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Dance/Movement Therapy in Fibromyalgia Patients

*Aspects and Consequences of Verbal,
Visual and Hormonal Analyses*

BY

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Abstract

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This thesis presents hormonal, emotional, physical and visual status changes in female fibromyalgia (FMS) patients after treatment with the Creative Art therapy; dance/movement therapy, compared to controls. FMS is a syndrome of chronic pain involving musculoskeletal aches, stiffness and pain where perturbations in the stress-axis and high scores on somatic anxiety and muscular tension also have been found. The study comprises thirty-six female FMS patients divided in treatment- and control group. Serum concentrations of the hormones prolactin, dehydroepiandrosterone sulphate (DHEA-S), cortisol and neuropeptide Y (NPY) in plasma and cortisol in saliva were analysed. Different verbal self-rating scales concerning well-being, pain, personality and life events among other things have been used. Assessments of the condition of the FMS patients affected by video-viewing were evaluated together with interviews about the self-perception phenomenon of video viewing (a phenomenological hermeneutic method).

The results of the study show that six months of dance/movement therapy appears sufficient to improve both psychological and physical function, as indicated by the visual analyses. The video interpretation technique (VIT) and self-figure drawings captured treatment effects that were not evident from verbal scales or reflected in hormone levels. The biological markers probably need a longer treatment period to activate the HPA axis and its inter-related hormones and peptides.

The use of different assessment techniques most likely has affected the treatment outcome. Difficulties perceiving information through verbal/cognitive modalities as well as alexithymia are factors discussed. The VIT may be useful for early identification of maladaptive movement patterns and as a mirror of facial and bodily expressions of emotions. In conclusion, this study indicates that both the dance/movement therapy and the VIT have had great influence on the FMS patient's well-being, self-perception and perception of pain.

Keywords: fibromyalgia, dance/movement therapy, stress-hormones, video interpretation, self-perception, self-figure drawing

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To my family

*“Vision is the art
of seeing the invisible”*

Jonathan Swift

List of Papers

This thesis is based on the following four papers which are referred to in the text by their Roman numerals:

- I Eva Bojner Horwitz, Töres Theorell, Ulla Maria Anderberg. Dance/movement therapy and changes in stress-related hormones: A study of fibromyalgia patients with video interpretation. *The Arts in Psychotherapy* 2003; 30: 255-264
- II Eva Bojner Horwitz, Jan Kowalski, Töres Theorell, Ulla Maria Anderberg. Dance/movement therapy in fibromyalgia patients: Changes in self-figure drawings and their relation to verbal self-rating scales and hormones. *The Arts in Psychotherapy*, submitted and in progress
- III Eva Bojner Horwitz, Töres Theorell, Ulla Maria Anderberg. Fibromyalgia patients' own experiences of video self-interpretation: A phenomenological hermeneutic study. *Scand J Caring Sciences* 2003; 17: 257-264
- IV Eva Bojner Horwitz, Töres Theorell, Ulla Maria Anderberg. New technique for assessment of self-perception in fibromyalgia patients: A pilot study with video interpretation. *The Arts in Psychotherapy* 2004; 31: 153-164

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Abbreviations

ACTH	Adrenocorticotrophic Hormone
ADTA	American Dance Therapy Association
ACR	American College of Rheumatology
CNS	Central Nervous System
CPRS	Comprehensive Psychopathologic Rating Scale
CRH	Corticotropine-Releasing-Hormone
DHEA-S	Dehydroepiandrosterone sulphate
DMT	Dance/Movement Therapy
FMS	Fibromyalgia Syndrome
HPA	Hypothalamic-Pituitary-Adrenal
HPG	Hypothalamic-Pituitary-Gonadal
MADRS	Montgomery Åsberg Depression Rating Scale
NPY	Neuropeptide Y
SD	Standard Deviation
SOC	Sense of Coherence
SSP	Swedish Universities Scale of Personality
VAS	Visual Analogue Scale
VIT	Video Interpretation Technique

Background

Fibromyalgia syndrome

Fibromyalgia is a syndrome of chronic pain involving musculoskeletal aches, stiffness and pain. Fibromyalgia patients have a general hyperalgesia and their pain thresholds are lowered (Kosek et al. 1996). Although the latest diagnostic criteria of fibromyalgia were established in 1990 (Wolfe et al. 1990), the aetiology remains unknown. The symptoms arise from soft tissue, muscle insertions and bodies of specific muscles including bony prominences. The intensity of pain varies and moves from day to day and from time to time and can be described as burning, shooting or dull. The pain and tenderness may also be exacerbated by physical activity (Mengshoel et al. 1995). In addition to pain, fibromyalgia patients have many other symptoms which are not involved in the diagnostic criteria. These symptoms are concentration problems, impaired and non-restorative sleep with chronic fatigue, stiffness, migraine, headache, cognitive impairment, psychological distress, irritable bowel symptoms and dysmenorrhea (Yunus et al. 1989a, Hudson et al. 1992, Burckhardt et al. 1993, Clauw 1995). These symptoms have negative consequences for the patient's occupational status, quality of life, family life and leisure time (Henriksson 1995). The distinctions of primary fibromyalgia (a symptomatology without concomitant organic illness) and secondary fibromyalgia (a symptomatology attributed to a pre-existing rheumatological or systemic condition) have now been abandoned. There are no differences in symptomatology between primary and secondary fibromyalgia (Wolfe et al. 1990).

Fibromyalgia has lately been considered a chronic pain syndrome with a central rather than a peripheral or muscular set of problems (Yunus et al. 1989b, Simms 1998). A strong relationship to stress-related morbidity (Anderberg 1999a) as well as low levels of serum serotonin (Russel et al. 1992) and perturbed pain processing peptides (Vaeroy et al. 1991, Russel et al. 1994) have been found in fibromyalgia patients.

Diagnostic criteria

In 1990, a multicentre study of diagnostic criteria by the American College of Rheumatology attained consensus about fibromyalgia (Wolfe et al. 1990). The criteria involve:

- A history of widespread pain
- Pain in 11 of 18 tender point sites on digital palpation (4 kg.)

Pain is considered widespread when the following are present:

- Pain in the left and right side of the body
- Pain above and below the waist
- Axial skeletal pain (cervical spine or anterior chest or thoracic spine or low back where “low back” pain is considered lower segment pain)

Pain in the tender point sites must be present in at least 11 of the following 18 sites:

- Occiput: bilateral, at the suboccipital muscle insertions.
- Low cervical: bilateral, at the anterior aspects of the intertransverse spaces at C5-C7.
- Trapezius: bilateral, at the midpoint at the upper border.
- Supraspinatus: bilateral, at origins, above the scapula spinae near the medial border.
- Second rib: bilateral, at the second osteochondral junctions, immediately lateral to the junctions on upper surfaces.
- Lateral epicondyle: bilateral, 2 cm distal to the epicondyles.
- Gluteal: bilateral, in upper outer quadrants of the buttocks in anterior muscle folds.
- Greater trochanter: bilateral, posterior to the trochanteric prominence.
- Knee: bilateral, at the medial fat pad proximal to the joint line.

Patients have fibromyalgia if the history of widespread pain has persisted for a minimum of 3 months and at least 11 of 18 tender points are painful. Presence of another clinical disorder does not exclude the diagnosis of fibromyalgia. Fibromyalgia is distinguished from other chronic idiopathic musculoskeletal disorders only by the presence of the tender points.

Prevalence and aetiology

Two to four percent of the population suffers from fibromyalgia and ninety percent of patients are women (Forseth et al. 1992, Wolfe et al. 1995). This makes fibromyalgia one of the most common disorders among women. While the onset of pain is most common in mid-life, the disorder can occur

at any age (Wolfe et al. 1990, Vandvik et al. 1994, Goldenberg 1996). A population survey from Norway presents point prevalence as high as 10.5% among young and middle-aged females (Forseth et al. 1992). The disorder is most common in the industrialised countries. Although the aetiology remains unknown, the weight of evidence suggests that fibromyalgia is a chronic pain syndrome with a central rather than peripheral aetiology (Simms 1998, Yunus et al. 1989b, Bengtsson et al. 1989) which would fit well into the consequences of long-term stress (see below).

Researchers have recently discussed how to take FMS patients more seriously in terms of social security issues. More nuanced definition of FMS and new assessment tools such as functional capacity would allow society to provide better help to this patient group (Hadler et al. 2003).

Pathophysiological hypothesis

Stress

FMS patients are vulnerable to stress (Davis et al. 2001). Different systems are involved in the physiology of stress, both the CNS (Central Nervous System) and various peripheral components. These stress systems involve the hypothalamic-pituitary-adrenal axis (HPA axis), the hypothalamic-pituitary-gonadal axis (HPG axis) and the autonomic (sympathetic) system (Anderberg 1999a, Pillemer et al. 1997, Crofford et al. 1994, 1996). Perturbations of the HPA axis and hyporesponsiveness of the adrenal glands are factors seen in fibromyalgia patients which may explain their somatic and psychiatric symptoms. Low 24-hour free cortisol and exaggerated pituitary responses to exogenous CRH (corticotrophin-releasing hormone) have also been described in fibromyalgia patients (Crofford 1998, Griep et al. 1998, Neeck et al. 2000). Stress caused by chronic pain or other stressful events may also result in hypersecretion of CRH and down-regulation of the adenohypophyseal CRH receptors and lead to depression and anxiety (Neeck 2000). Interestingly, the perturbation patterns seen in fibromyalgia have also been found in adult survivors of childhood abuse (Heim et al 2001). One underlying explanation of these perturbations may be a sensitisation of the anterior pituitary and counter-regulative adaptation of the adrenal cortex.

Perturbations of the sympathetic-parasympathetic balance may explain part of the variability of pain seen in FMS patients (Malt 2002).

Neurotransmitters

Other factors which appear to be involved in the pathophysiology of fibromyalgia are perturbations in so-called neurotransmitters and their receptors. Transmitters and neuromodulators appear to be important for processing nociceptive information between peripheral, spinal and central levels in the body. Inhibitory neurotransmitters, e.g. serotonin, have an anti-

nociceptive effect and researchers suggest that fibromyalgia patients exhibit low serum levels of the serotonin precursor L-tryptophan in the cerebrospinal fluid, which may explain the patients' perception of pain (Yunus et al. 1992, Russel et al. 1992). Serotonin also appears to be excitatory to corticotrophin-releasing hormone (CRH) which is released by the hypothalamus and stimulates the pituitary to produce adrenocorticotrophic hormone (ACTH). Prolonged stress, which may lead to perturbations of the HPA axis with subsequent perturbation of serotonin activity and pain-processing peptides, may thus affect the patients both mentally and physically, e.g. in depression where cognition and memory are focused on depressive ideas (Chrousos et al. 1992) and in the perception of pain.

Sensitisation

Sensitisation, which is an increased reactivity to stimuli, may be another mechanism behind the generalised hypersensitivity of fibromyalgia patients to sensory stimuli (Kosek et al. 1996). Researchers are discussing sensitisation as an acceptable pathophysiological mechanism underlying very frequently occurring medical conditions (Ursin 2000). Another form of sensitisation called kindling is defined as a decreased threshold to electric after-discharges released by chemical or electrical stimulation of limbic structures. Kindling may be regarded as time-dependent sensitisation of limbic neurons (Bell et al. 1992). The kindling phenomenon may explain why some patients become more sensitive to certain types of stimuli than others. One part of the brain which appears especially sensitive and vulnerable consists of the amygdaloid nuclei and the central amygdaloid nucleus, which is involved in arousal and emotional activation. It is possible that the comorbidity with psychiatric disorders in patients with fibromyalgia syndrome, for instance anxiety disorders such as panic disorders, is predicated on the kindling phenomenon in limbic structures (van der Kolk 1994).

Autonomic dysfunction

Fibromyalgia has lately been regarded as a syndrome where the autonomic system plays a role. Researchers have discussed fibromyalgia syndrome as having the same autonomic dysfunction as that seen in delayed trauma patients (Scaer 2001). Evidence of an increased incidence of childhood sexual and physical trauma in fibromyalgia patients has been documented (Boisset-Pioro et al. 1995), and traumatic experiences have also been noted (Waylonis et al. 1994). Dysregulation of the autonomic nervous system is a mechanism which in turn leads to impaired ability to respond to stress in FMS (Clauw 1995). Other findings which support perturbations of the autonomic nervous system are the perturbed levels of neuropeptide Y (NPY) seen in FMS patients (Crofford et al. 1994, Clauw 1995, Anderberg 1999a).

NPY co-exists with noradrenalin in the sympathetic nervous system and can therefore be seen as a marker of sympathetic activity.

Activity in the autonomic nervous system is related to the HPA axis and to stress reactions (Chrousos et al. 1992, Chrousos 1998). Autonomic nervous system reactions have been found to be interrelated with the patient's coping strategies (Sivik 1995).

Personality and psychological factors

Personality

Neuroticism or neurotic behaviour refers to a chronic condition of distress in emotional individuals reacting to various types of stimuli (Epstein et al. 1999). High neuroticism is characterised by an inability to change behaviour between states and to readapt to baseline levels after physiological stress responses. This type of behaviour occurs in a high percentage of FMS patients and its association with fibromyalgia has been discussed by researchers (Epstein et al. 1999, Malt 2002).

In addition, high scores for somatic anxiety, muscular tension and psychasthenia have been found in fibromyalgia patients (Ekselius et al. 1998) as well as a high degree of harm avoidance (Anderberg et al. 1999b) and mutilation anxiety (Malt 2002). It thus appears that many FMS patients experience a high degree of anxiety, tension and inner stress, in part most likely due to personality factors.

There are different hypotheses with respect to the correlation of unexpressed emotion and affects to chronic pain. Beutler et al. (1986) discuss the possibility of prolonged blocking or inhibition of intense interpersonal anger as a common correlate of chronic pain. Blocked and suppressed emotional experiences that coincide with prolonged stress may also result in deactivation of the body's production of endogenous opioids and natural killer cells, which are associated with pain (Beutler et al. 1986). Individuals with a pattern of emotional rigidity and over-control may be good candidates for a therapeutic regimen which emphasises the focused and directed expression of inhibited emotions, particularly those within the anger spectrum. Treatments that help patients cope with intense negative affects may be recommended for chronic pain patients. Beutler et al. (1986) postulate that substances which may serve as analgesics, such as endogenous opioids, may be activated by focused arousal of unwanted emotions directed at a specific target within an appropriate interpersonal response.

Alexithymia

Alexithymia has been associated with fibromyalgia and chronic pain (Papciak et al. 1986, Sivik 1993, Lumley et al. 1997,) and is a concept that was introduced by Sifneos (Sifneos 1973). Taylor et al. (1991) has described

the clinical features of alexithymia as difficulties in verbalizing and recognizing feelings; as an endless description of physical symptoms instead of emotions, thoughts and speech tied closely to external events. Alexithymia can also be defined as an inability to talk and think about feelings and an inability to process feelings mentally (Konarski 1991). Diagnostic criteria for alexithymia were presented in 1995 (Fava et al. 1995) and the use of interviews was recommended instead of self-rating scales in the diagnosis.

In a neurophysiological perspective, complex processes are active in the mind when we think, perceive and feel. The aetiology of alexithymia is found in the link between the limbic and hypothalamic system where hormonal and nervous systems are integrated (Ursin 1995). Lack of information from the limbic system to the brain stem leads to a decreased amount of feelings and fantasies and an inability to symbolise. The autonomic system starts to trigger vegetative reactions in organs without activating the brainstem. The alternative is now to communicate feelings sensorimotorically instead of using verbalization. Anxiety, affects and emotional conflicts are expressed by the body in a somatic “body language” (Lerner 1999).

Alexithymic individuals show lack of gestures and other expressive movement patterns. The result can be rigid body positions and gestures without expressions. Patients with alexithymic problems may be unaware of body reactions following affects and interpret these reactions as symptoms of sickness (Schiöler 1989). From childhood we all have the experience of being in a non-verbal biological mental state where stimuli are perceived through sensory and vegetative signals which are interpreted from the caregiver (Sivik 1995). Coping strategies are established through these signals and emotions. This is the base on which adults build their mental, verbal and abstract cognitive representations of the links between sensation, feelings and thoughts. Sensory input may therefore be seen as an expression of different needs, emotions and mental states (Sivik 1995).

New methodological studies are clarifying the relationship between alexithymia and psychopathology and the extent to which alexithymia can predict treatment outcome. This research has broadened considerably in recent years (Taylor et al. 2004). Optimal parenting has lately been discussed as a factor that may protect against development of alexithymia (Kooiman et al. 2004). Recent studies have also shown that alexithymic patients have difficulty recalling their dreams, compared to non-alexithymic subjects (De Gennaro et al. 2003).

Life events

Negative life events in childhood have been reported in groups of fibromyalgia patients (Anderberg et al. 2000a) and may be of importance in the development of FMS (Katon et al. 2001). From the literature we know

that fibromyalgia patients are subject to many traumatic life events, both in childhood and as adults (Boisset-Piolo et al. 1995, Walker et al. 1997 a&b, Anderberg et al. 2000a) and it is possible that these physical and mental memories still affect the patients. Somatic and psychosomatic symptoms such as pain and stiffness and/or psychological symptoms such as depression, lack of concentration, lack of self-confidence, and anxiety are commonly mentioned by fibromyalgia patients and may be the result of such events. Recent studies (Schmeil 2004) have shown that victims of e.g. violence find it difficult to verbalise overwhelming emotions and somatic symptoms, and Creative Arts therapies have been discussed as a possible treatment.

