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# Associations between physical and psychological problems in a group of patients with stress-related behavior and somatoform disorders

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The research questions in this study was: How do patients with stress-related behavior and somatoform disorders assess 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 ( $p \leq 0.01$ ) 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 20 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.

Keywords: attitude, emotions, fear, anger-hostility, muscle tension, phobic disorders, ROBE II, SASB, SCL-90, stress, self-concept, self-assessment

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## Introduction

The high incidence of sick leave due to stress-related illnesses such as exhaustion, depression, worry, anxiety and burn-out constitute a significant problem for both the health care system and society (Ekman and Arnetz, 2002). A tradition of connecting psychological evaluations with physiotherapy has been developed within the Nordic region for the purposes of treating 30 patients with such symptoms (Thornquist and

Bunkan, 1991). The Norwegian Psychomotor Physiotherapy (NPMP) which is a treatment model for physiotherapists was introduced by the psychoanalyst Braatøy and the physiotherapist Bülow-Hansen in the late 1950s (Bunkan, 40 Thornquist, and Radøy, 1982). The NPMP is based on Reichian theory, postulating that a person's character is expressed by his/her body posture, movements, respiration and by the muscles (Reich, 1972). According to his view, 45 emotional conflicts are represented in the body.

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The NPMP treatment tradition evolved in the parallel development of physical diagnostics such as the body examinations Resource-Oriented Body Examination (ROBE) (Bunkan, 1996) and the Global Physiotherapy Examination (GPE 78, GPE 52; Kvåle, 2003; Sundsvold, Vaglum, and Denstad, 1982). In Sweden, Roxendal (Roxendal, 1985) developed the Body Awareness Scale (BAS). These physiotherapy assessments are primarily designed for patients referred to physiotherapy for various kinds of pain and tension in the musculo-skeletal system and also for patients referred for minor psychiatric disorders. These assessment are practiced at rehabilitation units, primary health care units and in psychiatric clinics, and are taught in basic and advanced courses in Scandinavia (Meurle-Hallberg and Gunnerius, 1990). The original ROBE has recently been compressed into a shorter form, ROBE II, which has proved to have the capacity to distinguish between the bodily characteristics of patients with psychosomatic, musculo-skeletal and schizophrenic disorders (Meurle-Hallberg, Armelius, and von Koch, 2004).

Although the number of studies investigating the relationship between physical and psychological characteristics is increasing, the number of published studies is still limited. 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 with lower levels of education, higher degrees of chronic ailments, 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 (Mølstad et al., 1995). In another study, Kvåle and colleagues used the GPE 78 to study 177 patients who were sick-listed due to long-lasting musculo-skeletal

pain (Kvåle, Ellertsen, and 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 and 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, Ekdahl, and Borgqvist, 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 Structural Analysis of Social Behavior (SASB; Malmgren-Olsson and Armelius, 2001; Malmgren-Olsson, Armelius, and Armelius, 2001; Mattsson et al., 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 and 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.

In the light of these studies, we believe that a study of associations between ROBE II and validated measures for symptoms of mental health (SCL-90) and self-image (SASB) can provide valuable information on the relationship between bodily resources and psychological factors.

The aim of the present study was to examine the 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 questions 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)?

## 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

Background data for the patient group are presented in Table 1.

The participants consisted of almost twice as many women as there were men. 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. There were more employees than workers in the group. 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 ICD-9 (American Psychiatric Association, 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 2.

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.

**Table 1.** Age, marital status, employment and socio-economic classification in the patient group ( $n = 31$ ).

Variables	<i>n</i>	%	Mean (SD)	Range
Age total group	31	100	44.1 (9.0)	(30–61)
Women	20	65	44.6 (9.7)	(30–61)
Men	11	35	43.1 (8.1)	(33–60)
Marital status				
Married/cohabitant	22	71		
Divorced	6	19		
Single	3	10		
Employment				
Disability pension	9	29		
Sick leave, full time	11	37		
Sick leave, part time	4	13		
Vocational rehabilitation	7	21		
Socio-economic classification				
Workers	13	42		
Employees	18	58		

Eleven patients had previously been in psychiatric care, 15 patients took prescribed medication on a daily basis, 10 of these used psychopharmacological drugs, and 11 subjects were not on any medication.

