kertaa yössä heräät?

c) Saatko nukahdettua uudelleen? **Kyllä / Ei**
Jos et, miksi?

SAUNAYOGA -HARJOITUS KROONISILLE KIPUPOTILAILLE



ALKURENTOUTUS

Käy istumaan lauteille mukavaan asentoon. Suo itsellesi rauhoittumisen hetki lempeässä lämmössä.

Anna hengityksen virrata vapaasti. Keskity läsnä olevaan hetkeen kaikilla aisteilla. Nauti saunan hiljaisuudesta. Tunne mieto lämpö lihaksissasi.

Alkurentoutus rauhoittaa mieltä ja kehoa sekä auttaa keskittymään



NISKAN AVAUKSET

Istu lauteen etuosassa. Kädet rennosti vartalon vierellä. Kallista päätä kohti oikeaa olkapäätä.

Sh: liikuta vasenta kättä hieman eteenpäin

Uh: palauta käsi vartalon viereen.

Toista käden liike 5 kertaa eteen ja taakse.



Pidä pää kallistuneena oikealle olkapäälle. Käännä leukaa kohti kainaloa.

Sh: loitonna vasenta kättä sivusuunnassa pois päin reidestä

Uh: palauta käsi vartalon viereen

Toista käden liike 5 kertaa sivulle ja takaisin.



SAUNATERVEHDYS

Vie kädet selän taakse ja ota kiinni sormista, kynnärvarsista tai kynnärpäistä.

Sh: Pidennä selkää

Uh: tee sivutaivutus oikealle

Sh: palaa takaisin keskelle

Uh: tee sivutaivutus vasemmalle

Sh: palaa takaisin keskelle ja tartu pyyheliinasta kiinni selän takana

Uh: kurkota rintaa pitkälle yli polvien ja

laske rinta polviin.

Sh: palaa ylöspäin, ojenna selkä pitkäksi ja kierrä olkapäitä taakse

Uh: laskeudu alas. Laske pyyhe selän taakse ja laske sormet varpaiden päälle

Sh: rullaa selkä pyöreänä istumaan

Toista liikesarja 4 kertaa





SAUNASOTURI

Aseta kädet vartalon eteen, sormenpäät kyynärpäiden kohdalle. Nosta oikea jalan kantapää ilmaan.

Sh: ojenna oikea polvi suoraksi

Uh: koukista oikea polvi ja paina samanaikaisesti käsiä alaspäin

Sh: ojenna oikea polvi uudelleen suoraksi ja nosta samanaikaisesti kädet eteen

Uh: koukista polvi ja paina samanaikaisesti käsiä alaspäin

Toista 5 kertaa. Tee liike myös vasemmalla jalalla.



Haastavampi vaihtoehto:

Aseta kädet vartalon eteen, sormenpäät kyynärpäiden kohdalle. Jännitä vatsalihakset ja nosta pakarat irti lauteesta.

Sh: nosta oikean jalan kantapää irti lattiasta.

Uh: laske kantapää lattiaan ja paina samanaikaisesti käsiä alaspäin

Sh: nosta oikean jalan kantapää uudelleen ja nosta samanaikaisesti kädet eteen

Uh: laske kantapää lattiaan ja paina samanaikaisesti käsiä alaspäin

Toista 5 kertaa. Tee liike myös vasemmalla jalalla.



SAUNAKIERTO

Istu ryhdikkäästi. Aseta oikea käsi vasemman reiden ulkosyrjään. Aseta vasen käsi selän taakse.

Sh: pidennä selkää

Uh: kierrä rankaa rauhasa vasemmalle niin, että vartalon painopiste pysyy molemmilla istuinluilla. Käännä katse liikkeen mukana.

Pysy asennossa ja hengitä rauhallisesti sisään ja ulos 6 –8 kertaa.

Tee liike myös toiseen suuntaan.



Haastavampi vaihtoehto:

Nojaa oikealla kyynärvarrella reisiin. Aseta vasen käsi selän taakse.

Sh: pidennä selkää

Uh: kierrä rankaa rauhassa vasemmalle niin, että vartalon painopiste pysyy molemmilla istuinluilla. Käännä katse liikkeen mukana.

Pysy asennossa ja hengitä rauhallisesti sisään ja ulos 6-8 kertaa.

Tee liike myös toiseen suuntaan.



VATSALIHAKSET

Istu lauteiden etuosassa. Aseta kädet ristiin rinnalle. Pyyheliinarulla polvien väliin.

Sh: Pidennä selkää ja purista pyyhettä kevyesti polvien välissä

Uh: nojaa hieman taakse selkä suorana

Sh: pysy

Uh: kierrä itseäsi vasemmalle

Sh: palaa keskelle

Uh: kierrä uudestaan vasemmalle

Sh: palaa keskelle ja alkuasentoon.

Purista koko liikkeen ajan pyyheliinaa polvien välissä.

Tee liike myös toiseen suuntaan. Toista 4 kertaa.





LONKAN AVAUKSET

Laita halutessasi hikipytyhe vasemman jalan päälle. Nosta oikea jalka vasemman jalan päälle. Aseta kädet reisien viereen.

Sh: pidennä selkää

Uh: nojaa suoralla eteenpäin ja tunnet venytyksen oikeassa pakarassa

Pysy asennossa 6 –8 rauhallista hengitystä.

Tee liike myös vasen jalka oikean päällä.



Haastavampi vaihtoehto:

Laita halutessasi hikipytyhe vasemman jalan päälle. Nosta oikean jalan sääri/nilkka vasemman jalan päälle. Aseta kädet vartalon eteen, sormenpäät kyynärpäiden kohdalle.

Sh: pidennä selkää

Uh: nojaa suoralla selällä eteenpäin ja laske kädet polven/säären päälle.

Pysy asennossa 6 –8 rauhallista hengitystä.

Tee liike myös vasen jalka oikean päällä.



LOPPURENTOUTUS

Käy lauteille asentoon, jossa voit päästää kaikki lihakset rennoksi. Sulje silmät.

Anna hengityksen virrata vapaasti. Keskity hetkeksi tunnustelemaan harjoituksen tuomaa rentouden tunnetta kehossa ja mielessä.