Creative Arts therapies

Together with music, art and psychodrama therapy, dance/movement therapy is included in the Creative Arts therapies (Theorell et al. 1998 a&b) which are distinguished from other modes of therapeutic practice by their emphasis on bodily expression. The body sings, speaks, dances and enacts scenes in order to find expression for different emotions and bring them into play. This is what enables the arts to achieve therapeutic effects (Levine 1996). Words alone are not always enough to express an experience. The arts may help us to say what we can not express in words.

Many researchers have long argued that Creative Arts therapies, among them dance/movement therapy, may be an important complement to other forms of therapy and pharmaceutical treatment in patients with long-standing and chronic pain (Grönlund et al. 1991, Tetzary 1991, Grönlund 1994, Meyer 1999, Arn 1999). Creative Arts therapies are effective in promoting an emotional state of well-being and helping the patient create symbols that represent emotional experiences. Application of these therapies may also lead to increased self-esteem, physical mobility and self-control (Hanna 1995). The act of creating symbols for emotions, especially those grounded in negative life events, reawakens suppressed emotions and also helps the patient deal with them (Hanna 1995).

Creative Arts therapies are one of the therapeutic modalities that are suitable for patients with psychosomatic disorders related to alexithymic problems, difficulties in differentiation of feelings, or inability to symbolise (Theorell et al. 1995, 1998). Sifneos (1967), who first placed alexithymia on the map, even suggested that verbal therapies could be contraindicated in alexithymic disorders. According to McDougall (1990), sickness can be canalised into somatic dramas where symptoms are originally psychological dramas. Non-verbal expressions are one way to cope with psychological as well as physical pain and mental conflicts.

Dance/movement therapy

Dance is known to have been a natural part of every life and every culture as far back as records go. The meaning and metaphors of dance have been subject to discussion and change over time. The healing aspects of dance also vary with time. The modality of dance/movement therapy (DMT) had its beginnings in the USA in the 1940s (Levy 1992). The fundamental premise of DMT is that mind and body are inseparable. What is experienced in the mind is also experienced by the body (Levy 1992).

Since the 1940s, dance/movement therapists have developed methods for clinical use with patients representing most areas of healthcare.

Several papers have presented dance/movement therapy as a treatment model for non-pain, chronic pain and psychosomatic patients, and for those suffering from cancer or dementia as well as incest survivors (Lewis et al. 1995, Ambra 1995, Theorell et al. 1998b, Cohen et al. 1999, Boris 2001, Ellis 2001, Nyström 2002). Research has shown that dance/movement therapy can be viewed as entirely comparable to other psychotherapeutic and medical treatment modalities (Cruz 1998). Meta analyses of the effects of verbal psychotherapy (Smith et al. 1977), cognitive behavioural therapy (Barker et al. 1988) and exercise programmes for psychological problems (North 1989) are compatible with effects of dance/movement therapy (Ritter et al. 1996).

The American Dance Therapy Association (ADTA) was established in 1966. The definition of DMT (from 1998) is:

“Dance movement therapy is the psychotherapeutic use of movement as a process which furthers the emotional, cognitive and physical integration of the individual”.

Dance/movement therapy includes various dimensions of a physical, emotional, cognitive and cultural nature. Several researchers argue that through dance, patients can develop an increased sense of self-control which in turn can lead to reduced feelings of helplessness and anxiety; feelings that can contribute to reduce the state of stress as well as the experience of pain (Hanna 1987, Berrol 1992, Hanna 1995, Thulin 1995, 1998, Grönlund et al. 2004). There has so far been no research into how and in what way stress hormones react on these personality changes after dance/movement therapy.

The language-like quality of dance movements can be used to express ideas and feelings such as anger and fear from the past and present, both at the conscious and unconscious level (Hanna 1987, Hanna 1995). The patient's own interpretation of body language and movements after dance/movement therapy has not previously been reported in the literature.

The dance/movement therapy group

DMT can be practiced individually or in a group setting. Schmais 1998 presents certain stages for group therapy in the context of a dance/movement therapy process which may help a therapist move the group towards its goals. These stages are “affiliation”, “differentiation”, “intimacy” and “separation”. “Affiliation” is a warm-up stage where the external boundary of the group system is established. The stage of “differentiation” includes the group members’ exploration of their differences and the testing of boundaries. This is followed by the “intimacy” stage which involves understanding and room for differences and where group members become more open and trusting. Finally there is the “separation” stage which involves issues of termination and separation from the group and the therapist and evokes struggles of coping and the anxiety of separation (Schmais 1998).

Music and rhythm

In group therapy, rhythm may help to stimulate and organise the individual’s behaviour and bring the patient in step with others (Schmais 1985). Music and rhythmic movement may bring both quantitative and qualitative aspects to the behavioural response (Berrol 1992, Stanton-Jones 1992). Rhythm serves as a good means for channelling emotions, and its sensory impression may have a deep psychological influence. Rhythmic sounds tend to draw resistant patients into participation and may also act as a safety valve for feelings (Levy 1992). Emotional perception of music has a significant effect on autonomic responses, e.g. changes in pulse rate, blood pressure and galvanic skin response (Harrer et al. 1977), and music is also capable of expressing and affecting feelings and attitudes (Arrington 1954). Studies on music moreover indicate that the pain perception threshold increases while subjects listen to music (Schorr 1993, O’Callaghan 1996). Whether this is related to emotional perception of the music without affecting the patient, or to emotional induction which means that the patients do respond emotionally to the music, is subject to debate among leading researchers (Gabrielsson 2002). Dance/movement therapists often use music as a mediator of structure and security, but also to trigger the imagination.

The context decides whether it is dance/movement therapy or music therapy (Bojner Horwitz 2004a). Researchers have lately discussed what it is that makes people react to music (Frith 2004). It would seem that the social circumstances are more important than the music itself. The quality of the social experience, people’s expectations and their perception of musical functions determine the musical experience. Liking or disliking music is a social and individual activity, and musical taste involves social factors with all their attendant emotional baggage (Frith 2004). The emotional experience of music also appears to be similar among musicians and non-musicians (Schubert 2001).

Psychological theories

Dance/movement therapy has been influenced by various forms of theoretical work. As an example, Sigmund Freud's (1856-1939) work with free association can be applied to free improvisation in dance/movement therapy because the body reveals the inner processes of the body (Freud 1995). Carl Gustav Jung (1875-1961) stated that feelings that are not expressed in words can be symbolically expressed in pictures, music and dance (Lewis 1986).

DMT has also been influenced by Charles Darwin's work on the association between emotion and thought. The theories and work of Darwin are today integrated into modern affect theory where biological and psychological aspects of the human being are regarded as a whole: a psychobiological model. Affects are innate feelings that are not yet being experienced consciously. Affects are a link between the body and the psyche. According to the affect theory, feelings are regarded as motor expressions which are closely interlinked (Havnesköld et al. 1995). Silvain Tomkins were talking about the affect as a border phenomenon between the body and psyche (Havnesköld et al. 1995). From the psychoanalytical work of Wilhelm Reich, theories about body expression revealing ongoing inner processes have been used in DMT. Reich states that muscular tension and suppressed emotions are parallel symptoms of the same entity (Reich 1972).

Another psychoanalytical work by Joyce McDougall (1990) discusses body functions as non-verbal phenomena. Small children react somatically to emotional pain. When adults react somatically to emotional stress, this is also a non-verbal reaction more fundamental than words. Therefore it is difficult to use words to eliminate the emotional processes involved.

That the creation of identity is built up through creativity was something central to D.W. Winnicott (1896-1971), who also created the expressions "play-space" and "intermediate area" (Winnicott 1997).

Paul Schilder (1886-1940) introduced the concept of body image and defined it as "the picture of our own body which we form in our mind, that is to say the way in which the body appears to ourselves" (Schilder 1970, pp. 11). He also said: "motion influences the body image and leads from a change in the body-image to a change in the psychic attitude" (Schilder 1970, pp. 208). Those quotations have often been used to support a therapeutic understanding of dance/movement therapy.

Judith Kestenberg (1975), psychiatrist and psychoanalyst, developed the concept of "attunement" between the baby and the mother which is comparable to kinaesthetic empathy. Unsynchronised rhythm may hamper the psychodynamic growth of a child (Levy 1992). Therefore the concept of attunement is important when working with dance/movement therapy.

The non-verbal researcher Birdwhistell believes that body movements are learned from the cultural context that we live in (Birdwhistell 1970). The

interpretation of body movements must involve the full context of the individual and has no meaning in itself. In a socio-cultural perspective, movement can be regarded as the first symbolic form of communication between people (Moore et al. 1988).

According to Stern, in our culture we consider words more important and meaningful than body language (Stern 1985). We do not need to take the responsibility for our body language because it is unconscious.

In conclusion, the theoretical foundation which underlies the therapeutic goals of dance/movement therapy may be summarised in the following five theoretical principles (Stanton-Jones 1992):

1. The body and mind are in constant reciprocal interaction, and changes that occur on a movement level can also affect the total functioning.
2. Movement reflects personality which includes psychological developmental processes, psychopathology, and expressions of subjectivity and patterns of relating to other people.
3. The relationship between patient and therapist is essential for the effectiveness of the approach.
4. Movements as seen in dreams, drawings and slips of the tongue can be evidence of the unconscious.
5. The act of creating a movement through improvisation is inherently therapeutic. It generates new ways of moving which gives the patient new experiences of being in the world.

Examples of how the referenced theoretical frames and other psychological theories may be practiced and implemented in the processes of dance/movement therapy can be found in different research reports and publications, e.g. Levy 1992; Grönlund 1994; Thulin 1995, 1998; Grönlund et al. 1999; and Nyström 2002.

Movements and affects

Researchers have discussed the link between movements and affects (Marsden 1986, Berrol 1992). The so-called “motor loop” is explained as controlling movements, and the so-called “limbic loop” as controlling emotions. Different areas of the basal ganglia integrate thoughts and emotions into motor behaviour (Marsden 1986). Schilder 1970, points out those changes in body image result in shifts in mental attitudes which in turn may spark alterations in muscle tension. He also declares that “every emotion expresses itself in the postural model of the body and that every expressive attitude is connected with characteristic changes in the postural model of the body” (Schilder 1970, pp. 209). According to Schilder, DMT is an example of an emotion-motion phenomenon: for instance, when sadness

is expressed, the muscles loosen and when anger is expressed, muscular tension heightens (Berrol 1992).

Other examples of the link between movements and affects are presented by other researchers. They point to the frontal lobes as the key to cognitive, physical and emotional doors throughout the brain and especially the connection between the limbic system and the frontal lobes. Frontal lobe impairment involves alterations in affects and in cognitive domains and movements (Luria 1970).

Function is dependent upon neural communication between various areas of the brain. A disruption in any one area affects multiple behaviours. Disruptions are manifest in both motor and behavioural responses; both in soma and psyche (Berrol 1992). Studies therefore emphasise the importance of neurochemical factors in all human behaviours (Kolb 1985). Seeing DMT in a healing perspective, Berrol (1992, pp.28) concludes that:

“...viewing the human body as the vessel or container, and rhythmic movement as the medium, the receptor systems – kinaesthetic, proprioceptive, vestibular, auditory, visual – can be systematically manipulated for therapeutic ends. Movement can serve as a mediator, intervening to organise and/or reorganise the neurological underpinnings of cognitive, physical and emotional function to facilitate behavioural change and enhance well-being”.

Video in/as therapy

Video has been used clinically in different settings, especially behavioural situations, in order to observe processes. Within eating disorder research, video has also been used to capture body size and attitudes towards bodies. Researchers have also transcribed text from video viewing patients in different settings in order to capture information about certain phenomena (Peolsson 2001, Ekman 1993). In dance/movement therapy, video has most commonly been used to capture the therapeutic process for post-therapy analysis (Grönlund 1994, Grönlund et al. 2004). However, the patients' own perception of video viewing has not been used, and in the area of FMS, video and video interpretation which focuses on the patient's self-perception has not previously been presented.

Video interpretation technique

The recently developed video interpretation technique presented in this thesis was developed as a method for measuring changes in self-perception among fibromyalgia patients and to measure changes in patient movement patterns during a treatment process. Pain behaviour consists of several

components including physical, cognitive and affective (Turk et al. 1997) and researchers have shown that it is difficult for an observer to judge the motor functioning of a FMS patient (Hidding et al. 1994). Video interpretation technique addresses these problems by letting patients assess their own condition using video recordings. To let fibromyalgia patients assess their own movement pattern from video is a new way of evaluating changes over time before and after treatment. Other studies justify the therapeutic need of the video interpretation technique by its ability to strengthen the patient's self-esteem (Johnson et al. 1997), helping patients accept their new self-image (Hellström et al. 1999), and enhancing the patients' feelings towards themselves (Gaston-Johansson et al. 1990).

Self-perception

The perception of the self as being "healthy" or a "non-pain person" is a central and crucial step in treating a chronic pain syndrome (Large et al. 1990). Self-perception and self-construct are key variables to measure when helping patients with chronic pain. There are clinical indications that FMS patients suffer from poor body image and difficulties in interpreting sensations and body signals, although this has not been proven scientifically. Body image and self-perception analyses may therefore help FMS patients become aware of different body signals and body symptoms by discriminating feelings and emotions and helping them detect not only a poor, but also a rich sense of well-being. In order to understand the process involved when FMS patients assess their body movements and how visual stimuli affect their condition, explanatory models and terms have been found within eating disorder research (Lacey et al. 1986, Dworkin et al. 1987, Cumming 1988, Warah 1989, Lautenbacher et al. 1992, Lautenbacher et al. 1997).

If we consider Schilder's definition of self-image as the picture of our own body which we form in our own mind (1970), this picture may have consequences for our health. From research we know that the self may form our opinion of ourselves, and only when we are aware of discrepancies between our current state and the state we wish to attain can we engage in behaviours that reduce the discrepancies (Kihlstrom et al. 1999). How we see ourselves when we are in pain, and how our self-perception may change our condition, were questions that led to development of the video interpretation technique.

Drawing in/as therapy

The therapeutic use of art and drawing was first developed by psychiatrists and psychologists in Europe: in France mostly by Freudian, and in Switzerland mostly by Jungian analysts (Jacob et al. 1992). A movement subsequently developed in the United States where Art Therapy is provided by specially trained therapists, and the method is today well established world-wide. The attitude of artist painters and psychiatric patients differ in one aspect. Modern painters let their emotions guide their hands and see later what the production will become. Patients treat their art products as if they had a life of their own (Jacob et al. 1992).

As an instrument for evaluating chronic pain, improvised pictures have until now rarely been evaluated scientifically. Pain drawing tests where patients mark the characteristics of their pain on a drawing of a human body have nevertheless been evaluated e.g. in patients with low-back pain (Sivik 1992). Interestingly, a Swedish thesis has shown that communication of arts stimulation may affect well-being both mentally and somatically (Wikström et al. 1993). Art may therefore be regarded as a therapeutic instrument as well as an assessment tool.

Human figure drawing

Much research has been conducted on graphic work which represents the human body. This research has resulted in the Human Figure Drawing developed by Machover and subsequently modified by Koppitz, which is used as a projective technique for the study of personality (Jacob et al. 1992). Koppitz believed that the Human Figure Drawing reflects people's attitudes toward their bodies and themselves (Offman et al. 1992, Morin et al. 1998). The Human Figure Drawing (Goodenough 1926) is used when assessing intellectual ability in a developmental perspective. The amount of body detail in the Human Figure Drawing decreases as cognitive function diminishes. Several essential details in the Human Figure Drawing are necessary for the definition of a human figure. These details are the head, two eyes, nose, mouth, two arms and two legs (Buck 1966). Today, the Human Figure Drawing is used in screening for dementia in the elderly and also to determine memory function across the adult life span (Ericsson et al. 1997, 2001, Wang et al. 1998).

Self-figure drawing

Self-figure drawings have previously been used in the analysis of paintings by patients in psychiatric settings (Hacking et al. 1996, Collis 1999) and have been developed from the Human Figure Drawing. A number of variables in the drawings differ between non-patients and patients e.g. colour, space covered and quality of line (Hacking et al. 1996). Other

methods within the projective drawing family are DAP (Draw a Person) and KDF (Kinetic Family Drawing), which are used in children and are significantly correlated with self-reported self-concepts among children (Tharinger et al. 1990, Matto 2002). Self-figure drawings have been used in clinical practice to detect the treatment effects of dance/movement therapy, but are still not proven scientifically. While different approaches have been used to analyse drawings, they remain difficult to validate. Scanning techniques using the number of kilobytes (kB) needed for the scanning as a quantitative measure, may be one method which has not been presented in the literature (*Paper II*).

Aims and hypothesis

The thesis has the following aims:

The principal aim of the study was to determine whether and how the hormonal, emotional, physical and visual status changes in female fibromyalgia patients following treatment with dance/movement therapy, compared to a control group of female fibromyalgia patients. Part of the principal aim was to present two assessment methods, the “video interpretation technique”, and the “self-figure drawing” in order to see how fibromyalgia patients perceive themselves on video and how the therapist perceives the patients from their drawings. The video interpretation technique has been analysed using both a quantitative and a qualitative method. The study also aimed to detect possible differences between verbal, visual and hormonal analyses.

Specific aims:

Paper I: Is it possible to find corresponding changes in stress-related hormones and movement patterns (measured by video interpretation) in female fibromyalgia patients after dance/movement therapy?

Hypothesis: If patients measure changes in their movement patterns positively after dance/movement therapy, it is possible that stress-related hormones may mirror these changes, and that patients’ body movements are a source of information about inner biological processes and treatment effects after DMT. This could make it easier for the therapist to determine status and treatment outcome by analysing the patient’s body language.