### Comparison groups

Comparison groups for all three assessment tools were included. Table 3 shows data for the comparison groups for the ROBE II, SASB and SCL-90 with respect to age and gender.

The comparison group ( $n = 22$ ) for the ROBE II was composed of staff from two physiotherapy training programs (Meurle-Hallberg, Armelius, and von Koch, 2004). The comparison group for SASB ( $n = 52$ ) and SCL-90 ( $n = 51$ ) consisted of individuals who either were workers or students. For the SCL-group 6 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; Bunkan, 1994).

### Instruments

*Resource-oriented body examination—ROBE II.* The ROBE was developed by Bunkan (Bunkan, 1994) 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 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. The instrument has also been used to discriminate between different patient groups (Bunkan, 2003). Bunkan developed the ROBE to include weighted domain sum scores and a global sum score, referred to as the bodily resource score (Bunkan, 1994). A unipolarly scaled version of the ROBE: ROBE I was developed. The ROBE I includes 254 variables, which are measured on a rating scale ranging from 0–6 (Meurle-Hallberg, 1991). The psychometric properties and the applicability of the ROBE I have been confirmed and on the basis of factor analysis, presented in an earlier study, the number of items was reduced to 144. (Meurle-Hallberg, Armelius, and von Koch, 2004). This new version of the ROBE was named ROBE II. The names and number of items in the subscales of ROBE II are presented in Table 4.

Items in the ROBE II are assessed according to a set protocol with a rating scale ranging from 0 (*ideal*) to 6 (*severe*; Meurle-Hallberg, 1991). The assessment of one individual takes about one hour.

**Table 2.** Psychiatric diagnoses according to the DSM III-R and ICD system ( $n = 28$ ).

Main diagnosis	$n = 28$	Additional diagnosis
Somatoform pain disorder (DSMIII-R 307.80)	10	
Somatoform pain disorder (DSMIII-R 307.80)	1	Earlier alcohol dependence (DSMIII-R 303.90)
Somatoform pain disorder (DSMIII-R 307.80)	1	Psychoactive substance dependence, analgesics (DSMIII-R 307.80)
Somatoform pain disorder (DSMIII-R 307.80)	1	Agoraphobia, Social phobia, compulsive disorder (DSMIII-R 300.22 + DSMIII-R 300.23 DSMIII-R 330.30)
Somatoform pain disorder (DSMIII-R 307.80)	1	Schizophreniform disorder (DSMIII-R 295.40)
Somatoform pain disorder (DSMIII-R 307.80)	1	Bipolar disorder, mixed, unspecified (DSMIII-R 296.60)
Undifferentiated somatoform disorder (DSMIII-R 300.70)	2	
Special symptoms or syndromes not elsewhere classified ICD-9 number 307	1	
Unspecified mental disorder—nonpsychotic (DSMIII-R 300.90)	1	Major depression, recurrent (DSMIII-R 296.30),
Generalized anxiety disorder (DSMIII-R 300.02)	1	Earlier alcohol dependence, polysubstance dependence (DSMIII-R 303.90 and 304.90)
Panic disorder, with agoraphobia (DSMIII-R 300.21)	1	
Earlier panic disorder, with agoraphobia (DSMIII-R 300.21)	1	Major depression, recurrent, unspecified (DSMIII-R 296.30)
Primary insomnia DSMIII-R nr 307.42	1	
Migraine (ICD-9 number 346 W)	1	Earlier alcohol dependence and amphetamine dependence (DSMIII-R 303.90 and 304.0)
Stuttering (DSMIII-R 307.00)	1	
Idiopathic protocolitis (ICD-9 number 556)	1	Major depression, single episode, in full remission (DSMIII-R 296.26)
Degeneration of cerv.intervert.disc (ICD-9 number 722.4)	1	
Curvature of spine (ICD-9 number 737)	1	

The ROBE II consists of 144 items, which are grouped into five domains: Posture, Respiration, Movement, Muscles, and Reactions to physical touch. In a previous study (Meurle-Hallberg, Armelius, and von Koch, 2004) each of the five domains was factor-analyzed with a two-factor solution and ten factors were derived. Each factor was considered as a subscale. The derived factor loadings for the 144 items ( $>.50$ ) were

used as basis for the subscales and the mean of the item scores was defined as factor score.

