RELATIONSHIPS BETWEEN BODILY CHARACTERISTICS AND MENTAL ATTITUDES: BODILY EXAMINED AND SELF ASSESSED RATINGS OF ILL HEALTH

Kina Meurle-Hallberg
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Department of Psychology
Umeå University
SE-901 87 Umeå, Sweden

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ABSTRACT

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The present thesis investigates the psychometric properties and clinical relevance of the Resource Oriented Body Examination and its capacity to provide a useful assessment tool in patients whose symptoms appear to contain associations between psychological and physical problems.

Our aims were to find out if an early version of the Resource Oriented Body Examination, ROBE I, could be reduced into a shorter version, labelled ROBE II. We also wanted to know if ROBE II would treat the variation of items in the different subscales in a way that provided for discrimination between groups of patients with psychosomatic, musculoskeletal and schizophrenic disorders compared to a group of non-patients. A total of 198 subjects were body examined with a ROBE I protocol. The sample data were entered into a separate factor analysis for each domain. Principal components with varimax rotations were used, and the first two factors for each domain were extracted. The original 254 variables were reduced to 144, constituting an instrument for body examination, ROBE II, with 10 subscales. All subscales showed satisfactory internal consistency. Within all but one of the domains the subscales showed acceptable intercorrelation. All subscales disclosed information of body patterns relevant for tracing psychosomatic symptoms in accordance with the Norwegian Psycho Motor Physiotherapy (NPMP). The subscales of ROBE II distinguished bodily characteristics of patients with psychosomatic, musculoskeletal and schizophrenic disorders.

Another research question in this study was: how do patients with stress-related behavior and somatoform disorders assess their symptoms and self-image compared to healthy individuals, and how are these assessments related to bodily resources, assessed with a physiotherapeutic body examination?

The test group (n=31) consisted of consecutive patients referred to a treatment center specializing in psychosomatic problems. Significant differences (p≤0.01) were found between the test and comparison groups (n=22) on all but two of the ten subscales of the Resource-Oriented Body Examination (ROBE II). This was also the case for all the subscales of The Symptom Checklist-90 (SCL-90) (comparison groups n=52), and for all but three of the eight clusters of the Structural Analysis of Social Behavior (SASB) (comparison groups n=52). For the patient group, the ROBE II subscale Increased respiratory control correlated significantly with the SCL-90 subscales that measures Anger-hostility, Phobic anxiety, Paranoid ideation, with the Personality Severity Index (PSI) and with the SASB clusters Daydreaming and self-neglect, Self-indictment and oppression with r's between 0.38 and 0.50. Body examination with ROBE II might provide a useful assessment tool in patients whose stress-related problems appear to contain associations between psychological and physical problems.

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Relationships between bodily characteristics and mental attitudes: Bodily examined and self-assessed ratings of ill health

Kina Meurle-Hallberg

BACKGROUND

The origin of this thesis stretches back to 1982 when a treatment alternative aimed at reducing the suffering among patients with psycho-somatic, somatoform and stress related ailments was initiated at Falun Hospital, Sweden. A department for Movement, Art and Music therapy was organized and a physiotherapeutic treatment model, “psycho-somatic movement therapy” was introduced. The movement-therapy consists of an assessment and evaluation carried out using the instruments ROBE I and Body-history, an interview where the psycho-social impact of the patients symptoms are traced in the patient’s related account of his/her life story. The treatment is based on various techniques for training of bodily awareness and dialogued communication, in a group or individually (Meurle-Hallberg, 1993; Meurle-Hallberg & Gunnerius, 1990). Register data of patients with non specific symptoms of psycho-somatic dysfunctions referred to the clinic for the years between 1988 and 1996 (n =724) showed that 62 % of the patients were between 35 and 55 years and that 75 % were women. About half of the population, 52 %, had had some earlier contact with psychiatry, but registered referrals represented the hospital at large. The average treatment time was two years (Meurle Hallberg, 1998). Results from register data and a questionnaire answered by 156 patients showed that the patients’ referrals concerned a wide variety of physical as well as psychological disturbances that could be coded in four crude groups. The referrals for all the patients were due to their psycho somatic ailments.

1. Unspecific psychological disturbances such as anxiety, lack of initiative, lack of confidence in oneself, sleeping disturbances etc. (35%, n= 54).

2. Specific psychological disturbances (anorexia, alexithymia, schizophrenia simplex, manic-depressive disorder etc. (8% n= 12).

3. Diffuse somatic problems: problems from the neck, shoulders, arms, tension headache, tension related vertigo, sweating, palpitations, vomiting, joint problems, generalized pain syndrome, gastro-intestinal disturbances, (37% n =58).

4. Specific somatic problems: Diagnostically speaking this is a heterogeneous group with diagnoses of cancer, cardiovascular disease, asthma, whiplash and likewise . (20%, n =32) (Meurle-Hallberg, 1993).

Questions concerning assessment and treatment of patients with psychosomatic problems, somatoform disorders and stress-related illnesses became subject for observation and evaluation in the work group. The staff experienced that most of the patients symptoms included lacking bodily resources with respect to respiration, posture and muscle tension as well as to mental health problems and self-image, and therefore data were gradually gathered during the 90s with a view to undertaking a systematic project to study the prevalence of these phenomena among patients referred to the department (Meurle-Hallberg, 2000).
The psyche-soma complex
The early use of the concept psycho-somatic was to describe physical signs appearing due to sleeplessness (Pies, 2005) and later evolved to include various forms for research elaborating relationships between emotions and diseases. Freud tried to explain the “puzzling leap from the mind to the body” by offering a psycho-analytic method where different types of neuroses could be diagnosed and cured as the defence system of repressed emotional conflicts became dissolved from the unconscious, and could be communicated with the use of language (Gay, 1990). The notion of psychogenetic origin in somatically expressed symptoms was dominant in the psychosomatic medicine of the 1950s, where constellations between physiological vulnerability and personality traits were described. A psychosomatic disease panorama, consisting of the "psychosomatic seven" (including peptic ulcer, asthma, hypertension and, depending on the psychosomatic contexts, colitis, cardiac arrhythmia, neurodermatitis, and hyperthyroidism) was claimed (Cullberg, 1985; Ottersson, 1983). In the 1960s and 70s focus shifted from psychoanalysis and psychotherapy as new use was made of psycho-social-biological research. Cannon described how the biological organism prepared for fight or flight in response to emotions of anger and fear and Seyle presented his research on the "stress-syndrome" and theories of systems of general adaptation (GAS). A psychobiological rather than analytical perspective was introduced where manifest emotions, impact of life-changes and the socio-environmental factors were brought to attention rather than a psychodynamic perspective dealing with emotional experiences derived from childhood (Brown, 2000; Theorell, 2003). Physiological reactions to conservation-withdrawal were considered in terms of depressive moods where failure to successfully adapt to the demands of the environment could be reorganized using cognitive approaches in terms of behavioural and psycho-therapeutical therapies (Nesse, 2000).

Diagnostical systems such as DSM IV use concepts of somatoform diseases to describe states of ill health earlier described as psycho-somatic (Hiller & Janca, 2003). The predominance of psychodynamic psychotherapy was gradually superseded by a variety of cognitive behavioural self-help techniques for stress management, coping strategies to handle feelings of loss and loneliness as well as by cognitive psychotherapy, all of which were followed by an increased use of psychopharmacological support (Theorell, 2003). Lately, mindfulness-training techniques have become an option for psychologists, working to facilitate the cognitive capacities of their patients (Nordin, 1999).

This field of knowledge is of mutual concern within the area of psycho-somatic/psychiatric physiotherapy.

Psycho-somatic and psychiatric physiotherapy
It belongs to common practise of physiotherapists working within psychiatric and primary health units to assess and treat patients with psychomotor disturbances. A special section for psycho/somatic and psychiatric physiotherapy of the society for registered physiotherapists (Legitimerade Sjukgymnasters Riksförbund, LSR) was formed during the 80:ies in Sweden, and registered physiotherapists have acquired extended competence in psychosomatic/psychiatric physiotherapy (Mattsson, 1998). Body Awareness Therapy (BAT) founded by Roxendal (Roxendal, 1985) is the main influence of the Swedish tradition. BAT is the common name for a number of body-oriented physiotherapeutic approaches using a holistic perspective in physiotherapy treatment directed towards awareness of how the body is used, concerning body function, behaviour and interaction with the self and others (Lundvik Gyllensten, 2001).