Paper II: Is it possible to detect differences between verbal, visual and hormonal assessments after treatment with dance/movement therapy in fibromyalgia patients? Is it possible to identify changes in self-figure drawings after DMT compared to the control group? Self-figure drawings and the video interpretation technique were the assessment methods used.

Hypothesis: If verbal, visual or hormonal aspects play a role in measuring the effects after treatment with the Creative Arts therapies, dance/movement therapy; it will impact the outcome of the therapy. Somatic components are

still rarely used in evaluation techniques after Creative Arts therapies and may be a good complement to established verbal instruments.

Paper III: The aim was to interview female fibromyalgia patients about their thoughts after they had viewed themselves on videotape. The phenomenon under scrutiny was self-perception of video viewing.

Hypothesis: If we could learn to understand how fibromyalgia patients think about themselves, we could jointly with the patients help them understand their needs and find more effective treatment tools. For many fibromyalgia patients, verbal therapies may not work out well due to alexithymic problems and strong defence mechanisms. Letting patients view and then verbally interpret themselves from videotape may therefore help them gain insight along with more conscious perceptions of their bodies. This may also lead to more specific and effective treatment programmes.

Paper IV: The aim was to present the video interpretation technique and to investigate whether and how visual stimuli, as detected on videotape, affect female fibromyalgia patients' assessments of their own condition. As part of the study, patients received treatment in the form of dance movement therapy.

Hypothesis: As it is difficult for an observer to judge the function of an FMS patient, the video interpretation technique may help the therapist and patient assess conditions following treatment and may also increase the patient's perception of herself. If the patient is affected by viewing the videotape, the video interpretation technique may be used as a therapeutic instrument and to measure qualitative and quantitative changes in the patient's body movements after treatment with dance/movement therapy.

Today, there is uncertainty as to how the functional disability of FMS patients should be measured e.g. in the context of social security issues. The VIT may facilitate verification of the patient's functional status by means of the patient's own assessments at different stages of treatment and disease development.

Material and Methods

Subjects

In papers I and II, thirty-six female fibromyalgia patients participated. Mean age was 57 years (SD 7.2 years) and the mean duration of the disease was 7 years in the treatment group and 8.7 years among controls. Pain duration was much longer in both groups (>12 years). The patients were randomised into either dance/movement therapy (20 patients) or a control group (16 patients). 20 patients were randomised to the treatment group to secure sufficient evaluated numbers of patients. The randomisation schedule was generated in one block and kept blind to the administrator until patients had been allocated to their groups. The duration between first-patient-in and last-patient-in was one week. Two patients dropped out early in the study for personal reasons; one from the treatment group and one from the control group.

In paper III, eight female fibromyalgia patients were randomised from study IV. Mean age was 46 years (SD 5.6 years).

In paper IV, fourteen female fibromyalgia patients participated. Mean age was 43 years (SD 7.5 years) and the duration of the disease was between six months and six years.

All patients were consecutively recruited from ambulatory care rheumatologists within the Stockholm Rheumatological District. All of the patients met American College of Rheumatology (ACR) criteria for FMS (Wolfe et al. 1990). For inclusion and exclusion criteria see below.

All patients received oral and written information about the design of the studies and gave their consent to participate in the studies before being randomly assigned. The patients could withdraw their consent at any time during the study period. Two approvals were obtained from the Regional Research Ethics Committee of the Karolinska Institute in Stockholm, Sweden with respect to *papers I, II* (ref. No. 00-440) and *papers III and IV* (ref. No. 98-008).

In papers I and II the exclusion criteria were patients with (a) difficulty speaking or understanding Swedish; (b) serious angina pectoris; (c) a history of stroke; (d) alcohol or drug abuse; and (e) patients with severe depression. Other exclusion criteria were treatment with (f) TENS; (g) powerful analgesic or antidepressant drugs; (h) other psychotropic drugs; (i)

psychotherapy; or (j) undergoing regular acupuncture. During the study period, two patients (one from the treatment group and one control) dropped out after one month for personal reasons.

The control group did not participate in the dance/movement therapy during study time. Nevertheless, the control group was invited to participate in a DMT treatment after the completion of the study. Both treated and controls continued with their ordinary way of coping with their disorder i.e. making walks, swimming etc. although they were not allowed to start any new treatment during the study time.

In papers III and IV the inclusion criteria were patients (a) with normal vision with or without eyeglasses, as all patients were required to interpret themselves on video. Exclusion criteria were patients (a) with comorbid physical or psychiatric disorders; (b) treatment with powerful analgesics or (c) undergoing verbal or non-verbal psychotherapy. Four patients were treated with an antidepressant drug for pain relief. There were no changes in treatment regimens during the study period. During the study period (*in paper IV*) one patient dropped out after 2 months for personal reasons.

Treatment method

Description of the dance/movement therapy method

The DMT method used in *paper I and II* was composed of four major themes, each comprising four separate sub-themes. The four major themes were:

- Awareness of the body, room and group
- Movement expressions/symbolic quality of movement
- Movement/feeling/image/word
- Differentiation of feelings/integration

Each of the four major themes comprised four separate sub-themes:

- Setting limits, outer/inner, personal space
- Body language, reflecting process, polarity, expression outward/inward
- Playing, drawing, verbalization
- Inner sense, quality of movement, expression of feeling

Four of twenty dance/movement therapy sessions (Nos. 4, 9, 14 and 19) representing each of the four major themes were video recorded for future presentations of this method. Each of the referenced concepts, e.g. symbolic quality of movement, differentiation, personal space, polarity and

integration, have been previously presented in various research reports and in the literature (Schmais 1985, Levy 1992, Stanton-Jones 1992, Grönlund 1994, Grönlund et al. 1999, Nyström 2002, Meekums 2002).

The DMT model is constructed on a bio-psycho-social basis, which means that neurobiological, psychological and social components are involved in the process. DMT is an active process where the focus is on the body. It is the body which dances, draws and speaks. All therapy sessions involve both verbal and non-verbal processes. According to Schmais (1981), movement alone is not enough in the DMT process. The use of words to link thoughts and actions distinguishes DMT from pure dance. Four separate stages are involved in the dance/movement therapy process according to Schmais (1998) – affiliation, differentiation, intimacy and separation – where the different themes can be approached (*see papers I and II*).

The objective of the dance/movement therapy was to improve both physical and psychological function and to find new and better ways of coping with the FMS disorder. A psychodynamic approach has been used, which views the patient in a psychoanalytical model of personality development. Childhood experiences and unconscious feelings are assumed to be central. This dance/movement therapy experience starts with inner sensing where symbols (conscious and unconscious) arise from movement and from words in order that unconscious ideas and feelings can be brought to awareness and lose their hold on the personality. Transference phenomena are not worked through on a deeper level in the sense that regression and reconstruction are analysed. The transference is lived through the patient's movements and behaviour and in their relationship to each other and to the therapist. With the aid of a verbal therapist and through personal dance/movement sessions, the therapist worked through the transference material arising from the dance/movement therapy process.

The treatment group (20 patients) was randomly divided into two groups (of 10 patients each) and participated in one-hour dance/movement therapy sessions weekly for 6 months. The subjects in the control group did not participate in the treatment but were invited to use this therapy after the study was completed. A detailed description of each dance/movement therapy session will be found in Bojner Horwitz 2003 (in manuscript).

Music selection

Music was used in the dance/movement therapy sessions and the patients voted on desired music genres, with the majority deciding the choice. Five different genres of music were presented: pop, instrumental, classical, folk music and rhythmic world music. The patients chose rhythmic world music for use in 17 sessions out of 20. In three of the sessions, classical music was used.

Examples of rhythmic world music choices:

- Feet in the soil, Volume 2, New Earth Records, 1998
- Feet in the soil, James Asher, 1997
- Brent Lewis, Pulse, Mauma Records, 1995
- Brent Lewis, Rhythm Hunter, Mauma Records, 1996

Example of classical music choice:

- Wagner, Tannhäuser, “Overture”
- Rachmaninov, Piano Concerto No. 2, op. 18

Evaluation

Hormone analyses

Blood samples were obtained in order to assess serum concentrations of the hormones prolactin, dehydroepiandrosterone sulphate, cortisol, cortisol in saliva and neuropeptide Y (*paper I, II*).

Cortisol increases with mental and physical activity. However, during prolonged stress, distress and in post traumatic stress disorder, the concentration of this hormone decreases (Chrousos et al. 1992, Yehoda et al. 1994). Regulation of the blood concentration of cortisol is perturbed in alexithymia (Hyypä et al. 1990).

Dehydroepiandrosterone sulphate (DHEA-S) is an adrenal hormone (de la Torre 1994). High levels reflect well-being (anabolism). Good psychosocial circumstances also generate an increase in this hormone (Arnetz et al. 1983, Theorell et al. 1998a). Increased levels of DHEA-S have also been seen in patients with PTSD (Sondergaard et al. 2002, 2003).

Prolactin is an anterior pituitary hormone which mirrors the serotonergic and dopaminergic systems in the central nervous system. The concentration of this hormone increases in situations of loss of power or crisis (Theorell 1992). Griep et al. (1993) has found inter-individual variations in prolactin levels in FMS. Low baseline levels have been seen in patient groups with low empathetic ability and a high baseline level in traumatised patients with emotional hypersensitivity (Sivik 2004).

Neuropeptide Y (NPY) is a neuropeptide involved in the perception of pain, blood pressure and weight (Munzlani et al. 1996) through both central and peripheral mechanisms. NPY may also be involved in the sympathetic nervous system and may therefore be regarded as a marker of stress (Anderberg 1999c).

All blood and saliva samples from patients and controls were taken in the morning at the same time between 9.30 and 10.00 a.m. in a laboratory in Stockholm. The blood samples were collected in chilled EDTA tubes and immediately centrifuged at 2000 * g (Megafuge 1.0 R. Heraeus Instruments) for ten minutes. The sera were collected in mini-sorb tubes and kept frozen at -60°C before thawing and direct analysis by radioimmunoassay (RIA). This description applies to all the hormones/peptides. Of the 36 patients and controls, 35 were postmenopausal and menopausal status was therefore not used as a variable in subsequent analyses. The hormone analyses were performed a few days before or after answering the questionnaires.

The stress hormone cortisol is secreted from the adrenal glands and released into the circulation where it is bound to globulin. Free cortisol appears in saliva, and both bound and free cortisol is found in plasma. Cortisol levels in plasma correlate well with cortisol levels in saliva (Lundberg 2002).

Questionnaires

Over the course of the investigation (*papers I and II*) (14 months), data were collected on the following measurements in both the treatment and control groups.

In studies I and II, these items were calculated at baseline and at the end of months 4, 6 and 14.

MADRS (Montgomery Åsberg Depression Rating Scale) (*papers I, II*)

MADRS is a depression rating scale consisting of nine items scored from one to six. The following items were included: reported sadness, inner tension, reduced sleep, reduced or changed appetite, concentration difficulties, lassitude, inability to feel, pessimistic thoughts and suicidal thoughts (MADRS; Montgomery et al. 1979).

CPRS (Comprehensive Psychopathological Rating Scale) (*papers I, II*)

CPRS is a self-rating scale for depression and anxiety states including 20 different items scored from 1 to 6 according to strict verbal definitions (Svanborg et al. 1994). Items include reported sadness, inner tension, reduced sleep, reduced or changed appetite, concentration difficulties, somatic anxiety, compulsory thoughts, phobias, lassitude, inability to feel, pessimistic thoughts and suicidal thoughts. Total scores of these items were measured at baseline and at the end of months 4, 6, and 14.

SOC (Sense of Coherence) (*papers I, II*)

Sense of coherence represents an individual's capacity for coping with life-stressors and is defined by Antonovsky (its originator) (Langius 1995).

In this study, the scale was translated from Antonovsky's original questionnaire and tested by A. Langius and H. Björvell 1987. The questionnaire consists of 29 items, and scores were graded 1–7. Total scores of these items were measured at baseline and at the end of months 4, 6, and 14.

SSP (Swedish Universities Scale of Personality) (*papers I, II*)

The scale consists of 91 questions involving the following 13 items: somatic trait anxiety, psychic trait anxiety, stress susceptibility, lack of assertiveness, impulsiveness, adventure seeking, detachment, social desirability, embitterment, trait irritability, mistrust, verbal trait aggression and physical trait aggression. Patients mark one of the following alternatives: highly appropriate, appropriate, almost appropriate and not at all appropriate. The scale was developed and standardised by a group in Sweden (Gustavsson et al. 2000). Total scores of these items were measured at baseline and at the end of month 14.

Life Events (*papers I, II*)

This self-rating questionnaire includes questions concerning negative and positive life events. Three different degrees of impact of the events were noted: negative, neutral and positive. The instrument gathers information from three different periods in the FMS patient's life: during childhood and adolescence, during adulthood and ten years before onset of the disorder. The questionnaire comprises of 21 items concerning adulthood and 10 items covering childhood (Anderberg 1999a, Anderberg et al. 2000b).

VAS (Visual Analogue Scale) (*papers I, II*)

In this study we used the VAS scale to detect intensity of pain during the treatment process and at follow-up after 8 months. The VAS scale requires the patient to enter a cross on a line extending from 0 to 100 mm, anchored by "no pain at all" and "worst imaginable pain". All patients recorded their pain on four separate occasions: at week one, month 4, month 6 and month 14 after the start of therapy. Patients were asked to record their entries at the same time of day. The weekly VAS has been used previously in fibromyalgia patients (Anderberg et al. 2000c).

Global assessment of well-being and pain (*paper II*)

Global ratings of well-being and pain took place after completion of the study at 14 months. The questionnaire employed a five-point categorical scale and patients were asked to record changes in these two variables as compared to baseline. The following alternatives were offered: markedly increased, increased, unchanged, decreased or markedly decreased. Patient marked the alternative that best corresponded to their situation. This scale was used to evaluate the effect of dance/movement therapy after 8 months of follow-up.

Ranking dance/music and drawing (*paper II*)

Patients in the treatment group were asked to evaluate which of the modalities dance, music and drawing they perceived as having had the strongest influence on them during the dance/movement therapy process. Patients had to rank the modalities where 1 represented the strongest influence, 2 represented the second strongest and 3 the third strongest.

Video interpretation technique

Video interpretation is a method adapted for fibromyalgia patients to measure changes in their self-perception as well as changes in movement patterns over time after dance/movement therapy. Do motor functions change in chronic pain patients after this Creative Art therapy? Over the years, the method has come to play a quantitative, as well as a qualitative and therapeutic role. The quantitative role is explained in *papers I, II and IV* while the qualitative and therapeutic role is explained in *paper III*.

Technical data and information

Patients were videotaped individually before and after a treatment period. The patients were told to perform the same movement sequences in the video recordings. The movement sequences were easy to learn and functional.

The first sequence moved from a standing starting position to sitting on a chair and back to a standing position.

The second sequence moved from a standing starting position to a position lying on the floor and back to a standing position.

The third sequence moved from a standing starting position into the following sequence: hands to the floor, hands on knees, hands on hips, hands on shoulders, arms up and extended, adduction of arms, abductions of arms, hands to shoulders, hands on hips, hands on knees, hands to floor, and back to the starting position.

The patient interpreted herself as she appeared in the videotapes and used a five-point scale to indicate whether and how her mobility, movement pain and life energy had changed over time. These three variables are often used by fibromyalgia patients in clinical care and represent several aspects of the patient's condition. Life energy is a term often used by fibromyalgia patients to describe how their condition has affected both their emotional and physical states.

The five-point scale consisted of the following grades:

- Markedly decrease
- Decrease
- Unchanged
- Increase
- Markedly increase

The patients were asked to complete the same questionnaire and rate mobility, movement pain and life energy both before and after viewing the tapes. The video interpretation gave patients a retrospective view of their movement patterns prior to treatment, as well as after treatment and follow-up. Patients were asked the following questions with baseline as reference:

1. What is your current perception of your mobility?
2. What is your current perception of your movement pain?
3. What is your current perception of your life energy?

Of these variables “life energy” has been the hardest to define and in this thesis, both emotional and physical states are involved in the definition as used by the FMS patients and in relation to the patient’s condition.

The patient was seated on a chair two metres from the screen on which the videotape was being presented in black and white without sound.

Self-figure drawing

The self-figure drawing data used in *paper II* was collected individually both in the treatment and control group at baseline, after 6 months and after 14 months. A sample of 48 drawings from the study population was taken in order to evaluate the responsiveness of this non-verbal method. 24 drawings from eight patients in the treatment group and 24 drawings from eight patients from the control group were randomly selected for the derived measurements and the corresponding analyses. Patients were given a blank sheet of paper (A4) and crayons of the following colours: red, orange, yellow, green, blue, violet, black, brown and white. The study leader (EBH) instructed the patients to draw a picture of themselves on the theme of self-image. The lightening and the relation between the chair and the table were the same for all fibromyalgia patients. All patients were given a total of two minutes to complete the drawing. Anyone asking questions about the drawing received the answer “as you see it” from the study leader (EBH).

The prominence of the following variables was calculated by the study leader (EBH):

- The amount of body details.
- The number of colours used in the drawing.

- Percentage of the paper used. On completion of the drawing, the paper was divided into smaller parts, each part representing five percent of the total paper. Calculations were then made for each five-percent segment of the paper.
- The number of kilobytes used for scanning the drawing. The scanner was a “Scan HP Scan Jet 6300 C” and 80% of the total capacity of the scanner was used.

The variables were chosen for their ease of measurement and calculation. They have previously been partly used in studies within psychiatric care (Lev-Wiesel et al. 2003; Hacking et al. 1996).