*Posture* is measured by subscales 1 and 2. Subscale 1 includes items that contain information about protrusion of the head and shoulders and the break in body axes in standing, and head, shoulders and legs deviating from a resting position in supine. Subscale 2 gives information about distribution of body

**Table 3.** Comparison-groups for ROBE II, SCL 90, and SASB.

	n	Sex		Age mean	Age Range
		Female	Male		
Resource Oriented Body Examination (ROBE II)	22	15	7	44.2	(36–55)
Symptom Check List 90 (SCL90)	52	17*	28*	27.8*	(21–42)
Structural Analysis of Social Behavior (SASB)	52	28	24	33	(20–56)

\*Figures based on 45 persons; 7 persons did not fill in age and sex.

weight over the heels, hyper-extended knees, reduced lumbar lordosis and the pelvis tilted backwards in standing.

325 *Respiration* is measured with subscales 3 and 4. In subscale 3, the amplitude and visibility of respiratory movements in standing and supine are assessed. Subscale 4 comprises items of visible signs of increased abdominal muscular 330 activity in association with expiration, in the standing and supine positions. Elasticity in the thorax and the regularity of the breathing rhythm is assessed in the supine position.

Movements are measured with subscales 5 335 and 6. Subscale 5 indicates characteristics of

flexibility of the shoulder arch, flexion of upper neck joint, rotation of the head and upper thorax and spreading of movements through the body in standing, as well as inflection of the arms in supine. Although some of the items include involvement of the lumbar/back region, the emphasis of this subscale is on the upper part of the body. Subscale 6 includes items on range of motion in hip abduction-adduction and hip flexion is also inspected in the supine position.

340 *Muscles* are assessed with subscales 7 and 8, where 19 pairs of muscles are palpated for hard or slack consistency on the right versus left side of the body. Subscale 7 measures muscles with 345

**Table 4.** Sub-scales ROBE II with domains, names, and number of items.

Domain	Subscale name	Number of items ROBE II
Posture	Subscale 1 Flexed postural pattern	9
	Subscale 2 Reclined postural pattern	6
	Subscale 3 Decreased respiratory movements	11
	Subscale 4 Increased respiratory control	8
Movement	Subscale 5 Decreased flexibility neck & shoulder	11
	Subscale 6 Decreased hip movement	4
	Subscale 7 Slack muscular consistency	37
Muscles	Subscale 8 Hard muscular consistency	30
	Subscale 9 Assistance reactions to physical touch	16
	Subscale 10 Resistance reactions to physical touch	12
Reactions to physical touch		

350 slack muscular consistency and subscale 8 muscles with hard muscular consistency.

In the ROBE II, the items that concern the patient's involuntary assistance and/or total passivity that is: his/her capacity to relax during 355 the physiotherapeutic handling is regarded as psychological reactions.

*Reactions to physical touch* are assessed with subscales 9 and 10. In subscale 9, the patient's assistance or passivity is observed and assessed 360 while the physiotherapist retracts the shoulder arch in standing and handles inflection in the shoulders and hips as well as abduction-adduction in the supine position. One item includes Sætre's grip: an assessment of the patient's capacity for 365 relaxation in standing (Bunkan, 2000).