In Norway psychosomatic/psychiatric physiotherapy, NPMP, from the 50s onward developed in cooperation between physicians and physiotherapists, and later became a postgraduate program. NPMP is not specifically aimed towards diagnoses or symptoms but aims to accomplish a general redirection of bodily dysfunction working on muscle tension
and postural alignment to free respiration and movements. In NPMP the treatment aims at
facilitating the natural restoration of self-regulatory capacities of bodily functions as well as
blocking corresponding emotions from hindering their pathways. Emphasis is placed on
providing space for repressed affects to appear and regain their representation in the bodily
communication, and the psychomotor therapist is trained to help the patient verbalize
conflicts and frustrations (Bunkan, 2001).

In Denmark the skills required for specialist qualification within the field for
psychiatric/ psychosomatic physiotherapy has recently been made explicit. Summarizing the
contents of the Scandinavian field for psychiatric/ psychosomatic physiotherapy, in order to
qualify to give individual and group treatment with NPMP and /or BAT, its practitioners are
asked to be able conduct a clinical body examination elaborated within the field of NPMP,
to be able to evaluate the patients resources and potentials for development in relation to
his/hers capacity for body awareness, body functioning and body movement, and to be able
to treat the patient with the use of verbal and nonverbal communication as ones
therapeutical interventions. Furthermore, attention is given to the physiotherapists’
capacity to use clinical reflexivity in dialogued and documented communication, so that the
patient can become actively involved in feeling, reflecting and thinking in a process of
integrating a higher level of functioning in the bodily capacity for self-regulation.

The physiotherapist’s ability to involve the patient in a subject-to-subject meeting as
well as to motivate and support him/her during the treatment process is considered
important. Since the field of psychiatry/psychosomatics is characterized by multi-layering
and complexity, it is important that the physiotherapist is well informed of current
professional knowledge and is able to access its support (Blom, Jensen, Kleinert, Thögersen,
& Sörensen, 2004; Gard & Gyllensten, 2000; Gard, Gyllensten Lundvik, Salford, &
Ekdahl, 2000).

This extended physiotherapeutic competence aims at assessing and treating patients
suffering from health problems that are most of the time fully or partly medically
unexplained, where patients are often referred as suffering from somatoform disorders,
including presence of physical symptoms and representing the expression of the bodily
aspect of emotion associated with anxious arousal such as muscular tension, faulty
respiration or sweating but also patients with psychiatric diagnoses of mental states affecting
the body such as eating disturbances, general anxiety disorders, insomnia as well as chronic
fatigue and post traumatic stress syndromes (Meurle-Hallberg, 1993).

**Signs and symptoms in psychiatric/psychosomatic physiotherapy**
Physiotherapists working within this context, using the patient’s body as an entrance for
the therapeutic work are daily faced with problems addressing *signs*, e.g. objective findings
observed by the clinician such as physical characteristics that can be assessed and measured
with the use of physiotherapeutic techniques for examining the body, as well as his/hers
*symptoms* of emotional disturbance, where the patients self-report must be relied upon,
often without objective tests available suited to the treatment situation.Signs and
symptoms, not always clearly defined, often overlap with one another and their
interpretation thus play a central role in the current conceptualization and communication
within the field (Holi, 2003; Mattsson, 1998; Rosberg, 2000). The physiotherapist uses
mainly bodily interventions for assessment and treatment of the patient. The treatment
situation requires of the therapist the capacity to make use of a binocular focus while on the
one hand working within a paradigm derived from the strict natural sciences of the medical
arena while simultaneously applying his/her experiences of the “lived body”, an entity
depicted from the phenomenological, existential perspective approaches in philosophy,
literature and art, using what is sometimes referred to as ones “Bodily Empathy” for
communication (Rudebäck, 1998; Skjaerven, Gard, & Kristoffersen, 2003).
Theoretical constructs of the NPMP: Reich and Braatoy

Wilhelm Reich
The NPMP treatment tradition had a psychoanalytic foundation starting with the influence of Wilhelm Reich who is often referred to as “the father of body therapy”. As a young psychoanalyst in Vienna during the 20s, Reich was heavily influenced by Freud’s ideas about how psychic energy is transformed and expressed as physiological experience when libidinal impulses become repressed and anxiety and neurosis develops (Boadella, 1985).

Reich contributed to psychoanalysis with his work on Character Analysis, where he elaborates the way in which neurotic character structure and repressed emotions are physiologically rooted in chronic muscle spasms. According to Reich, repressed memories and feelings were being suppressed by a process of continuous muscular holding. The feelings, thus rendered unavailable for consciousness, remained intact in the form of frozen impulses and became habitual, signaling their presence as of a chronic, sometimes spastic, pattern of contractions of the musculature. The totality of muscular holdings constitutes what Reich termed "muscular armoring". His second wife, Elsa Lindenburg, who was a movement therapist, influenced Reich in this shift to the body (Boadella, 1985; Lowen, 1958).

The psychiatrist Waal (Moe & Urdal, 1975) developed the Somatic Psycho-diagnostic method (WSP). In this examination method most of the attention was paid to eye contact, facial expressions, and to the body language-revelation of the patient’s capacity to relate to the therapist as he/she was examining the body. The domains used were posture, respiration, muscle tension and movements.

A psychological treatment method that grew out from Reich’s work is called Character Analyzed Vegeto-therapy (CAV) (Moe & Urdal, 1975). Here the therapist is focusing on the reactions from the vegetative system that take place during the psychotherapy. With CAV Reich postulated that one can observe diaphragmatic spasm, disturbances of breathing rhythm and muscle tone as well as vegetative disturbances in neurotic disturbances. “Muscular rigidity and psychic rigidity are a unit, they are the sign of a disturbance of the vegetative motility of the biological system as a whole” (Reich, 1972). During the early 40s Reich spent some of his time in Norway where his cooperation with psychiatrists and psychologists greatly affected the Norwegian tradition of bodily oriented therapies (Raknes, 1975).

Tryggve Braatöy
The psychoanalyst/neurologist Braatöy adapted Reich’s theories while studying neuro-psychological aspects of affect regulation in his patients with neurotic and psychotic disturbances. If repressed conflicts were managed by equally subconsciously conditioned reflexes, then psychoanalytically oriented therapy had to be considered also as a biological process where dependence on vegetative functions might be even more fundamental than dependence on verbal functions, (Braatöy, 1937).

In line with this thinking, posture is considered as a physical emotional attitude, where the affect is inhibited and contained within the postural pattern. In this perspective startle pattern is characterized by the conflict between fight-and-flight, where postural reflexes overtake and inhibit reflexes of movement - “should I stand or should I walk?” According to Braatöy, this is a posture characterized by elevated shoulders, arms rotated outwards and respiration blocked, preparing for action while, on the same time the muscles of the back (Latissimus dorsi) becomes activated, bringing abducted arms back into adduction. In his view, this is a situation of an emotional over-excitation resulting in an activation of the extra pyramidal system where the functions of posture and movement are inhibiting one another (Meurle-Hallberg, 1990).
According to Braatöy what is clinically observed is a registration of the patient’s anxiety prone attitude at the same time as an inhibition against this very attitude. Posture then mirrors a state of contradictions: one part of the personality feels and admits anxiety while on the same time another part is holding back, so that a physical defense is created that can be applied in a standing position where the postural, antigravital reflexes allow for this state to be maintained. In supine position however the same reflexes are not brought into action (Braatöy, 1947) and without the aid of keeping postural control over conflicts of anxiety, according to Braatöy, the patient is “left to his own devices”.

Braatöy was asking for a language of “bio-logics” to deal with symptoms, complained of by the patient as a physical dysfunction, but likewise understood by the doctor as lacking organic cause. In the treatment of these patients he felt it was necessary to make the patient recognize his muscular tensions and respiratory blockings, as well as the feelings they, in his view, concealed.

Therefore, in the early 40s Braatöy started his cooperation with the physiotherapist Aadel Bulow Hansen, work that founded the treatment technique that later came to be labeled psycho-motor treatment (Bunkan, Thornqvist, & Radoy, 1982).

Body examination in the NPMP treatment model
The NPMP includes a body examination performed according to a set schedule aiming at uncovering the patient’s psychomotor profile in terms of a patterned interplay between posture, respiration, and muscular tension, capacity for freedom of movement and for nonverbal communication. Commonly found body patterns are those of imbalance between flexion and extension in postural alignment, of muscular armoring around the chest resulting in decreased respiratory movement and subsequent patterns of hyper- and hypotonic muscular consistency. The body pattern emerging as a result of the examination gives comprehension of the patient’s resources to benefit from psychomotor treatment and is used to design the individual treatment (Thornqvist & Bunkan, 1991). The development of the Norwegian tradition of psychosomatic body examinations is depicted in Figure. 1.
The Resource Oriented Body Examination (ROBE)
Although the NPMP-tradition has many offsprings, three major branches have developed; Muscular Respiratory Diagnosis (MRD) (Johnsen, 1981), Global Physiotherapeutic Muscle Examination (GPM) (Sundsvold, Vaglum, & Denstad, 1982) and Resource Oriented Body Examination (ROBE) (Bunkan, 1996).