Qualitative analyses

Phenomenological hermeneutic method

The phenomenological hermeneutic method is of a qualitative origin and used in *paper III* to obtain a deeper perspective on the “viewing oneself on video” phenomenon. The phenomenological hermeneutic method is inspired by the French philosopher Paul Ricoeur who wanted different methods to communicate in order to obtain new knowledge (Ricoeur 1976, 1993). The objective of the method is to study and uncover the significant meaning of experienced feelings and thoughts behind the patient’s stories about viewing herself on videotape. This is done by interpreting the text from the patient’s stories and hopefully obtain new knowledge of which the patient is unaware. The texts are processed in order to capture the significance of statements in the interviews. The comprehensive interpretation is affected by the prior experience of the study leader.

The researcher chose this procedure in order to gain deeper understanding of the patients’ self-perception when viewing their bodies on video, and as a complement to the quantitative approach of the video interpretation technique in study IV.

The interpretative analysis

The interviews of the FMS patients were recorded on TDK cassette tapes and transcribed verbatim. Expressions such as pauses, laughter and sighs of feelings were carefully noted. The analysis began with the so-called *naïve reading* of each interview for the purpose of general comprehension. This material served as an inspiration for the structural analysis.

In the structural analysis, the connection and pattern of the text is uncovered by dividing the text into *meaning units*. Each meaning unit is interpreted and transformed into a *condensed meaning unit*. This text – the

condensed meaning unit – becomes the basis for the creation of a *theme* and *sub-themes*.

In the final interpretative phase, the text is reviewed as a whole with the naïve reading, the structural analysis, the research question and the researcher's prior understanding taken into account. The researcher thus reflects on the meeting of the text and the understanding she has obtained with a simultaneous focus on the research issue at hand. The result of these processes is *the complete interpretation*, which in *paper III* is called “the paradoxical integration process”.

Statistics

Paper I

Hormone concentrations were analysed using an ANOVA repeated measures design. A mixed model was used with the repeated factor of time (0, 4, 6, 14 months), the between-groups factor having two levels (treatment or control group) and the different hormone measurements being the dependent variables. Data were checked for the assumption of sphericity using Mauchley's method. No significant disagreement was found and Greenhouse-Geisser correction had minor impact on the ANOVA results.

The video interpretation scores were analysed with non-parametric statistics and the Mann-Whitney U test was used to compare the groups. MADRS and VAS assessments were also analysed using non-parametric statistics. The Mann-Whitney U test was applied to determine the significance of the difference between the two treatment groups with respect to change in scores between baseline and follow-up at 14 months. Correlation coefficients among hormone levels, video interpretation, MADRS and VAS were estimated using non-parametric Spearman rank order correlation coefficients.

Paper II

Self-figure drawings data were analyzed by repeated measures ANOVA. The ANOVA model included one between-groups factor, and one repeated factor, “time”, with three points: at baseline, 6 months and 14 months after treatment initiation. The model also considered the interaction effect between the two factors, i.e. if the change over time was equivalent for the two treatment groups. Significant interactions offer evidence for differential effects of combining the levels of the between-groups and repeated factors. Self-figure drawing data were further correlated to other outcome variables using Spearman rank order correlation coefficients. Data was pooled from treatments and controls.

Global assessment of well being and pain, were all statistically evaluated with the Mann-Whitney U test to compare differences between the two

treatments regimens. The proportion of the following modalities dance, music and drawing and their influence of the FMS patient were also estimated. All statistical tests were two-sided and $p < 0.05$ was considered as statistically significant.

Paper III

According to Ricoeur, the scientific research process lies in the trial or the validation, which is the actual interpretation. The interpretative process is never complete and there is consequently no absolute truth. One must discover a reasonable conclusion through an open communication in which all arguments are presented. One must strive in the direction of truth, with healthy suspicion toward all who claim to have found it. Paul Ricoeur (1976, 1993) affirms interpretative pluralism.

Paper IV

Pairs of ratings were compared at each point in time (month 2 and month 5) that reflected patients' perceptions of their current mobility, movement pain, and life energy standings (1) in reference to their memory of baseline and their perceptions (2) after viewing themselves on video. A Kappa coefficient was used to measure agreement between the different self-reported scale values gathered in the questionnaires. Interpretation of this coefficient was based on Altman (Altman 1997).

A kappa result with weak agreement indicates a systematic change in mobility, movement pain or life energy.

Ethics approval

Approval was obtained from the Regional Research Ethics Committee of the Karolinska Institute in Stockholm, Sweden with respect to *papers I, II* (ref. No. 00-440) and *papers III and IV* (ref. No. 98-008).

Results

Summary of papers

Paper I

Dance/movement therapy and changes in stress-related hormones:

A study of fibromyalgia patients with video interpretation

Eva Bojner Horwitz, Töres Theorell, Ulla Maria Anderberg

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The results of this study based on 6 months of dance/movement therapy, showed a discrepancy between the lack of significant changes in blood concentration of hormones and significant functional improvement as reported by the patient's interpretation of the videos at 14 months. The significant functional improvement was observed in the treatment group as decreased movement pain and increased mobility and life energy assessed by video interpretation, compared to the control group. A tendency to increased levels of cortisol in plasma and saliva at 14 months was seen in the treatment group and may indicate potential activation and/or revitalization of the HPA axis. The video interpretation technique appears to be suitable as a method for analysing effects after dance/movement therapy and to detect non-verbal body signals and predict stress-related signals. Six months of dance/movement therapy was found to be sufficient to improve both physical and psychological function in FMS patients at follow-up after 8 months. Biological markers probably need longer treatment periods to activate the HPA axis to a greater extent.

Paper II

Dance/movement therapy in fibromyalgia patients:

Changes in self-figure drawings and their relation to verbal self-rating scales and hormones

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This study showed that biological markers and verbally orientated scales are not as effective as the visual instruments of self-figure drawing and video interpretation in detecting treatment responses after 6 months of

dance/movement therapy. The video interpretation technique and self-figure drawing captured treatment effects that were not seen on verbal scales or reflected in the hormone levels. These two assessment techniques share a visual component which may be of relevance for fibromyalgia patients in relation to changes in their bodies and minds after non-verbal treatment. In the self-figure drawings, significant differences were seen in the variables “amount of body details” and “amount of paper use in percent” between the treatment group and controls after dance/movement therapy. The treatment group showed a significant increase in the “amount of body details” and “amount of paper use in percent” compared to controls. While no significant differences in hormone levels were found between treatment groups and controls, the variable “amount of body details” in the self-figure drawings was positively correlated to NPY, DHEA-S and cortisol in saliva in the patient group compared to controls. Biological markers could be interpreted as links between verbal/cognitive systems and somatic/visual systems. Specific parts of the verbally orientated ratings in CPRS, “bodily discomfort” and “compulsive act”, were positively correlated to “number of different colours”. The variable “pain and ache” in the CPRS correlated negatively to the “amount of paper use in percent”, i.e. the more pain, the less paper used. Self-figure drawings may be an underestimated tool as they have the capacity to signal emotional, functional, biological and psychological characteristics in the evaluation of FMS after dance/movement therapy.

Paper III

Fibromyalgia patients’ own experiences of video self-interpretation: A phenomenological hermeneutic study

Eva Bojner Horwitz, Töres Theorell, Ulla Maria Anderberg
Scand J Caring Sciences 2003; 17: 257-264

This qualitative study focused on the phenomenon of self-perception of video viewing. The relationships between FMS patients’ inner and outer parts, objects and subject selves, body image and self image, visual and emotional senses, conscious and unconscious feelings, and body and mind perception and its language were illuminated through the video viewing of the patient’s own movement patterns. The video interpretation in combination with interviews facilitated a communication and understanding between the therapist and the patient about the referenced relationships. The patient’s awareness of body and self was improved with the aid of video interpretation, which may help the therapist find better treatment tools that are more individually adapted to the patient. The method can be useful in FMS patients for early identification of maladaptive movement patterns and for better integration of their body and self image. Self-interpretation from

video helps the patients become more aware of body and self signals that may help the patient and clinicians/therapists find suitable treatments. In the complete interpretation of this study, named “the paradoxical integration process”, the conjunction of the above relationships lays the groundwork for the patient’s new body knowledge conception with the implication that the video interpretation technique has therapeutic qualities.

Paper IV

New technique for assessment of self-perception in fibromyalgia patients: A pilot study with video interpretation

Eva Bojner Horwitz, Töres Theorell, Ulla Maria Anderberg

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How visual stimuli affect the mobility, movement pain and life energy of FMS patients after viewing their own movements on video is assessed in this study. All the statistical evaluations showed a lack of agreement between the self-assessment scores for the three variables of mobility, movement pain and life energy, when scores before and after video viewing were compared. Patients thus reported that their own perception of themselves was affected by video viewing. Concerning the life energy variable, the statistical lack of agreement could be due to a systematic discrepancy. The results show that video interpretation technique can be used as a therapeutic instrument and for measuring quantitative and qualitative aspects of the patient’s body movements after dance/movement therapy. In the result of this study, two separate versions of the patient emerge, “the expressed image of the patient herself” and the so-called “video image”. The therapist also has two versions based on the therapist’s own visual impression and the therapist’s interpretation of the image described by the patient. Video interpretation can be used as a valuable instrument for harmonizing the different versions of the patient and detecting discrepancies between the patients’s various images of herself, in order to offer the ultimate treatment.

Discussion

Are the results valid?

In this thesis, both quantitative and qualitative analyses have been used. This has given the thesis a considerable breadth and has resulted in a material in which many details may be questioned. The aim of a quantitative analysis is to support or disprove a hypothesis, whereas a qualitative analysis aims for a deeper understanding of a phenomenon. Validity and reliability have different meanings in these two research contexts. According to Paul Ricoeur, the founder of the phenomenological hermeneutic method, the interpretative process is never complete and therefore there is no absolute truth. Paul Ricoeur affirms interpretative pluralism and validation, which he claims is the value of the interpretation itself. A good interpretation leads to a better understanding. One must discover a reasonable conclusion through an open communication in which all arguments are presented. One must strive in the direction of truth with a healthy suspicion toward all who claim to have found it (Ricoeur 1993, Kristensson-Uggla 1994). *Paper III* of this thesis uses interpretative pluralism and can be seen as a complement to the quantitative analyses of the video interpretation in *paper IV*. When using the qualitative phenomenological hermeneutic method, reproducibility of the type demonstrated in quantitative analyses in *papers I, II and IV* is not possible. Both methods nevertheless produce new knowledge and can in combination enhance our understanding of different aspects and consequences of the perception of the human body and mind.

What do the results tell us?

Dance/movement therapy, defined as part of the Creative Arts therapies, is a treatment form which is suitable for patients with fibromyalgia, as seen in these results. However, the different verbal, hormonal and visual instruments presented in these studies may affect the outcome of this treatment. The visual instruments of video interpretation and self-figure drawings showed significant improvements both in physical and psychological function and in emotional and psychological variables. On the other hand, the verbally based instruments showed no physical, psychological or emotional improvements

in the treatment group compared to controls. The assessment methods consequently influence the treatment outcome.

The focus is on the cognitive function of the FMS patient when discussing assessment of treatment effects. Stress and alexithymia may be factors that could decrease the patient's perceptiveness which in turn may trigger difficulties in focusing on the issue at hand. Symbols and less intellectualised processes may therefore be prioritised and easier to deal with when discussing assessment techniques in FMS patients after dance/movement therapy.

When measuring treatment effects, some processes in our body may be slower to signal change than others. Changes in the hormonal system may take longer to emerge than changes in body movements and self-figure drawings. It would therefore have been interesting to follow up the results of *papers I and II* to monitor further changes in the biological markers. Verbal assessments of the patient's personality and emotions may also have been affected differently with longer follow-up. It may be that we underestimate the body's capacity as a modulator of treatment effects since certain levels of our consciousness, such as verbal/cognitive, visual, emotional, sensational and motor levels appear to be more responsive to treatment than others in different phases of a treatment process. Different stages of the disorder may also be reflected in the varying results of these studies.

Which results are critical for the patient to achieve after treatment? Video assessment showed significant improvement in the treatment group in terms of functional variables (pain, life energy and mobility) and of well-being. These factors signal improved capacity both physically and mentally. It is open to speculation whether results would have been different if the mean age in *papers I and II* had been lower. More patients in the treatment group would probably have returned to work as a result of improved functionality. One patient in the study actually did so.

What aspects of dance/movement therapy had the greatest effect on the patients? Was it the dance, the art, or the music, or the combined effect of these elements? Or was it a social and psychological effect resulting from patients with the same problems being together in a group: the sense of coherence? Simply being in a group where somebody is deeply concerned may be another factor. Or was it a combination of all these aspects? When patients were asked, they rated the dance element as the strongest influence, the musical element as the second strongest, and the art as the third strongest influence. Earlier studies have shown that music and dance are inseparable, which in this study may be interpreted as the dance having stimulated and activated the patients' ability to perceive the music, and vice versa. (Bojner Horwitz 2002).

Verbal or visual assessments after Creative Arts therapies

Apparent disparities were found when the dance/movement therapy treatment was measured using verbal and visual methods. Video interpretation and self-figure drawings captured significant treatment effects that were not reflected in verbal scales or hormone levels after the treatment, compared to controls. A patient's perceptiveness appears to be relative to her capacity to receive information. The patient's perception of a verbally orientated scale may differ from her perception of a visual/somatic scale, and this appears to affect the outcome of the treatment. Video interpretation and self-figure drawing both share a visual component. Fibromyalgia patients appear to find it easier to understand and relate to changes in their bodies and minds when visual modalities are involved in the questionnaires. Alexithymic aspects and stress-related components in our study group may also have affected our patients' ability to report changes.

With respect to the "self-figure drawing" visual instrument, certain correlations to biological markers were observed. The "amount of body details" variable was significantly correlated to NPY and DHEAS (at 14 months) and to cortisol in saliva (at 6 months) in the treatment group, compared to controls. These biological markers may be interpreted as links between the verbal/cognitive systems and the somatic/visual systems and may be involved in unconscious processes where they trigger responses and changes in body behaviour. Longer follow-up could have shown how long it takes for these biological markers to respond to the behavioural changes seen in the visual instruments.

Do verbal questionnaires have limitations?

Measuring the effects of DMT treatment using verbal questionnaires revealed no significant differences between groups. What does this tell us?

The "weekly-based" VAS scale for measuring pain intensity did not identify significant differences between groups as seen by the video interpretation technique. The specificity of pain intensity is debatable in patients who have been exposed to pain for at least 12 years. Psychological and physiological aspects certainly have to be better defined in pain measurement questionnaires. The MADRS median total score did show higher baseline levels in the treatment group than in the controls. These levels decreased most in the treatment group, but no differences were statistically significant. The Sense of Coherence scale showed no differences between groups and one could suspect that even the video interpretation analyses in the control group were perceived as a treatment. It is also possible that the non-treated patients felt a sense of coherence after entering the study since they knew they would have access to the same treatment later on. While SSP and CPRS showed interesting correlations to the self-figure

drawing, from a treatment-control perspective there were no significant differences between treatments. The question of power arises when we discuss the verbal instruments. Treatment effects were only seen in the visually orientated scales which will be discussed later on.

The role of personality and alexithymia in therapy

The complexity of the personality is a result of different factors such as life events, inability to express feelings and emotions, and vulnerability factors which in turn affect interpersonal communication. Researchers have lately shown that endocrine stress responsiveness probably has a large genetic component which is of interest in the discussion of personality and responses to treatment (Hellhammer et al. 1993). As seen in the sample group of FMS patients in this study, different aspects of life events and alexithymic characteristics may have played a role in the treatment outcome. As an example, the fact that 25% of patients in the treatment group reported sexual abuse in their life history may have led to perceptive difficulties during treatment analyses.

Alexithymic characteristics in FMS and the patients' rigid movement patterns suggest that dance/movement therapy is appropriate for this clientele due to the primary focus on sensorimotor communication rather than verbal communication. As seen in *papers I and II*, movement patterns as well as well-being and life energy increased among the FMS patients. It would have been interesting to ascertain if the decrease in "alexithymic" movement patterns corresponds to a decrease in alexithymic personality, with reference to Schilder's work on body image where he explains that changes in body movements also change inner psychological factors (Schilder 1970).

A hypothetical explanation of the increase in movement patterns after DMT may also be found in a decrease in the activity of the vegetative system as a result of symbolic movement expression. The autonomic system does not have to trigger vegetative reactions as seen in an alexithymic state (Ursin 1995). Instead, the patient's limbic system starts to communicate feelings through dance movements where symbols arise from movements and words in order that unconscious ideas can be brought to awareness and lose their hold on the personality.

DMT – from cortical to limbic behavior

If we hypothetically may explain the rigid and awkward movement patterns, seen at the outset in *papers I and II* as "cortical behaviour", the symbolic and emotional exploration through dance/movement therapy upgrades the movements to so-called "limbic behaviour". The sympathetic activity is triggered by emotional exploration through dance and music and the

patient's gestures become more filled with emotional content. ACTH (adrenocorticotrophic hormone), which is secreted by the pituitary, triggers the cortisol response. In the treatment group, cortisol levels at 14 months showed a slight tendency to increase compared to controls, which may be interpreted as a result of this behavioural transformation; from "cortical" to "limbic" behaviour.