Subscale 10 measures the patient's involuntary resistance through the same physiotherapeutic maneuvers as in subscale 9. It is the patient's reactions to the physiotherapist touch, 370 i.e. towards the bodily closeness to another person rather than the range of movement that is assessed. The inter rater reliability of ten cases for two judges was studied with intra class correlation (ICC; Meurle-Hallberg, Armelius, and 375 von Koch, 2004). 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, respectively). The exclusion of 380 two subjects, well known to one of the raters but not to the second improved ICC from 0.24 to 0.55 for the scale Decreased respiratory movements and from 0.21 to 0.49 for the scale Increased respiratory control (Meurle-Hallberg, 385 Armelius, and von Koch, 2004).

#### *The Symptom Checklist-90 (SCL-90)*

The SCL-90 (Derogatis, Lipman, and Covi, 1973) and The Symptom Checklist-90-Revised (SCL-90-R) were developed by Derogatis 390 (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, 395 of which have been grouped into nine subscales: Somatization (12 items), Obsessive-Compulsive

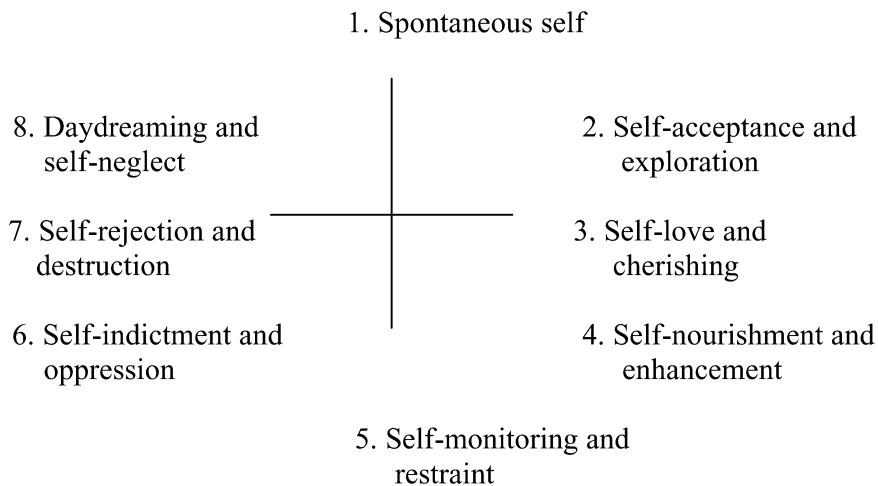
(10 items), Interpersonal Sensitivity (9 items), Depression (13 items), Anxiety (10 items), Anger-Hostility (6 items), Phobic Anxiety (7 items), Paranoid Ideation (6 items), and Psychoticism (10 items). The Additional Scale 405 with seven additional items includes information about disturbances in appetite 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 410 to which they experience that they have had each ailment on a rating scale from 0 (*not at all*) to 4 (*very much*).

Karterud et al (1995) created The Personality Severity Index (PSI) based on the SCL-90-R 415 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 420 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 425 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, 430 and interdependence, with the extremes self-control/spontaneity (Armelius, 2001; Benjamin, 1974; Öhman and Armelius, 1993). The SASB self-image measure consists of 36 questions. Patients grade how they experience each item 435 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: 1) Spontaneous self, 2) Self-acceptance/exploration, 3) Self-love/cherishing, 4) Self-nourishment/ 440 enhancement, 5) Self-monitoring/restraint, 6) Daydreaming/self-neglect, 7) Self-rejection/destruction, and 8) Self-indictment/oppression, which combine affiliation and interdependence in complementary degrees (Hartley, 1991). The 445 SASB self-image model is shown in Figure 1.

The SASB thus shows whether the individual's self-reported self-image is positive (= high high scores on the clusters that measure self-love: i.e., clusters 2, 3, and 4), or negative (= high 450 scores on the clusters that measure self-hatred;



**Figure 1.** The eight SASB clusters for self-image.

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)

455 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, 460 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 465 soundness and relevance of the SASB model has been confirmed by its use in various research and clinical settings (Benjamin, 1993). Armelius, Lindelöf, and Mårtensson (1983) developed a Swedish version of SASB and support for its validity has been reported (Armelius and Öhman, 470 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 and Öhman, 1990).