Using colors to register hypotonic qualities in muscles and respiration, Johnsen developed a diagnostic theory for the understanding of phase-specific arrest of psychological growth, made observable during palpation (Johnsen, 1968). In spite of the fact that her therapeutic method, MRD, has been internationally recognized (Bernhardt, 1991) there are, to our knowledge no empirical studies testing the psychometric capacities of her scheme of classification. In GPM, Sundsvold has provided an additional theory of muscle palpation, focusing on the stretch and pressure quality of the muscles and has also included the skin as a separate (fifth) body domain (Sundsvold et al., 1982).

Bunkan, a physiotherapist and psychologist, developed the ROBE in the early 60s (Bunkan, 2003). It was developed according to the clinical experience of NPMP, CAV and physiotherapy but also influenced by for example notions of flexion and extension patterns (Feldenkrais, 1990), the startle pattern (Bunkan, 2003) and the notions of the personality type A (B. Bunkan personal communication). Assessment with ROBE was undertaken to obtain information about patients referred to physiotherapy for various kinds of pain and tension in the musculo-skeletal system and also for patients referred for minor psychiatric

Figure 1. Norwegian tradition of psychosomatic body examinations
disorders. The main objective of the ROBE has been to get an overview of the patient’s symptoms, to define focus and treatment techniques, to follow changes in the patient’s body features and to predict prognosis. ROBE included weighted domain sum scores, referred to as the bodily resource score (Bunkan, 1996). In a cooperation between Meurle-Hallberg, Armelius and Bunkan (Meurle-Hallberg, 1991) ROBE was converted into a unipolarly scaled version, ROBE I, where items measuring assistance/resistance to passive movements were clustered to form a domain of psychological information. However, the psychometric properties and the applicability of ROBE I were never tested, but further developed by Bunkan et al into the Comprehensive Body Examination (CBE) in which items concerning assistance /resistance reactions to passive movements were recoded to belong to the domain Movement. Items concerning gait analysis, body experience/ awareness and the patient’s experience of the examination were added. For some of the items unipolar scaling was changed to become bipolar. CBE thus consists of both uni- and bipolar subscales (Bunkan, 2000).

The GPM and the CBE have been used in the publication of empirical studies, and have proved to differentiate statistically between patients with mental problems and healthy individuals. Sum scores of GPM were found to discriminate significantly between psychotic patients and neurotic patients (Sundsvold, 1975). In spite of the fact that the NPMP body examination aims at exploring psychosomatic states within the patient, GPM and CBE score the patient’s responses to passive movements in terms of assisting or resisting reactions as properties of physical movements rather than as an emotional, non-verbal body language expression of psychological attitudes. Thus, there are no markers to account for the differentiation between somatic and psychological manifestations in GPM and CBE.

Using a scale, whether unipolar or bipolar, allows for registration of one value per observation.

A bipolar scale assessing the shape of the spine, thus, only registers one value on a scale running from extension to flexion. The disadvantage is the multifocal observation, e.g., spinal flexion comes to contain kyphosis as well as lordosis. Converting bipolar scales to unipolar scales, on the other hand, allows for registration in separate scales e.g., for flexion in one scale and extension in a second scale. Consequently, unipolar scales ranging from normal to extreme flexion, will register kyphosis as well as its magnitude, in one scale and lordosis, in a second scale.

Unipolar scaling of the domains as in the ROBE I might simplify some of the complexity involved in tracking a psychomotor profile on the abundant field of sensory data that confront the physiotherapist while performing the examination. A computerized tool might provide longed-for supportive assistance to analyze those data. These considerations made us decide to return to and investigate the psychometric properties and the applicability of the ROBE I.

Relationships between physical and psychological characteristics
Although the number of studies investigating the relationship between physical and psychological characteristics is increasing, the number of published studies is still limited. Havik (Havik et al., 1991) analyzed the relationship between body-related data, background information, selection criteria for short-term psychotherapy and five dimensions of the Minnesota Multiphasic Personality Inventory (MMPI). The authors concluded that emotional conflicts and psychopathology were reflected in deviations in respiration, changes in posture and patterns of muscular tension. Furthermore, they found that older patients, patients with lower levels of education, higher degrees of chronic ailments or/and a high degree of personality deviations had more limited muscular and respiratory capabilities as assessed with the ROBE. These findings indicated that a more pronounced degree of psychopathology according to the MMPI was related to a lower muscle tone according to the ROBE. It was also found that patients with good muscular
and respiratory abilities were suitable for short-term psychotherapy (Mölstad et al., 1995). In another study, Kvåle used a new and shorter version of the GPE (GPE 78) to study 177 patients who were sick-listed due to long-lasting musculo-skeletal pain (Kvåle, Ellertsen, & Skouen, 2001). The study showed that patients with generalized pain had severe muscular problems and a pronounced susceptibility to somatic symptoms and perceived illnesses according to the MMPI-2. The relationship between other body assessment measures such as the BAS-Health (BAS-H) and instruments that measure self-assessed health was examined in two groups of patients (chronic pain and psychiatric disturbances), and in a comparison group of healthy individuals (Lundvik Gyllensten, 2001). The instruments employed included the General Psychological Wellbeing (GPW) scale, the Nottingham Health Profile (NHP), the Arthritis Self-Efficacy Scale (ASES), the Symptom Check List-90 (SCL-90), the Sense of Coherence (SOC) and the Sivic Psychosomatic test (SPS). Strong correlations were obtained between the BAS-H and all other tests except for the SPS, which is a personality test. The strongest correlations were obtained between the BAS-H and the NHP and ASES respectively. However, the authors reported that these strong correlations might have been affected by the investigator’s prior knowledge of the particular group to which the test subjects belonged.

The treatment of bodily symptoms has been found to have some effect on psychological problems. Monsen (Monsen & Monsen, 2000) conducted a controlled study of Psychodynamic Body Therapy (PBT) in 40 patients with localized musculo-skeletal pain. The intervention resulted in a clinical, statistically significant, positive change with respect to somatic symptoms, depression, anxiety, denial, self-assertion and conducive affect-awareness.

A controlled study (Grahn, Ekedahl, & Borgquist, 1998) of the rehabilitation effects of movement treatment according to the Body Awareness Therapy (BAT) was conducted with a group of 122 patients with musculo-skeletal complaints. A significant improvement in the variables which measured Health-Related Quality of Life (HRQOL), anxiety, movement-related pain, the physical and psychosocial effects of the work environment and the reduction in absences due to sick leave was observed in the intervention group in comparison with the control group.

In a study of movement treatment with BAT, conducted in a group of female patients at an open psychiatric ward, a decrease in the patients’ symptoms was observed according to the SCL-90, in addition to an improvement in self-image according to the SASB (Mattsson, Egberg, Armelius, & Mattsson, 1995). In a comparative study of the physical and mental health of patients with musculo-skeletal problems, conducted before and after the application of movement treatment methods, Malmgren-Olsson (Malmgren-Olsson & Armelius, 2001) found that self-image, measured with the SASB, had improved after treatment. Furthermore, improvements in mental health were observed over time according to the SCL-90. A negative self-image, according to the SASB, was found to give an indication of the outcome of the treatment.

OBJECTIVES

The main object of the two studies concerns the following questions:

1. Can the number of variables of the ROBE I be reduced while allowing the remaining variables to produce psychometrically sound subscales that also reflect the essence of the NPMP tradition?
2. If so, will this reduced new version, labeled ROBE II, treat the variation of items in the ten different subscales in such a way that it also provides discrimination between groups of patients with psychosomatic, musculoskeletal and schizophrenic disorders compared to a group of non-patients?
3. Are there associations between bodily resources assessed by a physiotherapist and self-assessed psychological factors in a group of patients with stress-related behavior and somatoform disorders? The research question was: how do patients with stress-related behavior and somatoform disorders assess symptoms and self-image when compared to groups of healthy individuals and how are these assessments related to bodily resources, assessed with the Resource-Oriented Body Examination (ROBE II)?

EMPIRICAL STUDIES

Study I: Body patterns in patients with psychosomatic, musculoskeletal and schizophrenic disorders: psychometric properties and clinical relevance of Resource Oriented Body Examination (ROBE-II)

Materials and Methods
The original data structure of the ROBE I was set to comprise 254 variables on a seven-point deviation rating scale, where 0 represented the ideal score and 6 the largest deviation from the normative ideal. Nineteen variables were not considered relevant. Six variables that measured hypermobility in shoulders and hips were considered superfluous. 13 variables relating to observations on skin and on the patients general conditions during the examination as well as the therapists’ individual global rating were considered to report subjective impressions rather than factual information and consequently were excluded from the data sheets. The final number of variables used for analysis was 235. The variables considered relevant were grouped together under five domains according to the NPMP theory: Posture, Respiration, Movement, Muscles and Reactions to Physical Touch.