Hormones linking body and emotions

In *papers I and II*, the fact that hormone measurements failed to demonstrate more pronounced changes in hormone levels between groups may be due to the short treatment period or relatively brief weekly treatment sessions. Two or more treatment sessions may have been more effective, given the long duration of illness (>12 years). Eight months of follow-up may also have been insufficient for patients to optimise their capacity to cope better with the disorder. However, there were notable differences in the patterns of hormone concentration changes in the two groups at 14 months. Increased levels in both plasma and saliva cortisol may indicate an activation and/or revitalization of the HPA axis which is supported by the increase in functionality and life energy in the treatment group, compared to controls. These changes only became evident at 14 months. The same interval was chosen for analyses of the video interpretation in order to compare the trends in hormonal changes with changes in movement patterns from interpretation of the videotapes.

Hormones are said to aid communication between the central and autonomous nervous systems on the one hand, and behavioural and emotional bodily expression on the other. On this premise we may interpret the VIT results as a mediator of triggered hormones. However, changes in the patient's movement patterns may be a result of changes in inner biological systems (hormones) and it is unclear whether or not hormones always link bodily behaviour and emotions. Had our results shown significant changes in hormone levels between groups, how should that have been interpreted? Are changes in hormone levels more important than the visual effects observed between the groups? The current study suggests that the patient's own visual perception of increase in functionality appears to be a more valuable result of the dance/movement therapy. However, it is also possible that the non-treated patients felt better after entering the study since they knew that they would have access to the same treatment later on and were well recognised. This may also have affected the hormone levels.

Variations in hormones – reflecting syndrome stages

When hormone levels are used to analyse variations in the patient's condition, it is important to bear in mind that hormone levels can be

influenced by many factors. Research into variables that affect hormone levels is in its infancy and it is therefore critical to be able to use the results of hormone measurements as an indicator of the patient's condition. Hormone measurements may for instance depend on when the patient first sought medical help and when the blood samples were drawn. Hormone levels may also vary depending on how long the patient has suffered from pain and other symptoms, and may fluctuate with different stages of the disorder. Patients in this study had mean pain duration of over 12 years, which could be interpreted as most of them being in a late stage of the disorder. However, a complicating factor is that many of these patients had unfortunately received insufficient help and therefore could be regarded as having earlier-stage disease. Are the patients at a stage where their HPA axis still reacts normally to internal and environmental demands? Or has the patient developed a state where the HPA axis no longer reacts at all and could be identified as "exhausted"? These factors are significant for the analysis of hormone levels since the results of hormone measurements may appear to be contradictory at different stages of the disorder for stress-related reasons. It seems highly plausible that these varying results reflect different stages of the syndrome. It is therefore important to determine which stage of the disorder the patient is in. A further complication is that hormone levels may not correlate uniformly with a specific stage of the disorder. As an example, NPY (neuropeptide Y) may be involved in the sympathetic nervous system and could therefore be regarded as a marker of stress (Anderberg et al. 1999c). Elevated plasma levels of NPY have been found in female FMS patients (Anderberg 1999a). However, low levels have also been found in this patient group (Crofford et al. 1994, Clauw 1995). The contradictory results may be due to the HPA axis and sympathetic nervous system responding differently depending on the stage of the patient's disorder. Perturbed NPY levels may be a sign of deficient stress response since NPY and cortisol are interconnected. While the unchanged levels of NPY seen in this study are difficult to interpret, the changed cortisol levels may be the result of a revitalization of the HPA axis, as described above. Cortisol, which increases with mental and physical activation, decreases with prolonged stress and distress. Low levels have been found in patients with post-traumatic stress disorder and in patients suffering from chronic stress (Gunnar et al. 2001, Oquendo et al. 2003, Rosmund et al. 2000).

DHEA-S is an adrenal hormone which reflects well-being and good psychosocial circumstances (Theorell et al. 1998a). However, low levels have been found in patients who have recovered from depression (Fabian et al. 2001) and an increase in DHEA-S has been found in patients with PTSD (Söndergaard et al. 2002) as well as in patients treated with cognitive behavioural therapy (Cruess et al. 1999). In the current study the levels of DHEA-S did not differ between patients and controls.

In this study there were no changes in prolactin after treatment with DMT. Prolactin, which is said to increase in situations of loss of power and crisis (Theorell 1992) does show inter-individual variations in FMS patients (Griep et al. 1993). Other researchers have later found decreased prolactin levels in FMS patients (Landis et al. 2001). Decreased levels of prolactin have also been found in refugees under increased strain and in dependency situations (Söndergaard et al. 2003). Other personality factors such as empathy and hypersensitivity also appear to affect prolactin levels (Sivik 2004).

As seen in a report on patients with different psychosomatic conditions who received treatment with art psychotherapy, serum uric acid concentration was measured and a significant increase was seen between a period of seven to eighteen months after treatment. After two years of treatment the levels decreased (Theorell et al. 1995). Serum uric acid concentration maybe more sensitive than hormones in mirroring increasing energy levels after art psychotherapy.

The size of the study group is another factor which has been discussed in earlier studies related to significant changes in hormone levels. The lack of significant changes in hormone levels and the great variance within the two groups, seen in this study, may also be due to a small patient sample.

Video interpretation detects different patient versions

When evaluating creative art therapies or other rehabilitation programmes, video interpretation may be useful due to its somatic focus (*papers I and II*). Perception of body signals and movement patterns are more visible when you see yourself on videotape. Facial expressions and body language influence the perception. The improved perceptive capacity seen in the treatment group (*papers I and II*) can be explained by the repeated body awareness tasks in the therapeutic process. Expressing oneself in dance/movement therapy may therefore be interpreted as a way of helping oneself to improve body image and attitudes.

Through the video interpretation, patients may become aware of unconscious and unexpressed feelings and affects. In *paper III*, where the FMS patients were interviewed about their self-perception on seeing themselves on video, unconscious thoughts appeared to awaken and initiate processes within the patient.

As seen in *paper IV*, patients reported that their perception of themselves was affected by watching the videotapes, especially in terms of the life energy variable. The video interpretation technique has made it possible to detect discrepancies between patients' various images of themselves. An interesting question appeared concerning the different images or "versions" of the patient that we as therapists treat. Are we dealing with a patient who sees a discrepancy between her expressed image and the image that appears

after viewing herself on video? The therapist may in turn also be dealing with two different patient versions: one based on her own visual impression of the patient and one based on the interpretation of the image as described by the patient. The goal must be to find a common “version” which is shared by the therapist as well as the patient. The video interpretation technique can be used to initiate dialogue with FMS patients and discuss how they see their bodies visually, and how they perceive their bodies emotionally, to determine which version is of relevance to the course of treatment.

Reading body signals – a critical therapeutic tool

When treating stress-related disorders, video interpretation may be used to help patients perceive “healthy” body signals such as muscle tension and early onset of pain. This could be important as the onset of pain in FMS patients often occurs in connection with emotionally stressful life events (Anderberg 2000a). If it is true that the body can mirror more than words can express, the video interpretation technique may benefit patients who have difficulty verbalizing their feelings. It therefore appears more relevant to use somatically directed methods when measuring body movements and body language. Viewing and interpreting herself on videotape may also help the patient to reflect and deepen her sense of self-perception and give the therapist and patient a common understanding of the status of the patient’s self-perception after treatment. Seen in this broader perspective, treatment tools that comprise self-perception may be very important due to their apparent ability to enhance treatment effects in FMS patients.

In another perspective, reading body signals may also help prevent stress disorders. The body has much knowledge and speaks its own language and is probably more alert in signalling changes before they become evident in inner biological systems. Using the language of the body may help therapists and patients gain insights that can prevent maladaptive movements and further progression of stress-related disorders.

Self-figure drawing – a mirror of well-being and stress?

When comparing changes in the self-figure drawings of FMS patients after DMT to controls, it is interesting to note that the factors “amount of body details” and “amount of paper use in percent” differed significantly (*papers I and II*). These factors also correlated to certain hormones at given points in time. Interestingly, the factor “number of different colours” in the self-figure drawing correlated positively to “bodily discomfort” and “compulsive act” in CPRS. The greater the physical discomfort and the more compulsive the actions, the more colours were featured in the patient’s drawing. “Pain and ache” in the CPRS correlated negatively to the “amount of paper use in percent”, i.e. patients appeared to “shrink” on the paper when in pain. Within

the SSP personality questionnaire, the STA factor (somatic anxiety) also decreased in the treatment group compared to controls. Less somatic anxiety may be expressed by an increase of body details in the self-figure drawing. A picture appears to reflect non-verbal issues that are linked to the patient's inner senses. Colour appears to reflect comfort and compulsive thoughts, while picture size appears to represent degree of pain, and amount of body details may be related to stress hormones and well-being. This concurs with previous research which has shown that psychological and emotional problems can be mirrored in human figure drawings and in self-portraits (Offman et al. 1992, Morin et al. 1998).

As discussed above, body awareness and symbolic qualities of movements, which form part of the DMT technique used, may have influenced the patients to focus on body perception. This in turn may have induced the patients to produce more detailed drawings and use a greater portion of the paper. The dance and music modality may arouse creativity processes that increase and affect the ability to draw while also improving the sense of well-being.

It is interesting to consider whether changes in self-figure drawing could be interpreted as an increase in the FMS patient's cognitive functions. Comparison of changes in the self-figure drawings with the results of video interpretation suggests that the "amount of body details" could reflect an increase in mobility. The "amount of paper use in percent" may reflect the movement pain factor, and colour may reflect the life energy factor in the video interpretation.

Another interesting way of evaluating the self-figure drawings would be to allow patients to interpret their own self-figure drawings before and after dance/movement therapy.

Coping strategies of fibromyalgia patients when under stress

Most fibromyalgia patients have to deal with concentration and memory problems. Long-term pain is in many ways taxing and stressful. The complexity of words, especially under time pressure, may trigger stress and put the patient under strain which in turn may give rise to new stress reactions. Can FMS patients, who are in pain and often suffer from burnout, evaluate symptoms as effectively from verbal questionnaires as when visual assessment techniques are used? From an alexithymic perspective, it may also be unfair or irrelevant to demand information from the patient only through words. Due to their visual/somatic nature, self-figure drawing techniques and video interpretation may appear less demanding to these types of patients and therefore be more reliable.

Music and dance – inseparable modalities

The music modality within dance/movement therapy was ranked as having the second strongest influence on the patients. Is it possible to separate dance from music? Music and dance have always been considered inseparable (Bojner Horwitz 2004a). Yet, in some African countries music and dance share the same word. The initiation of a movement depends on music to some extent. As part of one session, the patients in this study were invited to dance without music. The movement patterns and energy decreased directly. It would be interesting to know whether our results would have been the same if no music had been used in the dancing sessions.

The context in which music is presented affects our perception of the music. Biological, cognitive, social, cultural and psychological aspects are always involved when we perceive music, and this must be taken into account in the choice of music for therapy (Bojner-Horwitz 2002). In these studies we therefore allowed the patients to choose their desired music genres by voting, with the majority determining the decision.

Brusca's definition of music (1989, pp. 10) could also be used to describe dance:

“(Music) can be defined as the art of temporally organizing sounds and its various physical and experiential components, for the purpose of creating and interpreting expressive forms that re-enact, elaborate, or bring meaning to the human life experience”.

The body as the centre in perceptive processes

Why is it important to determine whether FMS patients are in contact with their bodies? Without the body we are incapable of reflecting on ourselves, according to Merleau-Ponty. He was the first philosopher to place the body at the centre and argues that we use our bodies as the starting point for understanding our existence (Merleau-Ponty 1996). In the total interpretation of FMS patients' self-perception on video viewing, there is evidence that FMS patients are able to use their bodies to integrate new and contradictory knowledge about themselves and their bodies. It enables patients to initiate the process of reflecting on different parts of their bodies; to see themselves more objectively, which is not possible through mirror viewing. New insights are born and “the paradoxical integration process” helps patients look at themselves in a new, more integrated manner. Discrepancies between visual and emotional aspects of their bodies, other people's perception of their looks and behaviour, and difficulty connecting the body and self-image were questions that arose. Allowing FMS patients to interpret themselves from videotapes makes them more aware of both body and self signals, which in turn may help them apply more conscious strategies to master situations and prevent further development of negative signals into

perceptions of pain. According to the previously referenced stages of the disorder, the video interpretation technique, where the body is at the centre, could be used to prevent dysfunction and improve movement patterns by communicating findings jointly to the patient and the therapist.

Phenomenological hermeneutic method in body science

The importance of investigating the body in a scientific manner may be further analysed by using phenomenological or phenomenological hermeneutic methods (Bullington 1999). The body needs more space in medical science and must be dealt with in both objective and subjective terms. How can we understand our patients if we only use quantitative analyses? *Papers III and IV* are examples of a combined quantitative and qualitative methodological approach where *paper III* helps us gain deeper understanding of the phenomenon of self-perception from video viewing. Without the patient's experiences of interpreting themselves from video viewing, the therapeutic application perspective of the video interpretation technique would have been lost. The patients "lived body" is so much more than numbers and if we fail to understand our patients' perceptions, how can we explain what is good for them?

The patients "lived body" has only recently made its way into the medical community (Bullington 1999) and it is important that we legitimise the possibility of investigating the body in a scientific manner. By using the phenomenological hermeneutic approach in this thesis, the researcher takes a step towards the importance of the dualistic perspective in medical care. The "understanding always precedes explanation" (Bullington 1999).

Future assessments and cost effectiveness

From research we know that negative behavioural and psychological factors are related to the risk of developing a chronic pain syndrome such as FMS. Techniques that help the patient gain increased awareness of her body, or help the therapist initiate dialogue with the patient are therefore highly relevant in the rehabilitation of both physiological and psychological injuries. Behaviours can be interpreted and analysed in order to bring patients "back on track" and reduce the risk of developing chronic pain disorders.

In clinical work it is important to develop and increase our understanding of how psychotherapy, both verbal and non-verbal, works on a psycho-biological level. Moreover, we need to better understand the potential role of specific biological markers (such as saliva tests) in the diagnosis of disorders. Research should be focused on developing assessment techniques, including objective markers, to monitor treatments over time and measure their effects. The development of future assessment techniques will be best

served by close cooperation among clinicians across several disciplines: creative art therapists, verbal therapists, physicians, nurses and physiotherapists.

More cost-effective tools are needed because of the increase in patients with stress-related disorders, one being FMS. These may include self-figure drawings and films in combination with other supportive verbal scales and standardised verbal ratings as well as visually orientated methods.

There is continuing debate on both the existence and potential treatment of FMS. The video interpretation technique can help physicians and public health authorities' better understand FMS and devise appropriate medical and public policy responses to FMS patients.

A model of patient perceptions of modalities

Another important outcome from these studies concerns the conscious levels at which our patients are receptive to therapy, and the levels we as therapists assign to our assessment tools.

Different levels or aspects of consciousness are discussed in the literature in terms of body-related psychotherapy and other self-development theories (Downing 1996). According to Downing, these levels are:

1. The *verbal-cognitive* level, including thinking processes which could be verbalised.
2. The *visual* level, including visual fantasies or thoughts which include visual gestalts or visual impressions of the environment. Images from audio stimuli are also included at this level.
3. The *emotional* level, which represents the perception of a feeling, e.g. happy or sad.
4. The *sensational* level, which focuses on bodily sensations, e.g. warm or stiff.
5. The *motor* level which includes the body's position and movement in a room.

Downing notes that no hierarchies exist among these levels.

Ideally, treatment and assessment methods should match each other to provide a fair picture of the patient and of the potential effects of treatment on each individual. In our studies we have therefore employed assessment and treatment techniques aimed at all of Downing's levels. Figure 1 below describes the various techniques used in these studies, classified according to Downing's definitions.

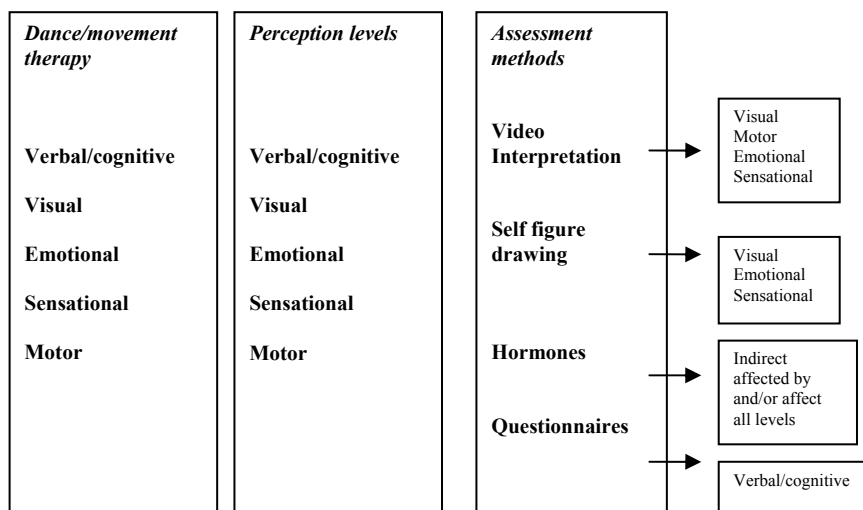


Figure 1. A hypothetical model of the different modalities involved in dance/movement therapy and the patient's different conscious levels for receiving treatment effects are presented in Figure 1. The figure also identifies the different assessment methods used in this thesis and the referenced conscious modalities, according to Downing, presented in each assessment technique. We see that the conscious level which is present in the questionnaires is primarily the verbal/cognitive level where no significant differences were found between groups. The perception levels in the hormone analyses are not comparable with the self-rating scales, but may indirectly be affected by and/or affect all conscious levels. Both the video interpretation technique and the self-figure drawing covers perception levels where visual modalities are present. The perception of viewing seems to capture more information compared to the other perception modalities in this patient group. When words alone are used to evaluate symptoms and treatment effects, valuable information may be lost. Visual modalities may be a good starting point for capturing information that may be missing from verbal questionnaires.