### Statistical analysis

The patient group and the comparison groups were analyzed using T-tests for independent 480 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

### 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 5.

Table 5 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 in the 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),

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**Table 5.** Significant correlations between values of ROBE II, SCL 90, and SASB for the patient group ( $n = 31$ ).

	ROBE II					
	Subscale 1 Flexed postural pattern	Subscale 2 Reclined postural pattern	Subscale 3 Decreased respiratory movements	Subscale 4 Increased respiratory control	Subscale 5 Decreased flexibility-neck and shoulder	Subscale 8 Hard muscular consistency
SCL 90						
Depression	0.37*					
Anger-Hostility	0.37*		0.45**	0.47**	0.37*	
Phobic Anxiety					0.50**	0.50**
Paranoid Ideation					0.36*	
Psychotism	0.40*					0.40*
Somatization		-0.41*				
Personality Severity Index					0.40*	
SASB						
Self-indictment and oppression (cluster 6)					0.38*	0.38*
Self-rejection and destruction (cluster 7)	0.37*					
Daydreaming and self-neglect (cluster 8)	0.45*			0.42*	0.38*	

Note. Pearson ( $r$ )\* =  $p < 0.05$ . \*\* =  $\leq 0.01$ .

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.

## 520 Comparisons of bodily resources, symptoms, and self-image in the patients and comparison groups

The statistical differences between the patient group and the comparison groups for the assessment tools ROBE II, SCL-90 and SASB are presented in Table 6.

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).

## 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.

**Table 6.** Meanvalues on ROBE II, SCL-90, SASB for the patientgroup and the comparison groups.

	Patient-group		Comparison-group		p-value
	Mean	SD	Mean	SD	
<b>ROBE II</b>					
1. Flexed Postural Pattern	1.60	0.74	1.04	0.72	0.01
2. Reclined Postural Pattern	2.16	0.82	1.72	0.33	0.01
3. Decreased Respiratory Movements	1.76	1.11	1.82	1.20	0.86
4. Increased Respiratory Control	1.78	0.98	0.73	0.42	0.00
5. Decreased Neck and Shoulder Movements	2.08	0.83	1.05	0.51	0.00
6. Decreased Hip Movements	0.99	1.01	0.11	0.26	0.00
7. Slack Muscular Consistency	0.16	0.39	0.97	0.81	0.00
8. Hard Muscular Consistency	1.61	0.64	0.85	0.71	0.00
9. Assistance Reactions to Physical Touch	0.48	0.65	0.43	0.31	0.71
10. Resistance Reactions to Physical Touch	1.16	0.96	0.54	0.40	0.00
<b>SCL 90</b>					
1. Somatization	1.62	0.63	0.47	0.51	0.00
2. Obsessive-Compulsive	1.50	0.81	0.76	0.58	0.00
3. Interpersonal Sensitivity	1.11	0.78	0.58	0.50	0.00
4. Depression	1.44	0.98	0.74	0.72	0.00
5. Anxiety	1.22	0.82	0.56	0.59	0.00
6. Anger-Hostility	0.75	0.68	0.44	0.43	0.03
7. Phobic anxiety	0.95	0.96	0.18	0.24	0.00
8. Paranoid Ideation	0.86	0.70	0.40	0.51	0.00
9. Psychoticism	0.55	0.53	0.24	0.35	0.01
10. Additional Scale	1.49	0.79	0.61	0.45	0.00
11. The Personality Severity Index(PSI)	1.12	0.63	0.48	0.39	0.00
12. Additional Global Severity Index (GSI)	1.27	0.72	0.51	0.40	0.00
<b>SASB</b>					
1. Spontaneous self	33.97	18.81	40.92	12.12	0.07
2. Self-acceptance and exploration	47.94	24.16	61.29	18.11	0.01
3. Self-love and cherishing	44.55	23.71	58.37	16.82	0.01
4. Self-nourishment and enhancement	45.58	19.27	58.23	13.17	0.00
5. Self-monitoring and restraint	48.81	20.94	51.85	17.42	0.50
6. Self-indictment and oppression	33.39	25.47	25.79	20.52	0.16
7. Self-rejection and destruction	30.29	20.40	16.19	14.69	0.00
8. Daydreaming and self-neglect	28.94	15.67	19.04	10.84	0.00