Subjects
A total of 198 participants representing four groups, here labeled group I-IV, were body examined. Group I (n=22, female 15, male 7) was a control group consisting of people employed at two University Departments of Physiotherapy. None of the persons in the control group were on treatment for health problems at the time for the assessment. Patients in group II (n=81 female 62, male 19) were consecutive samples of patients who were referred to a Swedish specialist treatment unit in a psychiatric department for patients with substantial psychosomatic components in their illness/disease. Patients in group III (n=78, female 64, male 14) were selected from three different Swedish health care districts during 1997. None of the patients in the groups II and III had a specific organic disease as the sole referring diagnosis. Group IV (n=17, female 5, male 12) consisted of patients with a diagnosis of schizophrenia, all with a history of more than ten years of continuous hospitalisation in a psychiatric department.

All participants were informed of the purpose of the investigation and that their anonymity would be protected. It was underlined that participation was voluntary. The body examination lasted about one and a half hours. A specially designed test protocol was used. All data collectors had several years of experience and had received extensive pretraining using ROBE I. A test of the interrater reliability was made for ten persons in the control group.

Statistical Methods
Data from the body examination of all groups (n=198) for ROBE I (number of variables/individual = 235) were entered into a separate factor analysis for each of the five body domains. Principal Components with varimax rotation was used. The first two factors for each domain were extracted. The first factor was considered to be the principal measure of each domain. The factor loadings of the items derived were used as basis for the
subscales. The following criteria were applied in deciding to retain or disregard items: An item was removed if its factor loading was less than 0.50 for the body domains Posture, Respiration, Movement and Reaction to Physical Touch. For the Domain Muscles the items were numerous (n=100) and therefore factor loading was set to 0.60 for this group of variables.

Factor score was defined as the mean of the item scores. The internal consistency within the subscales was calculated using Cronbach’s Alpha. Finally, a one-way analysis of variance (ANOVA) was used to evaluate the capacity of the instrument to discriminate between the groups. P-values below 0.05 were considered statistically significant. The interrater reliability of ten cases for two judges was studied with intra class correlation (ICC), using absolute agreement definition and average measure intra class correlation. Software used was SPSS version 8.0 and 10.1 ("SPSS Base 8.0 for Windows users guide," 1998).

Results

Psychometric properties

The factor analysis provided ten subscales, two for each domain. The names of the subscales, a presentation of their contents and the numbers of items included are presented in Figure 2. ICC was satisfactory for all subscales (0.79 - 0.94), except for the subscales: Decreased respiratory movements, Increased respiratory control and Decreased hip movement (0.24, 0.21 and 0). The exclusion of two subjects, well known to one of the raters but not to the second, improved ICC from 0.24 to 0.55 for the subscale Decreased respiratory movements and from 0.21 to 0.49 for the subscale Increased respiratory control (Meurle-Hallberg, Armelius, & von Koch, 2004).

Intercorrelations of the subscales

The forced two factor analyzed subscales of ROBE II showed that the intercorrelation between the two subscales of each domain distinguished themselves satisfactorily (0.08-0.40) except for the subscales within the domain Movement, Decreased flexibility- neck and shoulder (subscale 5) and Decreased hip movement (subscale 6) which were not sufficiently separated (0.56).
### POSTURE

1. **Flexed postural pattern** (9 items)
   A flexed postural pattern where the ability to relax is decreased.

2. **Reclined postural pattern** (6 items)
   A reclined postural pattern where the weight is placed on the back of the feet, the legs have a backward positioning and the pelvis has a reduced inclination.

### RESPIRATION

3. **Decreased respiratory movements** (11 items)
   A breathing pattern where visibility and range of respiratory movements in the thorax and the abdomen is restricted and where the breathing doesn’t easily adapt while standing up/lying down or changing between positions.

4. **Increased respiratory control** (8 items)
   A breathing pattern related to the degree of stiffness of the ribcage and abdominal muscular control over expiration. The breathing doesn’t easily adapt while standing up/lying down or changing between positions.

### MOVEMENTS

5. **Decreased flexibility-neck and shoulder** (11 items)
   A pattern of rigidity and reduced range of movements coupled with lack of springiness in the neck, vertebral column, shoulders and arms.

6. **Decreased range of movements-hips** (4 items)
   A pattern of decrease in the range of movements during flexion and abduction of the hips.

### MUSCLES

7. **Slack muscular consistency** (37 items)
   A pattern of low muscular consistency with slack musculature covering the whole body.

8. **Hard muscular consistency** (30 items)
   A pattern of hard muscular consistency over the head, the neck, the chest, the shoulders and the lower back. The legs are not included in this scale.

### REACTIONS TOWARDS PHYSICAL TOUCH

9. **Assistance reactions to physical touch** (16 items)
   A patterned control over physical touch distinguished by the patient’s ambitions to keep the lead over tempo, resulting in over assistance to the passive movements induced by the therapist.

10. **Resistance reactions against physical touch** (12 items)
    A patterned control over physical touch distinguished by the patient’s resistance to the passive movements induced by the therapist, thus lowering tempo or bringing the movement communication to an end.

*Figure 2. ROBE II. Name of domains, subscales and variable numbers.*
Differences between groups

ROBE II allowed for discrimination between groups of patients with psychosomatic, musculoskeletal and schizophrenic disorders compared with a group of non-patients. The mean scores and 95% Confidence Intervals by subscale for Groups I-IV are illustrated in Figure 3.

**Figure 3.** The means scores and 95% confidence intervals by subscale for groups I-IV.
The schizophrenic patients, group IV(S), clearly deviated most from the norms in all subscales. The patients with musculoskeletal disorders, group III(MS), scored high on the subscale *Hard muscular consistency* and *Decreased respiratory movements*.

The means score for the subscales of ROBE II is illustrated in Fig. 4 below:

![Figure 4. Mean score for subscales of ROBE II for groups I-IV. C = Group I, PS = Group II, MS = Group III, S = Group IV.](image)

Discussion
The investigation of ROBE I showed that its psychometric properties justified construction of a compressed version, labeled ROBE II. This instrument consists of subscales representing ten body patterns, which are clearly in agreement with the clinical tradition of the field. The clinician’s impressions of disturbances observed in Posture, Respiration, Movement, Muscles, and Reactions to Physical Touch, previously subjectively evaluated can now be clearly profiled by the scores of the ten subscales of ROBE II. The procedure is further facilitated by the fact that the observations can be now be registered in a computer program that provides the patient’s individual profile, which might facilitate treatment planning and apprehension of changes during treatment.

Two of the subscales, delineated from the domain Reactions to physical touch, provided the instrument of ROBE II with psychological markers to differentiate between somatic and psychological symptom manifestations. The first subscale of ROBE II for this domain *Assistance Reactions to Physical Touch* was able to separate groups of patients with psychosomatic and musculoskeletal symptoms from patients with schizophrenic disorders as well as from the controls, and the second *Resistance Reactions to Physical Touch* separated the psychosomatic patients from the musculoskeletal patients and the schizophrenic patients as well as from the controls.

Posture
The scores of ROBE II for all groups in this study on the subscale Flexed postural pattern and on Reclined postural pattern confirmed descriptions made by Reich (Reich, 1972),
Feldenkrais (Feldenkrais, 1990), and Bunkan (Bunkan, 1996) on how deviations in posture can relate to deviations in well being. The body pattern of reclination was not detected by the bipolarly scaled CBE (Bunkan, 1998). Clinically, this pattern has been regarded as a postural state in which a generally withdrawn emotional attitude might be embodied (Keleman, 1986). This postural pattern was found to be common among the schizophrenic patients in our sample but not in the other groups.

**Respiration**

The construct of the body domain of Respiration is considered the prime domain in the NPMP (Övreberg & Andersen, 1989). Using ROBE II it was possible to single out consistent items that formed subscales representing two body patterns of blocked respiration: *Decreased respiratory movements* and *Increased respiratory control*. The patients with musculoskeletal problems scored higher (3.53) for *Decreased respiratory movements* than for *Increased respiratory control* (1.80). The psychosomatic patients, on the other hand, showed slightly more *Increased respiratory control* than *Decreased respiratory movements* - a finding that is in line with both Reich’s and Braatöy’s theories that controlled abdominal breathing in supine position gives an indication of the patient’s degree of anxiety (Braatöy, 1947; Reich, 1972). The schizophrenic patients showed significant differences from the rest of the groups for their simultaneous high scoring on both scales of the domain thus revealing a deep lack of resources for spontaneous breathing. The items of the subscale *Decreased respiratory movements* on ROBE II were close to the items emerging in Kvåle’s analysis of the domain of Respiration in GPM (Kvåle, Backer Johnsen, & Ljunggren, 2002). The inter rater reliability of PT I and PT II was low in this study for the two subscales in the domain of Respiration. This might be caused by the fact that two of the subjects were unknown to PT I, but were colleagues and well known to PT II, which might have had influenced respiration. From clinical experience it is well known that respiration is easily biased by the context. (B. Bunkan personal communication). The exclusion of the two subjects from the inter rater analysis improved ICC.