It is important to know which assessment technique is most suitable at the patient's stage of the disorder, as discussed above. By using the video interpretation technique, patients can raise their awareness of these different modalities by discussing the options with the therapist.

Another aspect of this is that the patients' state of the disorder may involve activity of hyper arousal, depending of earlier life events and post traumas. If this is the case, the patients will not easily be taught complex cognitive information. The patient will instead focus on non-verbal cues as for example body movements, facial expressions, tone of voice; not the words which accompany this. In a state of fear or arousal, we can expect our patients to have access to their non-verbal memories and language (Perry 1997). This is important to have in mind when discussing therapeutic interventions and different assessment techniques.

Another aspect of the results of this study may be that treatment with dance/movement therapy has not affected the patients at the verbal/cognitive level. That could indicate that the DMT method only has visual, sensational, emotional and motor effects in this cohort. The verbal/cognitive levels may take longer to trigger and affect.

With regard to the results of these studies, where video analyses and self-figure drawings were better able to signal changes over time than verbal questionnaires, our findings are comparable with other research reports. Interestingly, another study has shown that video analyses were more nuanced in delivering information on certain variables compared to verbal questionnaires and other direct methods when measuring risk factors associated with tree seedling (Spielholz et al. 2001). It is important to report such errors in order to avoid misclassification in e.g. epidemiological studies.

The researcher as therapist

When a researcher also involves herself as a therapist, research objectivity and impartiality are called into question. The behaviour and perspective appropriate to a therapist is not the same as those of an impartial observer and analyst. Nevertheless, the two roles can be confused and the therapist may lose herself in the objective analysis of movements. However, in dance movement therapy the two perspectives are not always in conflict. A researcher's perspective may for instance aid the analysis of movements and reactions as part of the dance/movement therapy process. Indeed, it has been critical to these studies that one person was able to assume both these roles.

Simultaneous roles can facilitate the application of other methods as well. When using the phenomenological hermeneutic method, combining the roles of researcher, physiotherapist and dance/movement therapist provided prior understanding and experience of working with the video interpretation method. This may have helped the researcher maintain a broader perspective and reach a deeper understanding of the patient's condition.

A verbal psychotherapist was involved in this research process to help the researcher and dance/movement therapist to be aware of the specific advantages and disadvantages of these two roles.

Methodological considerations

The findings in this thesis are based on a small patient group which has implications for the ability to generalise the results especially for the non-significant results. As an example, possible true differences in psychological variables and stress between the two groups may not have been detected. The sample size and the statistical power calculated was based on the study design to detect improved physical and psychological function and on pain as a result of treatment compared to controls. The hormone levels have shown great variance within the two groups and therefore the statistical power is low and may be insufficient to demonstrate differences between treatments. A larger study population would give us better power to estimate the true pattern of the hormone levels.

Reliability and validity have different meanings in qualitative and quantitative analyses, as discussed above. The reproducibility of phenomenological hermeneutic analyses in *study III* is not achievable with respect to the phenomenon of self-perception from video viewing because the researcher's prior understanding is part of the interpretation.

Alexithymia and other stress-related personality aspects of the FMS patients may also have affected the results. By using verbal, non-verbal, visual and hormonal evaluation techniques, these factors are evident e.g. in the verbal assessments compared to the other instruments.

An inter-rater reliability test is considered of critical importance for evaluation of the VIT and was not made available in these studies.

Conclusions

This is the first study where verbal, visual and hormonal analyses were used after treatment with the Creative Art therapy; dance/movement therapy in FMS patients. Six months of dance/movement therapy appears sufficient to improve both psychological and physical function and help FMS patients cope better with their disorder, as indicated by the visual analyses in this study. Both the dance/movement therapy and the video interpretation affected the FMS patients' well-being, life energy, self perception and perception of pain. The video interpretation technique and self-figure drawing captured treatment effects that were not evident from verbal scales or reflected in hormone levels. Biological markers probably need a longer treatment period to activate the HPA axis and its inter-related hormones and peptides to the extent where significant differences appear between treated and non-treated patients. However, it is also possible that the non-treated patients felt better after entering the study since they knew that they would have access to the same treatment later on.

The use of different assessment techniques may affect the treatment outcome and verbal instrumentation may not be the most appropriate in this patient group. Difficulties perceiving information through verbal/cognitive modalities as well as alexithymia are factors that are discussed. It is important to know which assessment technique is the most suitable at the patient's stage of the disorder. Ideally, treatment and assessment methods should match in order to provide a fair picture of the patient and the potential effects of treatment in each individual.

Video interpretation and self-figure drawing may offer a new way of helping FMS patients assess their symptoms following Creative Arts therapies. These visual assessment tools can also be used therapeutically. The video interpretation technique may be useful not only in FMS patients, but also in other stress-related disorders for early identification of maladaptive movement patterns and as a mirror of facial and bodily expressions of emotions. This ability to "read" and interpret body signals may help to prevent the development of FMS, and possibly other stress-related disorders. The video interpretation technique can help physicians and public health authorities' better understand FMS and devise appropriate medical and public policy responses to FMS patients.

Suggestions for further research

- Conduct further studies with longer follow-up and treatment periods with DMT or other Creative Arts therapies and monitoring of biological markers and personality changes.
- Identify new groups that may be suitable for DMT, e.g. patients with stress-related disorders, post-traumatic stress disorder and depressive states.
- Investigate variables that can predict the patients who will respond to DMT treatment or not.
- Deepen our knowledge of the different stages of FMS and other stress-related disorders to facilitate detection and earlier identification of maladaptive coping strategies and prevention of chronic pain states.
- Deepen our knowledge of stress hormone reactions at different stages of a disorder and how treatment may affect these stages.
- Increase our knowledge of the patient's different perception levels with respect to symptom communication and treatment.

- Investigate the patient's symbolic ability to communicate by reading facial and bodily expressions of emotions and affects with the aid of video interpretation and self-figure drawing.
- Place the body in focus when measuring treatment effects in general and learn more about "body language" as a mediator e.g. of alexithymia and stress-related symptoms.
- Deepen our knowledge of the video interpretation technique through inter-rater reliability tests and use of video interpretation in cohorts of healthy subjects.

- Develop virtual showrooms where the patient can view herself objectively on a video screen and clinicians, together with the patient, can communicate future rehabilitation strategies.
- Deepen our knowledge of muscle and body memory in chronic pain patients in connection with video interpretation.
- Enhance communication between different healthcare professions by using video interpretation.

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Summary in Swedish

Fibromyalgi är en kronisk smärtsjukdom som är vanligt förekommande bland kvinnor. Två till fyra procent av befolkningen har denna sjukdom, varav 90 procent är kvinnor. Fibromyalgi har länge ansetts vara en i många stycken oförklarlig sjukdom eftersom diagnosen baserats på subjektiva besvär och att psykopatologiska orsaker inte har kunnat påvisas vid rutinprover eller röntgenundersökningar. Dock har man vid de senaste årens intensiva forskning gällande sjukdomen kunnat påvisa en rad förändringar både i blodplasma och cerebrospinalvätska vilket bland annat visar på störd smärtsensibilitet och effekter av ett förändrat stresssystem. Det har också framkommit att en stor del av dessa patienter upplevt påfrestande händelser både i barndomen och före sjukdomsdebut samt att de är oftast mycket ambitiösa, vilket kan förstärka effekten av stress och påfrestning.

Det har länge varit känt att konstnärliga terapiformer, däribland dansterapi varit effektiva vid psykiska sjukdomar och stressrelaterade tillstånd. Konstnärliga terapier har visat sig vara gynnsamma när det gäller att mana fram känslor av välbefinnande och i att skapa symboliska uttryck för emotionella erfarenheter, vilket i sig kan leda till ökad självkontroll och ökat självförtroende.

I detta forskningsprojekt har fibromyalgipatienter behandlats med den konstnärliga terapiformen dansterapi till musik under en period av sex månader. En uppföljning har skett efter ytterligare åtta månader. Trettiosex fibromyalgipatienter har bildat en behandlings- och en kontrollgrupp. Utvärdering av behandlingseffekter har utförts med hjälp av en videotolkningsteknik, självbildsteckningar, båda i kombination med blodprovtagning av olika stressrelaterade hormoner (Kortisol, Prolaktin, Dehydroepiandrosteronsulfat, Neuropeptid Y) samt olika självskattningsskalor. Kombinationen av flera både verbala och icke verbala instrument samt både kvalitativ och kvantitativ metodik har sålunda använts för att utvärdera effekter av dans- och rörelseterapi samt videotolkning på fibromyalgipatienter.

Delarbete I

Dans- och rörelseterapi och dess inflytande på stressrelaterade hormoner: En studie på fibromyalgipatienter med videotolkning

I denna studie har dansterapins effekt utvärderats med hjälp av hormonanalys och med hjälp av videotolkningsteknik. Studien är kontrollerad och beskriver den dansterapeutiska metoden. Studien pågick under sex månader och en uppföljning har ägt rum efter ytterligare åtta månader. Resultatet visar på signifikant förbättrad rörlighet, minskad rörlighetssmärta och ökad livsenergi vilket i behandlingsgruppen kunde avläsas med hjälp av videotekniken. I denna patientgrupp kunde även en förändring av kortisolnivåerna ses med hjälp av blodprovtagning vid uppföljningen. Denna förändring kan tolkas som en revitaliserande process av den s.k. HPA- axeln vilken ger utslag först vid uppföljningen. Genom att använda både visuellt och biologiskt utvärderingsinstrument, vilka gav utslag vid olika tidpunkter i processen, har båda metoderna visat sig väsentliga vid studier där resultat förväntas efter längre behandlingsperioder. Sex månader med dansterapi visar sig vara tillräckligt för att förbättra både fysiska och psykologiska funktioner hos fibromyalgipatienter, vilket uppmätts efter åtta månaders uppföljning. Videotolkningstekniken visar sig dessutom vara lämplig som metod dels för att analysera effekter av dansterapi, dels för att detektera icke-verbala kroppssignaler samt för att förutse patientens stressrelaterade kroppssignaler.

Delarbete II

Dans- och rörelseterapi vid fibromyalgi: Förändringar i självbildsteckningar och deras relation till verbala självskattningsskalor och hormoner

I denna kontrollerade studie har för första gången resultat av självbildsteckningar i kombination med videotolkningsteknik och andra självskattningsskalor presenterats för att påvisa förändring över tid i en process med sex månaders dans- och rörelseterapi på patienter med fibromyalgi. Dessa resultat har även satts i relation till hormonnivåer och data som är analyserade med hjälp av multivariat analys ANOVA.

Videotolkningstekniken och självbildsteckningarna fångade upp signifikanta behandlingseffekter som inte kunde ses i de verbala skattningsskalorna, ej heller i hormonnivåerna. Resultatet av dansterapibehandling visade att behandlingsgruppen noterade en ökning av antalet kroppsdelar och andelen pappersanvändning i självbildsteckningarna. Vissa delar av självskattningsformulären var positivt korrelerade till självbildsteckningarna såsom t.ex. kroppsliga obehag och tvångshandlingar som korrelerade positivt till mängden använd färg och smärtor och värk som

korrelerade negativt med procentandelen pappersmängd som använts. Vidare korrelerade NPY, kortisol och DHEA-S positivt med antalet tecknade kroppsdelar i självbildsteckningarna. Fibromyalgipatienterna i behandlingsgruppen skattade också sin smärta mindre intensivt och sitt välbefinnande större efter behandling med dansterapi jämfört med patienterna i kontrollgruppen. Patienterna som deltagit i dansterapin skattade dansen som den modalitet som hade störst inflytande under dansterapi-processen, därefter kom musiken och sist modaliteten målning/teckning.

Delarbete III

Fibromyalgipatienters uppfattning av att tolka sig själva från video: En fenomenologisk hermeneutisk studie

Denna kvalitativa studie fokuserar på fenomenet självuppfattning av att se sig själv på video. Studien bygger på videotolkningar i kombination med intervjuer efter att patienterna utfört ett visst antal standardiserade rörelsemönster framför videokamera. Resultatet visade att patienten ökade sin kroppsmedvetenhet och sin kroppskänedom genom att få se sig själv retrospektivt på video. Detta i sin tur ökade kommunikationen mellan terapeuten och patienten och förbättrade integrationen av kropps- och självbilden med förbättrat självförtroende som följd. Detta har i sin tur också påverkat det fortsatta behandlings- och rehabiliteringsprogrammet för den enskilda patienten. Att se sig själv på video har även fungerat terapeutiskt såtillvida att patienterna gavs möjlighet att diskutera sina innersta tankar och känslor i samband med uppspelningen av videofilmerna på dem själva. Resultatet av denna studie visar att patienterna lärde sig att integrera ny och ibland motstridig kunskap om sig själva. Tidigare undanstopgade problem kunde tas fram och bearbetas, vilket fick patienterna att må bättre och lära sig hur de i framtiden skulle hantera liknande situationer och därmed undvika låsningar och långvarig stressproblematik som lätt skulle kunna övergå i spänningstillstånd med smärta som följd.

Delarbete IV

Ny teknik som mäter självuppfattning hos fibromyalgipatienter: En pilotstudie med hjälp av videotolkning

Detta delarbete är en kvantitativ studie där fibromyalgipatienter har gjort självskattningar av sitt tillstånd efter att ha sett sig själva på videofilm. Hur visuella stimuli från videofilmerna påverkade patienternas rörlighet, rörelsesmärta och livsenergi har uppmätts med hjälp av ett självskattningsinstrument. Resultatet visade att patienternas tillstånd påverkades av videofilmerna. Majoriteten av patienterna upplevde t.ex. en

ökning av sin livsenergi. Dessutom rapporterade patienterna att deras rörlighet och rörelsesmärta påverkades efter att de fått se sig själva på film. Resultaten pekar på att videotolkningstekniken kan användas som ett terapeutiskt instrument för att mäta både kvantitativa och kvalitativa aspekter på patienternas rörelsemönster efter dansterapi. Patienternas upplevelse av smärta lyfts fram och patienternas själv- och kroppsbilder kontra terapeutens bilder av patienten diskuteras och integreras. Videotolkning kan vara ett värdefullt instrument att harmonisera de olika "patientversionerna" som uppstått efter videotolkningen och att detektera skillnader mellan patientens olika bilder av sig själv. Detta kan i sin tur bidra till ett än bättre behandlingsupplägg.

Sex månaders behandling med dansterapi har förbättrat både den fysiska och psykologiska funktionen hos kvinnliga fibromyalgipatienter. Både videotolkning och självbildsteckning fångade upp behandlingseffekter till skillnad från de verbala och hormonella analyserna. De biologiska markörerna behöver troligtvis längre behandlingstid och/eller längre uppföljningstid för att aktivera den s.k. HPA axeln för att signifikanta skillnader skall uppstå mellan grupperna. Kroppspråket tycks vara mer alert att signalera kroppsliga förändringar på över tid jämfört med förändringar av stressrelaterade hormoner.

Valet och användandet av olika mätinstrument kan således i sig påverka behandlingsresultatet. Mätinstrument som utvärderar konstnärliga terapiformer med endast ord kan t.ex. på grund av patientens alexithyma personlighet utelämna viktiga behandlingsresultat. Vid vilket stadium som patienten befinner sig i sitt sjukdomsförlopp och vid vilken medvetandenivå som patienten tar emot information, är faktorer som diskuteras.

Videotolkning är en metod som kan användas för att fånga upp och tidigt identifiera ofördelaktiga rörelsemönster och/eller spegla kroppsliga känslouttryck. Videotolkning kan underlätta för vårdpersonal och ge ökad förståelse kring FMS samt fungera som både terapeutiskt och funktionellt verktyg. Självbildsteckning och film i kombination med stödjande verbala skattningsinstrument kan vara nästa steg i utvecklandet av framtida mätinstrument. Sammanfattningsvis visar denna studie att den konstnärliga terapiformen dansterapi och videotolkning har stor inverkan på fibromyalgipatienters välbefinnande, självuppfattning och smärtupplevelse.

References

- Altman DG. (1997). Practical statistics for medical research. Chapman & Hall.
- Ambra LN. (1985). Approaches used in dance/movement therapy with adult women incest survivors. *American J of Dance Therapy*; 3: 15-24.
- Anderberg UM (1999a). Fibromyalgia syndrome in women - a stress disorder? Neurobiological and hormonal aspects. Doctoral dissertation from the faculty of Medicine, Dept. of Neuroscience, Psychiatry, University Hospital, Uppsala, Sweden. Printed in Sweden by Uppsala University Repro Economicum, Uppsala, Sweden, 1999. ISBN 91-554-4366-4.
- Anderberg UM, Forsgren T, Ekselius L, Marteinsdottir I, Hallman J. (1999b). Personality traits on the basis of the Temperament and Character Inventory in female fibromyalgia syndrome patients. *Nord J Psychiatry*; 53: 353-359.
- Anderberg UM, Liu Z, Berglund L, Nyberg F. (1999c). Elevated plasma levels of neuropeptide Y in female fibromyalgia syndrom patients. *European Journal of Pain*; 3: 19-30.
- Anderberg UM, Marteinsdottir I, Theorell T, von Knorring L. (2000a). The impact of life events in female patients with fibromyalgia and in female healthy controls. *Eur Psychiatry*; 15: 295-301.
- Anderberg UM, Uvnäs-Moberg K. (2000b). Plasma oxytocin levels in female fibromyalgia syndrome patients. *Z Rheum*; 59: 373-379.
- Anderberg UM, Marteinsdottir I, von Knorring L. (2000c). Citalopram in patients with fibromyalgia – a randomized, double-blind, placebo-controlled study. *Eur J of Pain*; 4: 27-35.
- Arn (1999). A Bio-Psychological analysis of functional gastrointestinal disorders and a clinical trial of its treatment using psychodrama. A doctoral Dissertation from the Department of Public Health Sciences, Karolinska Institute and the National Institute for Psychosocial Factors and Health, Stockholm, Sweden. ISBN 91-628-3905-5.
- Arnetz B, Theorell T, Levi L, Kallner A, Eneroth P. (1983). An experimental study of social isolation of elderly people: psychoendocrine and metabolic effects. *Psychosom Med*; 45: 395-406.
- Arrington G. (1954). Music in Medicine. In Music Therapy (ed. Podolsky E). pp. 252-287. Philisophical Library, New York.
- Barker SL, Funk SC, Houston BK. (1988). Psychological treatment versus non-specific factors: A meta-analysis of conditions that engender comparable expectations for improvement. *Clinicl Psychology Review*; 8: 579-594.