550 The assessment with ROBE II subscales  
 Increased respiratory control, Flexed postural  
 pattern and Decreased flexibility in neck and  
 shoulders provided signs of bodily impairment  
 that showed close association with Anger-  
 555 Hostility (SCL-90) and Daydreaming and self-  
 neglect (SASB). It is also noteworthy that, among  
 the ROBE II subscales, only Increased respira-  
 tory control had a significant correlation with  
 the Personality Severity Index (PSI) which pur-  
 560 portedly 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 that differentiated the patient group from the non-patients in 565

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 reexamined by Bunkan (Friis et al., 2002) and the group of chronic patients in Monsen's study (Monsen, 2002). By correlating the GPE-78 with the MMPI, Kvåle, Ellertsen, and Skouen (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 armouring and respiration

According to Bunkan respiration is the most important domain in the NPMP tradition, examined in both upright and supine position (Bunkan et al., 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 (1972) as Muscular Armouring, 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 6). At the same time, the subscale of Somatization correlated significantly with only one of the ROBE II subscales (Table 6), 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, 670 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 675 opposite postural patterns, a negative relationship between reclusion and somatization, a corresponding positive relationship between Flexed postural pattern and Somatization would be expected. Such a correlation was not obtained 680 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 685 of strategies and instruments that are used to assess somatoform disorders, Hiller and 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 690 but only subjectively perceived.

In the paper "Rethinking somatization," McWhinney, Epstein, and Freeman (2001) argued that the frustration and difficulty experienced by physicians who set the diagnosis of 695 somatoform disorder is due to the unsatisfactory status of the concept of somatization, and the assumptions on which it is based. In Mc Whinney et al.'s opinion, the concept of somatization perpetuates the prevailing dualistic 700 distinction between mental and physical illness in the sense that attention is given to emotions only in certain kinds of illness, after diagnostic testing is unclear. Our study suggested that although the patient's self assessments mirrored 705 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, as with 710 physicians, the physiotherapist who assesses bodily resources with ROBE II does not find observable signs of phenomena constituting the 12 items of the Somatization subscale of SCL: 715 1) Headaches, 2) Faintness or dizziness, 3) Pains in heart or chest, 4) Pains in lower back, 5) Nausea or upset stomach, 6) Soreness of muscles, 7) Trouble getting your breath, 8) Hot or

cold spells, 9) Numbness or tingling in part of 720 the body, 10) Lump in your throat, 11) Feeling weak in parts of your body, and 12) 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 725 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, 730 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 735 disorder it is likely that the physiotherapist at 740 the same time works with the patient's emotions, that is, with "the lived body" (Bullington, 1999; Rosberg, 2000; Thornquist and Bunkan, 1991).

It is reasonable to assume that some of the 745 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, 750 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 755 emphasize the importance of managing the negative conditions of aggression in somatic disorders (Downing, 1997; Monsen, 2002; Vlaeyen and Linton, 2000). Others have reported that neuroticism is related to the 760 experience of somatic disorders, and that neuroticism and negative self-image partly reflect the same aspect of the personality (Pincus and Wiggins, 1990). It is well established that a negative self-image is associated with a range of other 765 problems such as bulimia, anorexia (Björck et al., 2003) and various other psychological disorders

(Armelius and Granberg, 2000; Edénius and Falk, 2002; Öhman and Armelius, 1990; Ruiz, Pincus and Bedics, 1999) 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, Ekdahl, and Hansson (1999) found no association between personality measured with the Sivik 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: (a) Increased respiratory control, (b) Flexed postural pattern, and (c) 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 would be used.

### Conclusion

In conclusion, the ROBE II provides a valuable tool 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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