**Movements**

The first subscale, *Decreased flexibility- neck and shoulder*, clearly separated the control group and the schizophrenic patients from one another and from the other two groups. They, on the other hand, clustered closely together in this scale, which seems to contain a body pattern of central importance for psychosomatically oriented symptoms and muscle tension.

The subscale, *Decreased flexibility- neck and shoulder*, was poorly separated from the second subscale, *Decreased hip movement*. The subscale, *Decreased hip movement*, showed lack of variation and poor psychometric capacity and poor inter rater reliability. Further research attention is needed in order to develop this subscale.

**Muscles**

In our study two groups distinguished themselves on the subscale, *Slack muscular consistency*: one was Group I, the control group, and the other was Group IV, the schizophrenic patients. Our findings are in accordance with Johnsen’s theory of MRD (Johnsen, 1981) claiming that a moderate degree of hypotension balanced with an equally moderate degree of tension is a sign of a well functioning human being as scored in group I (1.08 for *Slack* and 0.80 for *Hard muscular consistency*). Johnsen also postulates that when muscle groups show coexistence of considerably stiff as well as of considerably slack muscular consistency in response to palpation, this indicates a conflict in the patient between mental states of feeling exhausted and shut off at the same time (Johnsen, 1968). This muscular imbalance was apparent in group IV (the mean score for the group was 2.86
for Slack and 3.11 for Hard muscular consistency). The participants with musculoskeletal problems did not show this imbalance. Their rating for Hard muscular consistency was as high as for the schizophrenics but they did not score for Slack muscular consistency (3.12 for Hard versus 0.38 for Slack muscular consistency). The participants with psychosomatic disorders followed the same pattern as those with musculoskeletal problems (2.00 for Hard versus 0.27 for Slack muscular consistency).

ROBE II disclosed that the legs were not included in the body pattern of hard muscles. This finding corresponds with the NPMP tradition, where the prevalence of slack leg muscles in an otherwise tense body is regarded as a substantial sign of an unbalanced psychosomatic state. None of these patterns, well known to clinicians in the field, revealed themselves in CBE, where subscales on hard and slack muscles were clustered under a peripheral or central location (Bunkan, Ljunggren, Opjordsmoen, Moen, & Friis, 2001).

Reactions to physical touch
We found that the two subscales derived from the domain Reactions to physical touch constructed a psychologically meaningful dimension. The scales did not overlap but were complementary. The first subscale, Assistance reaction to physical touch was correlated with Hard muscular consistency (0.58) and Increased respiratory control (0.52). It might contain information that represents a state of controlled muscular and respiratory tension where emotional expression, in line with the thinking of Reich and Braatoy, can be maintained by habitual regulation through anticipatory movements. Assistance reactions have been interpreted by NPMP tradition as a state of mind where one is “eager to please” rather than in possession of an autonomous self as a base for action (Thornqvist & Bunkan, 1991).

The subscale Resistance reactions to physical touch was correlated to Decreased flexibility-neck and shoulder (0.74), Decreased hip movements (0.61), Flexed postural pattern (0.57) and to Hard muscular consistency (0.52), which indicates that the scale contains information on a tight, strained and rigid bodily attitude. High scoring on this scale profiles a “stiff necked” person, handling the situation by offering protest and resistance to cooperation. In the NPMP tradition both behaviors in this domain are regarded as conflict-prone and related to emotional disturbances (Lerang Svendsen, 1975) alerting the therapist to employ careful attention in order not to intrude upon the patient. The patient’s bodily reaction to the therapist’s nonverbal interventions needs to be further investigated and has so far been described mainly in psychoanalytic descriptions of phenomena of transference-counter transference (Holmqvist, 1996).

Study II: Associations between physical and psychological problems in a group of patients with stress-related behaviour and somatoform disorders.

Patients and Methods
Fifty consecutive patients who were referred to a treatment center specializing in psychosomatic problems between September 1991 and July 1992 were deemed suitable for the study. The patients were assessed using the ROBE II during the first consultation. Thirteen patients were found to have insufficient physical resources for the movement therapy. The remaining 37 patients were informed of the study in writing. They were further informed that their participation in the study would not affect future treatment, that they were guaranteed the option to withdraw from the study throughout its entire duration and that all submitted information would be treated confidentially. The patients were included after signing a document of informed consent. Six patients chose to leave the study after inclusion. Thirty-one patients participated in the study. The patients filled out
the questionnaires for SASB and SCL-90 at the first visit for treatment with movement therapy.

Subjects
The participants consisted of almost twice as many women (n=20) as there were men (n=11). Most of the participants were either married or cohabiting. At the time for the study, all of them were in vocational rehabilitation, on sick leave or on disability pension, none of them were working. All the participants, except one, were of Swedish origin.

Diagnoses
Most of the referrals for movement therapy at the treatment center for psychosomatic problems come from doctors but also other health care professionals refer patients. Diagnoses are seldom stated on the referral form, and patients are recommended body awareness training and relaxation techniques for a variety of symptoms (Meurle-Hallberg, 1993). The patients who choose to participate in this project were offered a diagnostic assessment according to the Diagnostic and Statistical Manual of Mental Disorders III (DSM III) and the International Classification of Diseases-9 (APA, 1980) with a specialist in psychiatry and internal medicine. The diagnosis that resulted in referral for treatment with movement therapy was regarded as the main diagnosis, while other health problems were coded as “additional”.

Twenty-eight of the patients undertook the diagnostic interview. The diagnoses of the 28 patients are shown in Table 1.

Table 1
Psychiatric diagnoses according to the DSM III-R and ICD system (n=28)

<table>
<thead>
<tr>
<th>Main Diagnosis</th>
<th>n=28</th>
<th>Additional diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somatoform pain disorder (DSMIII-R 307.80)</td>
<td>10</td>
<td>Earlier alcohol dependence (DSMIII-R 303.90)</td>
</tr>
<tr>
<td>Somatoform pain disorder (DSMIII-R 307.80)</td>
<td>1</td>
<td>Psychoactive substance dependence, analgesics (DSMIII-R 307.80)</td>
</tr>
<tr>
<td>Somatoform pain disorder (DSMIII-R 307.80)</td>
<td>1</td>
<td>Agoraphobia, Social phobia, compulsive disorder (DSMIII-R 300.22 + DSMIII-R 300.23 + DSMIII-R 330.30)</td>
</tr>
<tr>
<td>Somatoform pain disorder (DSMIII-R 307.80)</td>
<td>1</td>
<td>Schizophreniform disorder (DSMIII-R 295.90)</td>
</tr>
<tr>
<td>Somatoform pain disorder (DSMIII-R 307.80)</td>
<td>1</td>
<td>Bipolar disorder, mixed, unspecified (DSMIII-R 296.60)</td>
</tr>
<tr>
<td>Undifferentiated somatoform disorder (DSMIII-R 300.70)</td>
<td>2</td>
<td>Special symptoms or syndromes not elsewhere classified</td>
</tr>
<tr>
<td>ICD-9 number 307</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Unspecified mental disorder - nonpsychotic (DSMIII-R 300.90)</td>
<td>1</td>
<td>Major depression, recurrent (DSMIII-R 296.30),</td>
</tr>
<tr>
<td>Generalized anxiety disorder (DSMIII-R 300.02)</td>
<td>1</td>
<td>Earlier alcohol dependence, poly substance dependence (DSMIII-R 303.90 and 304.90)</td>
</tr>
<tr>
<td>Panic disorder, with agoraphobia (DSMIII-R 300.21)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Earlier panic disorder, with agoraphobia (DSMIII-R 300.21)</td>
<td>1</td>
<td>Major depression, recurrent, unspecified (DSMIII-R 296.30)</td>
</tr>
<tr>
<td>Primary insomnia</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DSMIII-R nr 307.42</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Migraine (ICD-9 number 346W)</td>
<td>1</td>
<td>Earlier alcohol dependence and amphetamine dependence (DSMIII-R 303.90 and 304.0)</td>
</tr>
<tr>
<td>Stuttering (DSMIII-R 307.00)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Idiopathic protocolitis (ICD-9 number 556)</td>
<td>1</td>
<td>Major depression, single episode, in full remission (DSMIII-R 296.26)</td>
</tr>
<tr>
<td>Degeneration of cerv. intervert. disc (ICD-9 number 722.4)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Curvature of spine (ICD-9 number 737)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The referral diagnoses of the three patients who rejected to be diagnosed by the center doctor were: irritable colon, a combined suffering from stuttering and alcoholism, and cancer.