- Bell IR, Miller CS, Schwartz GE. (1992). An olfactory-limbic model of multiple chemical sensitivity syndrome: possible relationships to kindling and affective spectrum disorders. *Biol Psychiatry*; 32: 218-242.
- Bengtsson M, Bengtsson A, Jorfeldt L. (1989). Diagnostic epidural opioid blockade in primary fibromyalgia at rest and during exercise. *Pain*; 39: 171-180.
- Berrol CF. (1992). The neurophysiologic basis of the mind-body connection in dance/movement therapy. *American J of Dance Therapy*; 14: 19-30.
- Beutler LE, Engle D, Oro-Beutler E, Daldrup R. (1986). Inability to express intense affect: A common link between depression and pain. *Journal of consulting and clinical psychology*; 54: 752-769.
- Birdwhistell R (1970). *Kinesics and Context, essays on body motion communication*. Pennsylvania, University of Pennsylvania Press.
- Boisset-Pioro MH, Esdaile JM, Fitzcharles MA. (1995). Sexual and physical abuse in women with fibromyalgia syndrome. *Arthritis Rheum* 38: 235-241.
- Bojner Horwitz E. (2002). *Music in Dance/movement therapy*. C-uppsats University of Dance, Stockholm, Sweden.
- Bojner Horwitz E, Theorell T, Anderberg UM. (2003a). Fibromyalgia patients own experiences of video self-interpretation: a phenomenological-hermeneutic study. *Scand J Caring Science*; 17: 1-8.
- Bojner Horwitz E. (2003b). A Dance/movement Therapy model for chronic pain patients: a process description (in manuscript).
- Bojner Horwitz E, Bojner G. (2004a). *Må bättre med musik. [Improve your health with music.]* ICA förlag, Västerås, Sweden.
- Bojner Horwitz E, Theorell T, Anderberg UM. (2004b). New technique for assessment of clinical condition in fibromyalgia – a pilot study by video-interpretation. *The Arts in Psychotherapy*; 31: 153-164.
- Boris R. (2001). The root of dance therapy: a consideration of movement, dancing and verbalization vis-à-vis dance/movement/therapy. *Psychoanalytic Inquiry*; 356-367.
- Brusca KE. (1989). *Defining Music Therapy*. Phoenixville, PA. Barcelona.
- Buck JN. (1966). *The House Tree Person Technique. Revised Manual*. Western Psychological Services, Los Angeles CA Fourth Printing March 1977.
- Bullington J. (1999). *The mysterious life of the body: A new look at Psychosomatics*. Department of Health and Society, University of Lindköping, Sweden. Dissertation. Printed by Kanalttryckeriet, Motala AB, 1999. ISBN 91-7219-4757x.
- Burckhardt CS, Clark SR, Bennet RM. (1993). Fibromyalgia and Quality of life; a comparative analysis. *J Rheum*; 20: 475-479.
- Chrousos GP, Gold PW. (1992). The concepts of stress and stress system disorders. *JAMA* ; 267: 1244-1252.
- Chrousos GP. (1998). A healthy body in a healthy mind – and vice versa – the damaging power of uncontrollable stress. *J of Clin Endocrin and Metabolism*; 83: 1842-1845.

- Clauw D. (1995). Fibromyalgia: More than just a musculoskeletal disease. *American Family Physician*; 52: 843-851.
- Cohen S, Walco G. (1999). Dance/movement Therapy for children and Adolescents with cancer. *Cancer Practice*; 7: 34-42.
- Collis KG. (1999). An explanatory study towards the development of a picture rating scale for schizophrenia. Dissertation Abstract International: Section B: *The science and Engineering*; 60: 55-69.
- Crofford LJ, Pillemer SR, Kalogeras KT, Cash JM, Michelson D, Kling MA, Sternberg EM, Gold PW, Chrousos GP, Wilder RL. (1994). Hypothalamic-Pituitary-Adrenal axis perturbations in patients with fibromyalgia. *Arthritis Rheum*; 37: 1583-1592.
- Crofford LJ, Demitrack MA. (1996). Evidence that abnormalities of central neurohormonal systems are key to understanding fibromyalgia and chronic fatigue syndrome. *Rheum Disease Clin of North Am*; 22: 267-284.
- Crofford LJ. (1998). The hypothalamic-pituitary-adrenal stress axis in fibromyalgia and chronic fatigue syndrom. *Z Rheumatol*; 57: 67-71.
- Cruess DG, Antoni MH, Kumar M et al. (1999). Cognitive-behavioral stress management buffers decreases in dehydroepiandrosterone sulphate (DHEA-S) and increases in the cortisol/DHEA-S ratio and reduces mood disturbance and perceived stress among HIV-seropositive men. *Psychoneuroendocrinology*; 24: 537-549.
- Cruz Flaum R, Sabers LD. (1998). Dance/movement therapy is more effective than previously reported. *The Arts in Psychotherapy*; 25: 101-104.
- Cumming WJK. (1988). The neurobiology of the body schema. *British Journal of Psychiatr*; 153: 7-11.
- Davis MC, Zautra AJ, Reich JW. (2001). Vulnerability to stress among women in chronic pain from fibromyalgia and osteoarthritis. *Ann Behav Med*; 23: 215-26.
- De Gennaro L, Ferrara M, Cristiani R, Curcio G, Martiradonna V, Bertini M. (2003). Alexithymia and dream recall upon spontaneous morning awakening. *Psychosomatic Medicine*; 65: 301-306
- De la Torre B. (1994). Psychoendocrinologic mechanism of life stress. *Stress Medicine*; 10: 107-114.
- Downing G. (1996.) Kroppen och Ordet. Kroppsoorienterad psykoterapi – teoretisk bakgrund och klinisk tillämpning. Natur och Kultur. Centraltryckeriet Borås 1997.
- Dworkin SH, Kerr BA. (1987). Comparison of interventions for women experiencing body image problems. *Journal of Counseling Psychology*; 34, 136-140.
- Ekman S-L. (1993). Monolingual and bilingual communication between patients with dementia diseases and their caregivers. Dissertation from the Department of Advanced Nursing, University of Umeå, Sweden. ISBN 91-7174-785-0.
- Ekselius L, Bengtsson A & von Knorring L. (1998). Personality traits as determined by means of the Karolinska Scale of Personality (KSP) in patients with fibromyalgia. *Journal of Musculoskeletal Pain*; 6: 35-49.

- Ellis R. (2001). Movement metaphor as mediator: a model for the dance/movement therapy process. *Arts in Psychotherapy*; 28: 181-190.
- Epstein SA, Kay G, Clauw D, Heaton R, Klein D, Krupp L, Kuck J, Leslie V, Masur D, Wagner M, Waid R, Zisook S. (1999). Psychiatric disorders in patients with fibromyalgia. A multicenter investigation. *Psychosomatics*; 40: 57-63.
- Ericsson K, Hilleras P, Sundell ML, Winblad B. (1997). Human Figure Drawings from age 4 to 104 and in people with impaired cognition. *Int J of Practical Appr to Disability*; 21: 8-13.
- Ericsson K, Winblad B, Nilsson L-G. (2001). Human-figure drawing and memory functioning across the adult life span. *Archives of Gerontology and Geriatrics*; 32: 151-166.
- Fabian TJ, Dew MA, Pollock BG. (2001). Endogenous concentrations of DHEA-S and DHEA-S decrease with remission of depression in older adults. *Biol Psychiatry*; 15: 767-774.
- Fava GA, Freyberger H, Bech P, Christodoulou G, Sensky T, Theorell T, Wise TN. (1995). Diagnostic criteria for use in psychosomatic research. *Psychther Psychosom*; 63: 1-8.
- Forseth KO, Gran JT. (1992). The prevalence of fibromyalgia among women aged 20-49 years in Arendal, Norway. *Scand J of Rheumatol*; 21: 74-78.
- Freud S. (1995). Jaget och detet. I Valda skrifter av Sigmund Freud. (Översättn. Ola Andersson). Stockholm. Natur och Kultur.
- Frith S. (2004). Why does music make people so cross? *Nordic Journal of Music Therapy*; 13: 64-69.
- Gabrielsson A. (2002). Emotion perceived and emotion felt: same or different? European Society for the cognitive Sciences of Music 2002. *Musicae Scientiae*, Special issue 2001-2002: 123-147.
- Gaston-Johansson F, Gustafsson M, Felldin R, Sanne H. (1990). A comparative study of feelings, attitudes and behaviors of patients with fibromyalgia and rheumatoid arthritis. *Soc Science Med*; 31: 941-947.
- Goodenough FL. The measurement of Intelligence by Drawings. World Book Company, New York. 1926.
- Goldenberg DL. (1996). Fibromyalgia, chronic fatigue syndrome and myofascial pain. *Curr Opin Rheumatol*; 8: 113-123.
- Griep EN, Boersma JW, de Kloet ER. (1993). Pituitary release of growth hormone and prolactin in the primary fibromyalgia syndrome. *J Rheumatol*; 21: 2125-2130.
- Griep EN, Boersma JW, Lentjes EG. (1998). Function of the hypothalamic-pituitary-adrenal axis in patients with fibromyalgia and low back pain. *J Rheumatol*; 25: 1374-1381.
- Grönlund E, Lumsden M (1991). Psykosomatik och dansterapi [Psychosomatics and Dance/movement therapy] In Konarski K, Theorell Y (eds.), Psykosomatisk Läkekonst (pp. 158-182). Stockholm Sweden, Natur och Kultur.
- Grönlund E. (1994). Barns känslor bearbetade i dans. Dansterapi för barn med tidiga störningar [Childrens' emotions treated in dance. Dance/movement therapy for

- children with early mental disorders] Dissertation. Stockholm: Department of Education. Stockholm University. ISBN 91-7153-274-9.
- Grönlund E. (1999) in *Konstnärliga terapier; bild, dans och musik i den läkande processen.* (pp. 74-81). [Creative Arts: art, dance and music in the healing process.] (eds. Grönlund, Alm, Hammarlund). Natur och Kultur.
- Grönlund E, Renck B. (2004). Dansterapi – en målinriktad behandling som stöd och hjälp för pojkar med diagnosen ADHD/DAMP. [Dance/movement therapy – a goal oriented supportive and helpful treatment for boys with ADHD/DAMP.] Danshögskolan, Nämnden för konstnärligt utvecklingsarbete. ISSN 1652-3776. 2004:1
- Gunnar MR, Vasquez DM. (2001). Low cortisol and a flattening of expected daytime rhythm: potential indices of risk in human development. *Dev Psychopathol*; 13 : 515-538.
- Gustavsson JP, Bergman H, Edman G, Ekselius L, von Knorring L, Linder J. (2000). Swedish universities Scales of Personality (SSP): construction, internal consistency and normative data. *Acta Psychiatr Scand*; 102: 217-225.
- Hacking S, Foreman D, Belcher J. (1996). The descriptive assessment for psychiatric art. A new way of quantifying paintings by psychiatric patients. *Journal of Nervous Mental Disorders*; 184: 425-430.
- Hadler NM, Ehrlich GE. (2003). Fibromyalgia and the conundrum of disability determination. *J Occup Environ Med*; 45: 1030-1033.
- Hanna JL. (1987) *To dance is human: Theory of nonverbal communication.* Chicago: University of Chicago press.
- Hanna JL. (1995). The Power of Dance: Health and Healing. *J of Alternative and Complementary Medicine*; 1: 323-331.
- Harrer G, Harrer H. (1977). Music, Emotion and Autonomic Function. In *Music and the Brain.* Critchley M, Henson RA (eds). William Heinemann Medical Books limited. London.
- Havnesköld L, Risholm Mothander P (1995). *Utvecklingspsykologi - psykodynamisk teori i nya perspektiv.* Falköping Liber 1999.
- Heim C, Newport DJ, Bonsall R, Miller AH, Nemeroff CB (2001). Altered pituitary-adrenal- axis responses to provocative challenge tests in adult survivors of childhood abuse. *Am J Psychiatry*; 158: 575-581.
- Hellhammer DH, Wade S. (1993). Endocrine correlates of stress vulnerability. *Psychother Psychosom*; 60: 8-17.
- Hellström O, Bullington J, Karlsson G, Lindqvist P, Mattsson B. (1999). A phenomenological study of fibromyalgia. Patients perspectives. *Scand J Prim Health Care*; 17: 11-16.
- Henriksson C. (1995). *Living with fibromyalgia. A study of the consequences for daily activities.* Linköping University Medical Dissertation No 445, Department of Caring Sciences. ISBN 91-7871-297-1.
- Hidding A, van Santen M, De Klerk E, Gielen X, Boers M, Geenen R, Vlaeyen J, Kester A, van der Linden S. (1994). Comparison between self-report measures and clinical observations of functional disability in ankylosing spondylitis, rheumatoid arthritis and fibromyalgia. *J Rheumatol*; 21: 818-23.

- Hudson JI, Goldenberg DL, Pope HG, Keck PE, Schlesinger L. (1992). Comorbidity of fibromyalgia with medical and psychiatric disorders. *Am J Med*; 92: 363-367.
- Hyypä M, Lindholm T, Kronholm E & Lehtinen V. (1990). Functional insomnia in relation to alexithymic features and cortisol hypersecretion in a community sample. *Stress Medicine*; 6: 277-283.
- Jacob I, Hardi I. (1992). Psychopathology of expression and art therapy in the world. The Budapest SIPE Colloquium.
- Johnson J, Paananen ML, Rahinanti P, Hannonen P. (1997). Depressed fibromyalgia patients are equipped with an emphatic competence dependent self-esteem. *Clin Rheumatol*; 16: 578-584.
- Katon W, Sullivan M, Walker E. (2001). Medical symptoms without identified pathology: relationship psychiatric disorders, childhood and adult trauma, and personality traits. *Ann Intern Med*; 134: 917-925.
- Kestenberg J. (1975). Children and Parents: Psychoanalytic studies in development. New York, Jason Aronsson.
- Kihlstrom JF, Kihlstrom LC. (1999). Self, sickness, somatization, and systems of care. In Self, social identity, and physical health. (pp. 23-42). Contrada RJ and Ashmore RD (eds.) Oxford University Press.
- Kolb B. (1985). Fundamentals of Human Neuropsychology. W. H. Freeman and Company. (2nd ed.) New York.
- Konarski K. (1991). Känslodifferentieringsterapi. Ett utvecklingspsykologiskt perspektiv på differentiering av känslor vid alexithyma tillstånd. Ur Psykosomatisk läkekonst (pp. 43-75). Theorell T, Konarski K. (eds). Natur och Kultur . Sweden.
- Kooiman CG, van Rees Vellinga S, Spinhoven P, Draijer N, Trijsburg RW, Rooijmans HG. (2004). Childhood adversities as risk factors for alexithymia and other aspects of affect dysregulation in adulthood. *Psychother Psychosom*; 73: 107-116.
- Kosek E, Ekholm J, Hansson P. (1996). Sensory dysfunction in fibromyalgia patients with implications for pathogenic mechanisms. *Pain*; 68: 375-383.
- Kristensson-Uggla B. (1994). Kommunikation på bristningsgränsen. En studie i Paul Ricoeurs projekt. Stockholm/Stehag: Brutus Östlings Bokförlag Symposion. ISBN 91-7139-214-9.
- Lacey JH, Birtchnell SA. (1986). Body-image and its disturbances. *Journal of Psychosomatic Research*; 30, 623-631.
- Langius A. (1995). Quality of Life in a group of patients with Oral and Pharyngeal Cancer. Sense of Coherence, Functional Status and Well-being. Dissertation from the Dep. of Medicine, the Center of Caring Sciences North. Karolinska Institute, Karolinska Hospital. Stockholm. Sweden.
- Landis CA, Lentz M, Rothermel J, Riffle S, Chapman D, Buchwald D, Shaver J. (2001). Decreased nocturnal levels of Prolactin and growth hormone in women with fibromyalgia. *The J of Clin Endocrin & Metabolism*; 86: 1672-1678.
- Large R, Butler M, James F, Peters J. (1990). A systems-model of chronic musculoskeletal pain. *Australian and New Zealand Journal of Psychiatry*; 24: 529-536.

- Lautenbacher S, Thomas A, Roscher S, Strian F, Pirke KM, Krieg JC. (1992). Body size perception and body satisfaction in restrained and unrestrained eaters. *Behaviour Research & Therapy*; 30, 243-250.
- Lautenbacher S, Kraehe N, Krieg JC. (1997). Perception of body-size and body satisfaction in recovered anorexic women: comparison with restrained eaters. *Perceptual and Motor Skills*; 84, 1331-1342.
- Lerner M. (1999). Psykosomatik - Kroppens och själens dialog. [Psychosomatics – a body – mind dialogue]. Stockholm, Natur och Kultur.
- Lev-Wiesel R, Shvero T. (2003). An exploratory study of self-figure drawing of individuals diagnosed with schizophrenia. *Arts in Psychotherapy*; 30: 13-16.
- Levine SK. (1996). The expressive body: a fragmented totality. *The Arts in Psychotherapy*; 23: 131-136.
- Lewis P. (1986). Object relations and self psychology within psychoanalytic and Jungian dance/movement therapy. In Lewis P (ed). *Theoretical Approaches in Dance-Movement-Therapy*. Vol. II. Iowa, Kendall / Hunt Publishing Company.
- Lewis R, Scannell E. (1995). Relationship of body image and Creative Dance Movement. *Perceptual and Motor Skills*; 81: 155-160.
- Levy F. (1992). *Dance Movement Therapy- A Healing Art*. American Alliance for Health. Physical Education, Recreation, and Dance. Reston Virginia 1988.
- Lumley MA, Asselin LA, Norman S. (1997). Alexithymia in chronic pain patients. *Compr Psychiatry*; 38: 160-165.
- Lundberg U. (2002). Gender, multiple roles and physiological reactions. In S Wamala and J Lynch (Eds.), *Gender and Social Inequalities in Health* (pp 121-155). Stockholm, Studentlitteratur.
- Luria R. (1970). The functional organization of the brain. *Scientific America*; 222: 66-78.
- Malt U. (1995). Psykosomatisk medisins hitorie. I Sivik T. & Theorell T. (eds). *Psykosomatisk Medicin*. Lund, Studentlitteratur.
- Malt E. (2002). Psychobiology of fibromyalgia. A study of women with fibromyalgia compared to female patients with functional dyspepsia and female population based random sample control. Doctoral thesis from the Department of Psychiatry, Haukeland University Hospital, Bergen, University of Bergen and Department of Biological and Medical Psychology, University of Bergen, Norway. ISBN 82-7788-128-2.
- Marsden CD. (1986). Movement disorders and the basal ganglia. *Trends in Neurosciences*; 9: 512-514.
- Matto H. (2002). Investigating the validity of the Draw-A-Person: Screening procedure for emotional disturbance: A measurement validation study with high risk youth. *Psychological Assessment*; 14: 221-225.
- McDougall J. (1990). Kroppens teatrar. Psykosomatiska sjukdomar i ett psykoanalytiskt perspektiv. [Theatres of the body.] Stockholm. Natur och Kultur 1989.
- Meekums B. (2002). *Dance Movement Therapy: A Creative Psychotherapeutic Approach*. London, Thousand Oaks, CA, Sage Publications.

- Mengshoel AM, Vollestad NK, Forre O. (1995). Pain and fatigue induced by exercise in fibromyalgia patients and sedentary healthy subjects. *Clin Exp Rheumatol*; 13: 477-482.
- Merleau Ponty M. (1996). Phenomenology of Perception. Routledge & Kegan Paul Ltd. ISBN 0-415-04556-8.
- Meyer G. (1999). An exploratory study of the theory and technique of five expressive art therapy modalities. A Dissertation, Faculty of the California School of Professional Psychology at Alameda. Dissertation Abstracts International: Section B: the Sciences and Engineering. AAT 9918493.
- Montgomery S, Åsberg M. (1979). A new depression scale designed to be sensitive to change. *Brit J Psychiat*; 134: 382-389.
- Moore CL, Yamamoto K (1988). Beyond words Movement observation and analysis. Philadelphia, Pennsylvania, Gordon & Breach Science Publishers.
- Morin C, Bensalah Y. (1998). The self portrait in adulthood and aging. *Int J Aging and Human Develop*; 46: 45-70.
- Munglani R, Hudspith MJ, Hunt SP. (1996). The therapeutic potential of neuropeptide Y. Analgesic, anxiolytic and antihypertensive. *Drugs* 52; 371-389.
- Neeck G, Crofford LJ. (2000). Neuroendocrine perturbations in fibromyalgia and chronic fatigue syndrome. *Rheum Dis Clin North Am*; 26: 989-1002.
- North TC. (1988). The effect of exercise on depression: A meta-analysis. Doctoral dissertation, University of Colorado at Bolder, 1988. Dissertation Abstracts International 49, 5027B.
- Nyström K. (2002). Dance on the border. Communication in dance therapy with persons afflicted with dementia. Doctoral dissertation from the Department of Education, Stockholm University, Sweden. Printed in Sweden by Akademityck, Edsbruk. ISBN 91-7265-431-7.
- Offman H, Bradley S. (1992). Body image of children and adolescents and its measurement: an overview. *Can J Psychiatry*; 37: 417-422.
- O'Callaghan CC. (1996). Pain, music creativity and music therapy in palliative care. *The Am J of Hospice and Palliative Care*; march/april: 43-49.
- Oquendo MA, Echavarria G, Galfalvy HC, Grunebaum MF et al. (2003). Lower cortisol levels in depressed patients with comorbid post-traumatic stress disorder. *Neuropsychopharm*; 28: 591-598.
- Papciak AS, Feuerstein M, Belar CD, Pistone L. (1986). Alexithymia and pain in an outpatient behavioural medicine clinic. *Int J Psychiatry Med*; 16: 347-357.
- Peolsson M. (2001). Smärtans mosaic. Kommunikation och lärande om långvarig smärta. Dissertation. Institutionen för Tema Kommunikation. Linköpings Universitet, Sweden. ISBN 91-7373-214-1.
- Perry BD. (1997). Incubated in Terror: Neurodevelopmental factors in the "cycle of violence" in Children, Youth and Violence: The search for solutions pp. 124-148. (J Osofsky Ed). Guilford Press, New York.
- Pillemer SR, Bradley LA, Crofford LJ, Moldofsky H, Chrousos GP. (1997). The neuroscience and endocrinology of fibromyalgia. *Arthritis Rheum*; 40: 1928-1939.

- Reich W. (1972). *Character Analysis*. New York: The Noonday Press.
- Ricoeur P. (1976). *Interpretation theory: Discourse and the surplus of meaning*. Fort Worth. Texas Christian University Press.
- Ricoeur P. (1988). *Från text till handling*. Brutus Östlings Bokförlag Sympsion. Stockholm.
- Ritter M, Graff Low K. (1996). Effects of dance movement therapy: A meta-analysis. *The Arts in Psychotherapy*; 23: 249-260.
- Rosmond R, Bjorntorp P. (2000). Low cortisol production in chronic stress. The connection stress-somatic disease challenge for future research. *Lakartidningen* 20; 97: 4120-4.
- Ruud E. (1998). *Music therapy: Improvisation, communication and culture*. Barcelona Publishers, Gilsum.
- Russel IJ, Michalek JE, Vipraio GA, Fletcher EM, Javers MA, Bowden CA. (1992). Platlet 3H-imipramine uptake receptor density and serum serotonin levels in patients with fibromyalgia/fibrositis syndrome. *J Rheumatol*; 19: 104-109.
- Russel IJ, Orr MD, Littman B, Vipraio GA, Alboukrek D, Michalek JE, Lopez Y, MacKillip F (1994). Elevated cerebrospinal levels of substance P in patients with fibromyalgia syndrome. *Arthritis Rheum* 37: 1593-1601.
- Scaer R.C. (2001). The Neurophysiology of Dissociation and Chronic Disease. Published in: *Applied Psychophysiology and Biofeedback*; 26: 73-91.
- Schilder P. (1970). *The image and appearance of the human body* (pp 208). New York, International Universities Press. Copyright 1950.
- Schiöler A. (1989). Alexithymi och kroppskänedom hos patienter med kronisk smärta. *Sjukgymnasten*; 1: 14-17.
- Schmais C. (1981). Group development and group formation in dance therapy. *Arts in Psychotherapy*; 8: 103-107.
- Schmais C. (1985). Healing processes in group dance/movement therapy. *American J of Dance Therapy*; 8: 17-36.
- Schmais C. (1998). Understanding the dance/movement therapy group. *American J of Dance Therapy*; 20: 23-35.
- Schmeil C. (2004). Dance/movement therapy with women and children suffering from domestic violence. In colloquium Brochure, First International Research Colloquium in Dance/movement therapy 13 – 14 feb. 2004. Berufsverband der Tanztherapeutinnen Deutschlands.
- Schorr JA. (1993). Music and pattern change in chronic pain. *Adv Nurs Sci*; 15: 27-36.
- Schubert E. (2001). Continuous measurement of self-report emotional response to music. In Juslin Patrik N. & Sloboda John A. (Eds). *Music and Emotion. Theory and Research*. New York: Oxford University Press.
- Sifneos PE. (1973). The prevalence of alexithymic characteristics in psychosomatic patients. *Psychother Psychosom*; 22: 255-262.
- Sifneos P. (1967). Clinical observations on some patients suffering from a variety of psychosomatic diseases. In: *Proceedings of the seventh European conference on psychosomatic research*, Karger, Basel.

- Simms RW. (1998). Fibromyalgia is not a muscle disorder. *Am J Med Sci*; 315: 346-350.
- Sivik T. (1992). Diagnosis and treatment of patients with idiopathic back pain. Doctoral Dissertation from the Department of Primary Health Care. University of Göteborg, Sweden. ISBN 91-628-0580-0.
- Sivik T. (1993). Alexithymia and hypersensitivity to touch and palpation. *Integr Physiol Behav Sci*; 28: 130-136.
- Sivik T (1995). (1990). Dynamisk psykoterapi. Del 2. Diagnos – psykopatologi – behandlingsteknik. Studentlitteratur. Lund.
- Sivik T. (2004). Ur rapport om psykosomatologi och psykosomatisk integrativ behandling och rehabilitering. Medlemsblad Svensk Förening för Psykosomatisk Medicin. Nr 1 Febr. 2004.
- Smith ML, Glass GV. (1977). Meta-analysis of psychotherapy outcomes studies. *American Psychologists*; 32: 752-760.
- Spielholz P, Silverstein B, Morgan M, Checkoway H, Kaufman J. (2001). Comparison of self-report, video observation and direct measurement methods for upper extremity musculoskeletal disorder physical risk factors. *Ergonomics*; 44: 588-613.
- Stanton-Jones K. (1992). An introduction to dance movement therapy in psychiatry. Ta Vistock/Routledge New York.
- Stern D. (1985). Spädbarnets interpersonella värld ur psykoanalytiskt och utvecklingspsykologiskt perspektiv. Lund, Natur och Kultur 1991.
- Svanborg P, Åsberg M. (1994). A new self-rating scale for depression and anxiety states based on the Comprehensive Psychopathological Rating Scale. *Acta Psychiatr Scand*; 89: 21-28.
- Söndergaard HP, Hansson LO, Theorell T. (2002). Elevated blood levels of dehydroepiandrosterone sulphate vary with symptom load in posttraumatic stress disorder: findings from a longitudinal study of refugees in Sweden. *Psychother Psychosom* ; 71: 298-303.
- Söndergaard HP, Theorell T. (2003). A longitudinal Study of Hormonal Reactions Accompanying Life Events in Recently Resettled Refugees. *Psychother Psychosom*; 72: 49-58.
- Taylor GJ, Bagby RM. (2004). New trends in Alexithymia research. *Psychother Psychosom*; 73: 68-77.
- Teszary (1991). Psykodrama som metod i psykosomatiskt arbete. In Theorell T, Konarski K (Eds.), *Psykosomatisk Läkekunst* (pp. 183-185). Natur och Kultur, Stockholm, Sweden.
- Tharinger DJ, Stark K. (1990). A qualitative versus quantitative approach to evaluating the Draw-A-Person and Kinetic Family Drawing: A study of mood- and anxiety- disorder children. *Psychological Assessment*; 2: 365-375.
- Theorell T. (1992). Prolactin – a hormone that mirrors passiveness in crises situations. *Integr Physiol Behav Sci*; 27: 32-38.
- Theorell T, Konarski K, Burell A, Engström R, Lagercrantz A, Teszary J, Thulin K, de la Torre B. (1995). Konstpsykoterapi vid långvariga psykosomatiska sjukdomstillstånd. Statens Institut för Psykosocial Miljömedicin. Sektionen för

- Stressforskning. Karolinska Institutet, Stress Research Reports Nr 259. Stockholm, Sweden.
- Theorell T, Konarski K, Engström R, Lagercrantz AM, Teszary J, Thulin K. (1998a). Theorell T (ed). När orden inte räcker. Läkning av psykosomatisk sjukdom genom terapeutiskt arbete med musik, dans, bild och psykodrama. Natur och Kultur.
- Theorell T, Konarski K, Westerlund H et al. (1998b). Treatment of Patients with Chronic Somatic Symptoms by means of Art Psychotherapy: A Process Description. *Psychother Psychosom*; 67: 50-56.
- Thulin K. (1995). Dansterapi. Danspsykoterapi som behandling för psykosomatiska patienter. (pp. 31-49). Ur Theorell T, Konarski K, Burell A, Engström R, Lagercrantz A, Teszary J, Thulin K, de la Torre B. Konstpsykoterapi vid långvariga psykosomatiska sjukdomstillstånd. Statens Institut för Psykosocial Miljömedicin. Sektionen för Stressforskning. Karolinska Institutet, Stress Research Reports Nr 259. Stockholm, Sweden.
- Thulin K. (1998). Dansterapi. Theorell T (ed). Ur När orden inte räcker. Läkning av psykosomatisk sjukdom genom terapeutiskt arbete med musik, dans, bild och psykodrama. (pp. 59-93). Natur och Kultur.
- Turk DC, Okifuji A. (1997). Evaluating the role of physical, operant, cognitive and affective factors in the pain behaviors of chronic pain patients. *Behav Modif* ; 21: 259-80.
- Ursin H. (1995). Psykosomatikk: Ett psykobiologiskat perspektiv. I Sivik T. & Theorell T. (eds). Psykosomatisk Medicin. Lund, Studentlitteratur.
- Ursin H (2000). Psychosomatic medicine: State of the Art. *Annals of Medicine*; 32: 323-328.
- Vaeroy H, Nyberg F, Terenius L. (1991). No evidence for endorphin deficiency in fibromyalgia following investigation of cerebrospinal fluid (CSF) dynorphin A and Met-Enkephalin-Arg6-Phe7. *Pain*; 46: 139-143.
- van der Kolk BA. (1994). The body keeps the score: Memory and the evolving psychobiology of posttraumatic stress. *Harvard Review Psychiatry*; 1: 253-265.
- Vandvik IH, Forseth K. (1994). A bio-psychosocial evaluation of ten adolescents with fibromyalgia. *Acta Paediatr*; 83: 766-771.
- Walker EA, Keegan D, Gardner G, Sullivan M, Katon WJ, Bernstein D (1997a). Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: I. Psychiatric diagnosis and functional disability. *Psychosom Med*; 59: 565-571.
- Walker EA, Keegan D, Gardner G, Sullivan M, Katon WJ, Bernstein (1997b). Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: II Sexual, physical and emotional abuse and neglect. *Psychosom Med*; 59: 572-579.
- Wang H-X, Ericsson K, Winblad B, Fratiglioni L. (1998). The Human Figure Drawing test as a screen for dementia in the elderly: A community-based study. *Archives of gerontology and Geriatrics*; 27: 25-34.
- Warah A. (1989). Body image disturbance in anorexia nervosa: Beyond body image. *Canadian Journal of Psychiatry*; 34: 898-905.

- Waylonis GW, Perkins RH. (1994). Post-traumatic fibromyalgia. A long-term follow-up. *Am J Phys Med Rehab*; 73: 403-412.
- Wikström B-M, Theorell T, Sandström S. (1993). Medical health and emotional effects of Art stimulation in old age. *Psychother Psychosom*; 60: 195-206.
- Winnicott DW. (1997). Lek och verklighet [Playing and reality]. (1971). Stockholm, Natur och Kultur. Centraltryckeriet Borås 1997.
- Wolf F, Ross K, Anderson J, Russel IJ, Hebert L. (1995). The prevalence and characteristics of fibromyalgia in the general population. *Arthritis Rheum*; 38: 19-28.
- Wolfe F, Smythe HA, Yunus MB, Bennet RM, Bombardier C, Goldenberg DL, Tugwell P, Cambell SM, Abeles M, Clark P, Fam AG, Farber SJ, Fichtner JJ, Franklin CM, Gatter RA, Hamaty D, Lessard J, Lichtbroun AS, Masi AT, Mc Cain GA, Reynolds WJ, Romano TJ, Russell IJ, Sheon RP. (1990). The American college of Rheumatology 1990 criteria for the classification of fibromyalgia: Report of the multicenter criteria committee. *Arth Rheum*; 33: 160-172.
- Yehoda R, Resnick H, Kahana B, Giller EL. (1994). Long-lasting hormonal alterations to extreme stress in humans: normative or maladaptive. *Psychosom Med*, 56: 287-297.
- Yunus MB, Masi AT, Aldag JC. (1989a). A controlled study of primary fibromyalgia syndrome: clinical features and association with other functional syndromes. *J Rheumatol Suppl*; 19: 62-71
- Yunus MB, Kalyan-Raman UP, Masi AT, Aldag JC. (1989b). Electron microscopic studies of muscle biopsy in primary fibromyalgia syndrome: a controlled and blinded study. *J Rheumatol*; 16: 97-101.
- Yunus MB, Dailey JW, Aldag JC, Masi AT, Jobe PC. (1992). Plasma tryptophan and other amino acids in primary fibromyalgia: a controlled study. *J Rheumatol*; 19: 90-94.

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