Eleven patients had previously been in psychiatric care. Ten patients used psychopharmacological drugs on a daily basis.
Comparison groups
The comparison group (n=22, female 15, male 7) for the ROBE II was composed of staff members and students from two physiotherapy training programs (Meurle-Hallberg et al., 2004). The comparison group for SASB (n=52, female 28, male 24) and SCL-90 (n=51, female 17, male 28) consisted of individuals who either were workers or students. For the SCL-group six of the students did not fill out information for gender. None of the individuals in the comparison groups was a psychiatric patient at the time of the study (Armelius, 2001).

Instruments
Resource-Oriented Body Examination
ROBE II as described in study I.

The Symptom Checklist-90 (SCL-90)
The SCL-90 (Derogatis, Lipman, & Covi, 1973) and The Symptom Checklist-90-Revised (SCL-90 R) were developed by Derogatis (Derogatis, 1994) to assess a broad range of psychological problems and symptoms of psychopathology. The SCL-90 and SCL-90 R, an upgraded version of SCL-90, are used by clinical psychologists, psychiatrists, and counseling professionals in mental health, medical, and educational settings as well as for research purposes. SCL-90 consists of 90 questions on various aspects of psychiatric symptomatology, 83 of which have been grouped into nine subscales: Somatization (12 items), Obsessive-Compulsive (10 items), Interpersonal Sensitivity (9 items), Depression (13 items), Anxiety (10 items), Anger-Hostility (6 items), Phobic Anxiety (7 items), Paranoid Ideation (6 items) and Psychoticism (10 items). The Additional Scale with seven additional items includes information about disturbances in appetite and sleep. A global distress index, Global Severity Index (GSI), can be calculated from the individual’s ratings on all the 90 items. Participants rate the extent to which they experience that they have had each ailment on a rating scale from 0 (“not at all”) to 4 (“very much”).

Personality Severity Index (PSI)
Karterud et al (Karterud, Friis, Irion, Mehlum, & et al., 1995) created The PSI based on the SCL-90-R subscales of Interpersonal Sensitivity, which measures the vulnerability of the self, Anger-Hostility, which measures narcissistic rage, and Paranoid Ideation, which measures projective identification. The PSI has been tested on patients with personality disorders and based on the findings from that study, Karterud and coworkers suggested that the PSI reflects personality traits rather than subjective states that fluctuate with alterations in anxiety and affects, as well as in social conflicts and support.

Structural Analysis of Social Behavior (SASB)
Self-assessments of self-image on the SASB provides information on two basic dimensions: affiliation, with the extremes self-hate/ self-love, and interdependence, with the extremes self-control/spontaneity (Armelius, 2001; Benjamin, 1974; Öhman & Armelius, 1993). The SASB self-image measure consists of 36 questions. Patients grade how they experience each item in the questionnaire on a rating scale that ranges from 0 (“not at all”) to 100 (“perfectly”). The 36 questions are combined into 8 clusters, Spontaneous self, Self-acceptance/exploration, Self-love/cherishing, Self-nourishment/enhancement, Self-monitoring/restraint, Self-indictment/oppression, Self-rejection/destruction, Daydreaming/ self-neglect, which combine affiliation and interdependence in complementary degrees (Hartley, 1991). The SASB self-image model is shown in Figure 5.
Figure 5. The eight SASB clusters for self-image

The SASB thus shows whether the individual’s self-reported self-image is positive (= high scores on the clusters that measure self-love, i.e., clusters 2, 3 and 4), or negative (= high scores on the clusters that measure self-hatred (i.e., clusters 6, 7 and 8), and it also shows to what extent the individual perceives that his or her self-image is characterized by self-control (cluster 5) and spontaneity (cluster 1) respectively. The self-image in normal individuals is characterized by active self-affirmation, self-love, self-protection and an adaptive capacity for flexibility when the situation so demands (Benjamin, 1993). Factor analysis gave support for the construct validity of SASB (Benjamin, 1974). Naive judges, who rated each item for the proposed dimensions of affiliation, supported the content validity of SASB (Benjamin, 1987). The clinical soundness and relevance of the SASB model has been confirmed by its use in various research and clinical settings (Benjamin, 1974). Armelius, Lindelöf and Mårtensson developed a Swedish version of SASB (Armelius, Lindelöf, & Mårtensson, 1983) and support for the validity of the Swedish version of the SASB has been reported (Armelius & Öhman, 1990). With the Swedish version of SASB, it has been shown that it is possible to distinguish between psychiatric patients with different DSM-III diagnoses in terms of image of self, mother and father (Armelius, 1994; Armelius & Öhman, 1990).

Statistical Analysis
The patient group and the comparison groups were analyzed using T-test for independent groups. Correlations between the patient group and the comparison groups were calculated using Pearson’s product moment correlations (r). Alpha was set at 0.05.

Results
Comparisons of bodily resources, symptoms, and self-image in the patients and comparison groups
There were significant differences ($p \leq 0.01$) on all ROBE II subscales between the patient and comparison group except for subscale 3 (Decreased respiratory movement) and subscale 9 (Assistance reactions to physical touch). The patient group had significantly higher scores on all the SCL-90 subscales ($p \leq 0.01$). On the SASB there were statistically significant differences between the patient and comparison group on all the subscales ($p \leq 0.01$) except for Spontaneous self (cluster 1), Self-monitoring and restraint (cluster 5), and Self-indictment and oppression (cluster 6). The mean values on ROBE II, SCL90 and SASB for the patient group and the comparison groups are shown in Table 2:
Table 2
Mean, SD and p-value for ROBE II, SCL-90, SASB for the patient group and the comparison groups

<table>
<thead>
<tr>
<th>ROBE II</th>
<th>Patient-group</th>
<th>Comparison-group</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Flexed Postural Pattern</td>
<td>1.60</td>
<td>1.04</td>
<td>0.74</td>
<td>0.72</td>
<td>0.01</td>
</tr>
<tr>
<td>2. Reclined Postural Pattern</td>
<td>2.16</td>
<td>1.72</td>
<td>0.82</td>
<td>0.33</td>
<td>0.01</td>
</tr>
<tr>
<td>3. Decreased Respiratory Movements</td>
<td>1.76</td>
<td>1.82</td>
<td>1.11</td>
<td>1.20</td>
<td>0.86</td>
</tr>
<tr>
<td>4. Increased Respiratory Control</td>
<td>1.78</td>
<td>0.73</td>
<td>0.98</td>
<td>0.42</td>
<td>0.00</td>
</tr>
<tr>
<td>5. Decreased Neck and Shoulder Movements</td>
<td>2.08</td>
<td>1.05</td>
<td>0.83</td>
<td>0.51</td>
<td>0.00</td>
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<tr>
<td>6. Decreased Hip Movements</td>
<td>0.99</td>
<td>0.11</td>
<td>1.01</td>
<td>0.26</td>
<td>0.00</td>
</tr>
<tr>
<td>7. Slack Muscular Consistency</td>
<td>0.16</td>
<td>0.97</td>
<td>0.39</td>
<td>0.81</td>
<td>0.00</td>
</tr>
<tr>
<td>8. Hard Muscular Consistency</td>
<td>1.61</td>
<td>0.85</td>
<td>0.64</td>
<td>0.71</td>
<td>0.00</td>
</tr>
<tr>
<td>9. Assistance Reactions to Physical Touch</td>
<td>0.48</td>
<td>0.43</td>
<td>0.65</td>
<td>0.31</td>
<td>0.71</td>
</tr>
<tr>
<td>10. Resistance Reactions to Physical Touch</td>
<td>1.16</td>
<td>0.54</td>
<td>0.96</td>
<td>0.40</td>
<td>0.00</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>SCL 90</th>
<th></th>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>1. Somatization</td>
<td>1.62</td>
<td>0.47</td>
<td>0.63</td>
<td>0.51</td>
<td>0.00</td>
</tr>
<tr>
<td>2. Obsessive-Compulsive</td>
<td>1.50</td>
<td>0.76</td>
<td>0.81</td>
<td>0.58</td>
<td>0.00</td>
</tr>
<tr>
<td>3. Interpersonal Sensitivity</td>
<td>1.11</td>
<td>0.58</td>
<td>0.78</td>
<td>0.50</td>
<td>0.00</td>
</tr>
<tr>
<td>4. Depression</td>
<td>1.44</td>
<td>0.74</td>
<td>0.98</td>
<td>0.72</td>
<td>0.00</td>
</tr>
<tr>
<td>5. Anxiety</td>
<td>1.22</td>
<td>0.56</td>
<td>0.82</td>
<td>0.59</td>
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<td>6. Anger-Hostility</td>
<td>0.75</td>
<td>0.44</td>
<td>0.68</td>
<td>0.43</td>
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<td>7. Phobic anxiety</td>
<td>0.95</td>
<td>0.18</td>
<td>0.96</td>
<td>0.24</td>
<td>0.00</td>
</tr>
<tr>
<td>8. Paranoid Ideation</td>
<td>0.86</td>
<td>0.40</td>
<td>0.70</td>
<td>0.51</td>
<td>0.00</td>
</tr>
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<td>9. Psychoticism</td>
<td>0.55</td>
<td>0.24</td>
<td>0.53</td>
<td>0.35</td>
<td>0.01</td>
</tr>
<tr>
<td>10. Additional Scale</td>
<td>1.49</td>
<td>0.61</td>
<td>0.79</td>
<td>0.45</td>
<td>0.00</td>
</tr>
<tr>
<td>11. The Personality Severity Index(PSI)</td>
<td>1.12</td>
<td>0.48</td>
<td>0.63</td>
<td>0.39</td>
<td>0.00</td>
</tr>
<tr>
<td>12. Additional Global Severity Index (GSI)</td>
<td>1.27</td>
<td>0.51</td>
<td>0.72</td>
<td>0.40</td>
<td>0.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SASB</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Spontaneous self</td>
<td>33.97</td>
<td>40.92</td>
<td>18.81</td>
<td>12.12</td>
<td>0.07</td>
</tr>
<tr>
<td>2. Self-acceptance and exploration</td>
<td>47.94</td>
<td>61.29</td>
<td>24.16</td>
<td>18.11</td>
<td>0.01</td>
</tr>
<tr>
<td>3. Self-love and cherishing</td>
<td>44.55</td>
<td>58.37</td>
<td>23.71</td>
<td>16.82</td>
<td>0.01</td>
</tr>
<tr>
<td>4. Self-nourishment and enhancement</td>
<td>45.58</td>
<td>58.23</td>
<td>19.27</td>
<td>13.17</td>
<td>0.00</td>
</tr>
<tr>
<td>5. Self-monitoring and restraint</td>
<td>48.81</td>
<td>51.85</td>
<td>20.94</td>
<td>17.42</td>
<td>0.50</td>
</tr>
<tr>
<td>6. Self-indictment and oppression</td>
<td>33.39</td>
<td>25.79</td>
<td>25.47</td>
<td>20.52</td>
<td>0.16</td>
</tr>
<tr>
<td>7. Self-rejection and destruction</td>
<td>30.29</td>
<td>16.19</td>
<td>20.40</td>
<td>14.69</td>
<td>0.00</td>
</tr>
<tr>
<td>8. Daydreaming and self-neglect</td>
<td>28.94</td>
<td>19.04</td>
<td>15.67</td>
<td>10.84</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Associations between the patients' bodily resources, symptoms, and self-image
The correlations between the physiotherapeutic assessments of bodily capacities according to assessed scores of the ROBE II, the self-assessed mental health symptoms according to the SCL-90 and self-image according to the SASB for the patient group are shown in Table 3.
Table 3

Significant correlations between test results on subscales of ROBE II, SCL 90 and SASB for the patient group (n=31)

<table>
<thead>
<tr>
<th></th>
<th>ROBE II</th>
<th></th>
<th>SCL 90</th>
<th>SASB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subscale 1</td>
<td>Subscale 2</td>
<td>Subscale 3</td>
<td>Subscale 4</td>
</tr>
<tr>
<td></td>
<td>Flexed postural pattern</td>
<td>Reclined postural pattern</td>
<td>Decreased respiratory movements</td>
<td>Increased respiratory control</td>
</tr>
<tr>
<td>Depression</td>
<td>0.37 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger-Hostility</td>
<td>0.37 *</td>
<td></td>
<td>0.45**</td>
<td>0.47**</td>
</tr>
<tr>
<td>Phobic Anxiety</td>
<td></td>
<td>0.50**</td>
<td></td>
<td>0.50**</td>
</tr>
<tr>
<td>Paranoid Ideation</td>
<td></td>
<td>0.36*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychotism</td>
<td>0.40 *</td>
<td></td>
<td></td>
<td>0.40*</td>
</tr>
<tr>
<td>Somatization</td>
<td></td>
<td>-0.41*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personality Severity Index</td>
<td></td>
<td></td>
<td></td>
<td>0.40*</td>
</tr>
<tr>
<td>SASB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-indictment and oppression (cluster 6)</td>
<td>0.38 *</td>
<td>0.38 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-rejection and destruction (cluster 7)</td>
<td></td>
<td>0.37 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daydreaming and self-neglect (cluster 8)</td>
<td></td>
<td>0.45 *</td>
<td>0.42 *</td>
<td>0.38 *</td>
</tr>
</tbody>
</table>

Pearson (r)* = p<0.05. **= ≤ 0.01

Table 3 shows that the majority of significant correlations concerned a body pattern of Increased respiratory control (subscale 4), Flexed postural pattern (subscale 1) and Decreased flexibility neck and shoulders (subscale 5). High scores on these ROBE II subscales, correlated with high scores for Anger-Hostility (SCL-subscale 6) and for Phobic anxiety (SCL-subscale 7), as well as with high scores for Daydreaming and self-neglect (SASB cluster 8), and Self-indictment and self-oppression (SASB cluster 6).

There was a negative correlation between ROBE II Reclined postural pattern (subscale 2), and SCL-90 Somatization (subscale 1) (r=-0.40, p < 0.05). The index for personality disorders, PSI, derived from the SCL - 90-R subscales Interpersonal Sensitivity (subscale 3), Anger Hostility (subscale 6) and Paranoid Ideation (subscale 8) correlated significantly with the level of Increased respiratory control (r=0. 40, p < 0.05). In parallel, patients with high scores on cluster 6 (Self-indictment and Self-oppression) tended to have a higher degree of Increased respiratory control and of Hard muscular consistency.

**GENERAL DISCUSSION**

Results from this study indicate that when patients, inflicted by stress-related behavior and somatoform disorders, are compared with healthy individuals, their bodily assessment (ROBE II) accounts for a larger amount of physical impairment. When self-assessed, the patient’s symptoms of mental health (SCL-90) are rated as more serious and a more negative self image (SASB) is reported.
The assessment with ROBE II subscales *Increased respiratory control, Flexed postural pattern* and *Decreased flexibility neck and shoulders* provided signs of bodily impairment that showed close association with Anger-Hostility (SCL-90) and Daydreaming and self-neglect (SASB). It is also noteworthy that, among the ROBE II subscales, only *Increased respiratory control* had a significant correlation with the PSI which purportedly is an indicator of personality disorder.

**Psychological problems and general rather than specific physical signs**

The results of this study showed that the group of patients with stress-related behavior and somatoform disorders had significantly more problems and insufficiencies in physical resources compared to a comparison group with healthy individuals. The bodily signs of impairment, measured with the ROBE II, which differentiated the patient group from the non-patients in the comparison group, concerned the majority of the ROBE II subscales, which suggests that the patients had a general rather than a specific decrease in their bodily resources in all the domains that are measured with the ROBE II. Our findings support Bunkan (Bunkan, 1996) who argues that the imbalances in body functioning within but also between the domains of Posture, Respiration, Movement, and Muscles may be weighted on a continuum along a dimension characterized by bodily impairment. Also, the ROBE II ratings are not very high- for all of the subscales the mean is well below scale-point 3, which is the mid score of the scale. This is in line with the means of the CBE subscales for a group of Pain Syndrome patients that were examined by Bunkan (Friis, Bunkan, Opjordsmoen, Moen, & Ljunggren, 2002) and the group of chronic patients in Monsen’s study (Monsen, 2002). By correlating the GPE-78 with the MMPI, Kvåle (Kvåle et al., 2001) found that patients with widespread pain had significantly more physical and psychological aberrations than patients with more localized pain. The patients in this study had a mean score on the SCL-90 subscale of GSI (which measures the general prevalence of psychological problems) of 1.27 while the comparison- group scored 0.51 and in Monsen’s sample of patients with chronic pain the mean GSI was 0.83 (Monsen, 2002). Thus, it is possible that individuals in our sample suffer from a considerable amount of psychological problems.

**Character armoring and respiration**

According to Bunkan respiration is the most important domain in the NPMP tradition, examined in both upright and supine position (Bunkan, Opjordsmoen, Moen, Ljunggren, & Friis, 1999). In a similar vein, Monsen (Monsen, 2002) in her thesis “A study of patients with pain disorder” described the respiratory pattern, which, although it is viewed to function in interaction with the domains of posture, movements and muscles, often is regarded as the body’s strongest expression of affects. This is in line with one of the key-concepts of Reich, ‘Character-Armour’, which defines a bodily state where emotions are controlled by willpower instead of acted upon, and thus repressed back into the body, which then loses its spontaneous adaptability and liveliness. The results of the present study show that Increased respiratory control appears in association with Anger Hostility, Phobic Anxiety, Paranoid Ideation, Self-indictment and oppression and Day-dreaming and self-neglect, all of which are related to states of mind well described by Reich in his Character Analysis, a generally accepted basic reading in most forms of body-therapies (Reich, 1972). The SASB cluster 6, Self-indictment and oppression correlated with Increased respiratory control and Hard muscular consistency, both fundamental signs of the bodily impairment referred to by Reich (Reich, 1972) as Muscular Armoring, which, in his opinion, was the physical expression of Character Armour.

The functions of Respiration are, among a wealth of other interconnections, closely related to those of the lumbar part of the spine and the thorax.
Depression and flexed postural pattern

According to Bunkan, clinical experience from NPMP indicates that spinal flexion is a prominent sign in many depressed patients. However, in her study “What are the Basic Domains of Body Posture?” she was unable to confirm this assumption (Friis et al., 1998). In the present study, the SCL-90 subscale of Depression was significantly associated with only one of the ROBE II subscales, Flexed postural pattern. In addition to Increased respiratory control, the bodily sign of Flexed postural pattern was the subscale that correlated most frequently with self assessed mental symptoms and self-image.

Assessing Somatization

When the patients in our sample assessed their symptoms, the SCL-90 subscale of Somatization was the most protruding. Also, the average score on the subscale Somatization for the patient group (mean = 1.62) was significantly higher compared to the average score for the non-patient group (mean = 0.47) (table 2). At the same time, the subscale of Somatization correlated significantly with only one of the ROBE II subscales (table 2), Reclined Postural pattern and this correlation was negative. This negative correlation may just be a spurious relationship, i.e. both Somatization and Reclined Postural pattern are driven by a third variable. However, considering that the subscales of ROBE are built on a unipolar scaling and that a forced two-factor solution was used, this result may also reflect the orthogonality of the measure’s design. Since flexion and reclination are opposite postural patterns, a negative relationship between reclination and somatization, and a corresponding positive relationship between Flexed postural pattern and Somatization would be expected. Such a correlation was not obtained in this study. However further research on this issue should be undertaken.

In future research, observer ratings could be supplemented with self-assessments. In a review of strategies and instruments that are used to assess somatoform disorders, Hiller and Janca (Hiller & Janca, 2003) put forward the difference in magnitude between self-assessed symptoms and observations made by the doctors, and the authors argued that this disorder cannot be observed but only subjectively perceived.

In the paper “Rethinking somatization” McWhinney (McWhinney, Epstein, & Freeman, 2001) argued that the frustration and difficulty experienced by physicians who set the diagnosis of somatoform disorder is due to the unsatisfactory status of the concept of somatization, and the assumptions on which it is based. In McWhinney’s opinion the concept of somatization perpetuates the prevailing dualistic distinction between mental and physical illness in the sense that attention is given to emotions only in certain kinds of illness, when diagnosis after testing is found to be unclear. Our study suggested that although the patient’s self assessments mirrored severe problems with Somatization, however, as measured with ROBE II, with one exception, Somatization was not strongly related to bodily impairment. This finding may well be due to chance.

An alternative explanation is that similar to the physicians the physiotherapist who assesses bodily resources with ROBE II does not find observable bodily signs of phenomena constituting the 12 items of the Somatization subscale of SCL, e.g., Headaches, Faintness or dizziness, Pains in heart or chest, Pains in lower back, Nausea or upset stomach, Soreness of muscles, Trouble getting your breath, Hot or cold spells, Numbness or tingling in part of the body, Lump in your throat, Feeling weak in parts of your body, Heavy feeling in your arms or legs. These states describe highly complex processes of symptom formation, which are not easily detected by a bodily examination. However, the mental symptoms and the negative self-image (Anger/Hostility, Self-indictment and Oppression) in these patients might reflect emotions that are associated with the bodily impairments, that are measured with ROBE II (i.e., Increased Respiratory Control (subscale 4), Decreased respiration, Flexed posture (subscale 1) and Decreased flexibility neck and shoulder (subscale 5). The latter
interpretation of our data implies that the physical impairments that were found in this patient group using ROBE II might belong to a different entity from what is traditionally referred to with the term “Somatization”. While handling the body of a patient with somatoform disorder it is likely that the physiotherapist at the same time works with the patient’s emotions, that it is with “the lived body”, (Bullington, 1999; Rosberg, 2000; Thornqvist & Bunkan, 1991).

It is reasonable to assume that some of the positive effects that patients obtain from body treatment are linked to the manner in which they experience their symptoms, and also to their perception of the physiotherapists’ behaviours towards them (Malmgren-Olsson, 2002).

Bodily correspondence of anger, hostility and negative self-image
The strong correlations between the SCL-90 subscale Anger-Hostility and the ROBE II subscales that measure respiration, posture and movement corresponds with theories that emphasize the importance of managing the negative conditions of aggression in somatic disorders (Downing, 1997; Monsen, 2002; Vlaeyen & Linton, 2000). Others have reported that neuroticism is related to the experience of somatic disorders, and that neuroticism and negative self-image partly reflect the same aspect of the personality (Pincus & Wiggins, 1990). It is well established that a negative self-image is associated with a range of other problems such as bulimia, anorexia (Bjorck, Clinton, Sohlberg, Hallstrom, & Norring, 2003) and various other psychological disorders (Armelius & Granberg, 2000; Edenius & Falk, 2002; Ruiz, Pincus, & Bedics, 1999; Öhman & Armelius, 1990) but there is no previous study that shows that negative self-image is linked to impaired bodily capacity as has now been demonstrated with the ROBE II subscales. For example, Lundvik Gyllensten (Lundvik Gyllensten, Ekdahl, & Hansson, 1999) found no association between personality measured with the Sivic Psychosomatic test and bodily resources measured according to the BAS-H. However, in the present study, when personality was defined as self-image, and measured with the SASB, significant correlations with bodily capacities measured with the ROBE II subscales was found. It is reasonable to assume that the definition of personality and bodily capacity respectively, as well as the selection of assessment tools, influence the results of the statistical analyses using Pearson’s product moment correlations. The bodily capacities that appeared to have the strongest correlation with the patients’ views of themselves were: Increased respiratory control, Flexed postural pattern, Decreased flexibility in neck and shoulder. The poorer these bodily capacities were deemed to function, the more symptoms the patient experienced and the more negatively he treated himself.

Limitations of the study.
A weakness of this study was that it is based on a small, selected group of patients with somatoform disorders and stress-related behavior who were referred for treatment with movement therapy. Therefore, the generalizability of the study results may be limited. However, a number of the impairments in bodily capacities that were found to associate with mental symptoms and self-image, i.e. Increased respiratory control, Flexed postural pattern, and Decreased flexibility of neck and shoulder, tended to recur in a concurrent pattern. Moreover, these findings are in line with clinical observations as well as with current theories in the field. It may therefore be safe to suggest that these findings are not only random discoveries but that they may reflect stable correlations between physical functions and many patients’ experiences of their symptoms and their images of themselves. Another weakness of this study was that we had to use a different comparison group for each of the measures. Further research that is based on larger samples is needed to
investigate the manner in which bodily and psychological variables interact, including other groups of patients, where ideally only one control group should be used. The general limitation of this study is related to the focus of questions asked. They are directed towards a specific instrument, the ROBE, and its usefulness in combination with self assessment of two instruments covering the aspect of self-image, the SASB and of mental health symptoms, the SCL-90. Therefore related questions of vital interest to the clinician, dealing with the quality of interaction between therapist and patient, as well as with the quality of the patient’s movement, the evolvement of the therapeutic process and what gives it meaning are not included in this work. Future research might expand the scope presented in this study.

CONCLUSION

In conclusion our results suggest that ROBE II with a systematic unipolar scaling of domain items from the NPMP tradition, with the exception of the subscale Decreased hip movements provided a psychometrically sound basis for a body examination in a version that is compressed without lacking information from the longer version. In contrast, information from the subscales made possible the revelation of clinically relevant body patterns in a group of non-patients as well as in groups of patients with psychosomatic, musculoskeletal and schizophrenic disorders and separated the groups satisfactorily. In spite of the fact that the work on interreliability for ROBE II needs to be continued, our results support the notion that the ROBE II, assisted by the self-assessment instruments of SCL and SASB, provides a clinically relevant base for assessing patients whose somatoform diseases and stress-related symptoms can be expected to originate from complex interactions among psychological and physical problems.
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