Correlations Between Tests for Grounding, Breathing and Self-efficacy in Individuals With and Without Chronic Pain: Who is "Standing with Both Feet on the Ground?"

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Abstract

Postural balance (grounding) and breathing are basic psychomotor functions that can be disturbed in patients with chronic pain. Self-efficacy plays an important role in treatment programs that address improved coping with pain. The aim of this study was to evaluate whether balance and breathing tests could discriminate between a group of patients with chronic pain and a healthy group and to test their correlations with psychometric tests. A conceptualization of grounding that incorporates physical and psychological factors is proposed. **Methods**: In this cross-sectional study 62 patients with chronic pain and 40 healthy individuals were examined using physical tests to measure postural balance and breathing and psychometric tests to measure self-efficacy and pain. Relationships among the measures were analyzed. **Results:** Significant differences ($p<0.001$) were found between the patient group and the control group in all balance and breathing tests and in the self-efficacy tests. Participants who performed correctly in two or more of the balance tests were ten times more likely to report high self-efficacy than those who did not. Conclusion: The balance, breathing, and self-efficacy tests discriminated significantly between the groups. Concurrent validity between some balance tests and self-efficacy could be shown. Further studies to confirm that predictive validity should be done.

Keywords: chronic pain, grounding, breathing, rotation, postural balance, self-efficacy

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A majority of patients with low back pain and pain in general are categorized as having non-specific back pain (NSBP, no clear physical cause) or medically unexplained symptoms (MUS) (Kirmayer, Groleau, Looper, & Dau, 2004). Many develop chronic pain lasting longer than three months (Chou & Shekele, 2010). There is evidence that depressed mood, distress, fear-avoidance behavior, and tendencies to somaticize and catastrophize are important background factors and

predictors of the development of chronic pain (Pincus, Burton, Vogel, & Field, 2002; Vlaeyen & Linton, 2000). Some NSBP patients have coordination dysfunctions, which can lead to mechanical pressure on tissues and joints (Luomajoki, 2011; O'Sullivan, 2005). Understanding the relationship between NSBP, depression and coordination dysfunction could lead to novel treatments. This study hypothesizes that motor patterns could be effective predictors for the development of chronic pain.

The experience of fear reflexively activates muscles in an arousal and startle reaction pattern released from the lower parts of the brain in the reticular formation (RF). The RF connects directly to the amygdala in the limbic system, setting the arousal level and processing emotional unconscious material, which then connects to the prefrontal cortex where fear (or the realization that a fear response is not necessary) becomes conscious (Davis, Falls, Campeau, & Munsoo, 1997; LeDoux, 1996). When the threat is sudden, such as an unexpected sound or visual impression, a free fall, and/or bodily pain, this unconscious startle reaction is released (Brown et al., 1991), leading to the following somatic response patterns: The muscle tonus increases in the flexor muscles around the center of the body to protect the solar plexus and diaphragm, the neck and back bend forward, the arms and elbows flex, the shoulders are protracted and raised, the abdominal muscles contract, the person breathes in and holds the breath, the intercostal muscles contract, and tonus in the lower extremities increases in preparation for running.

If this arousal pattern persists over time it creates a vicious cycle in which additional fear is triggered, which further triggers the sympathetic nervous system, which increases the static sensitivity of the muscle spindles, which triggers pain, which again triggers fear, beginning the cycle again (Johansson, Sjölander, Djupsjöbacka, Bergenheim, & Pedersen, 1999). How easily the startle response is released depends on the general emotional status of the amygdala (Bradley, Lang, & Cuthbert, 1993).

A person who experiences adult or developmental trauma is likely to have sustained a shock reaction, with high tonus above the diaphragm muscle and very low tonus below the diaphragm muscle – a shutdown described by Porges (2011). Johansson et al., (1999) state that increased activity in the sympathetic nervous system decreases the precision in the servomechanism of proprioceptors in the joint capsules and muscles. One cause of persistent low back pain may be the steeper slope position of the diaphragm muscle (due to increased tension), which has the effect of over-stabilizing or stiffening the posture (Kolar et al., 2012). When the fear patterns described above persist, breathing muscles can stiffen, contributing to a decreased rotation of the postural muscles in the trunk (B.H. Bunkan, ongoing personal communication, 2003-2014).

Being able to stand physically on the ground with both stability and flexibility requires adequate neuromuscular postural function from the trunk, legs, and feet. To feel safe while standing derives also from an inner transferred feeling of psychological safety – being grounded and centered. This experience of being grounded has a deeper psychological meaning relating to existence and the ability to ground oneself in life (Gyllensten, Skär, Miller, & Gard, 2010; Lowen, 1976; Merleau-Ponty, 1962). The expression "to stand with both feet on the ground" speaks a mind-body language with a symbolic meaning, but can it be explored scientifically?

Another area of study, self-efficacy, has been examined in the pain literature, but has not been assessed related to postural balance and movement. Self-efficacy is the belief in one's own ability to effectively control specific events in life (Bandura, 1997). Self-efficacy can account for significant variance in the treatment outcome of pain patients. It plays an important role in the improvement of coping with NSBP (Denison, Asenlöf, Sandborg, & Lindberg, 2007). Finally, in medical research, measures of postural sway and center of pressure, while an individual stands on a force platform, are

common methods for testing postural control (Muto et al., 2014; Ruhe, Fejer, & Walker, 2011). No study has been found that correlates balance and breathing tests to psychometric tests in patients with chronic neck and back pain.

Aims

The general aims of this study were:

1) To assess possible differences in balance and breathing function between a group of healthy individuals and a group of patients with chronic pain, and

2) To validate six breathing and balance tests in relation to several psychometric tests.

Research questions

1. Do the six balance and breathing tests discriminate between a healthy group and a group of patients with chronic musculoskeletal pain?
2. Is there a difference in level of self-efficacy between the healthy group and the patient group?
3. Is there an association between the three balance tests and the psychometric tests for self- efficacy and experienced pain?
4. Is there an association between the three breathing tests and the psychometric tests for self-efficacy and experienced pain?
5. Is there an association between the sum of the balance tests, the sum of the breathing tests and the level of self-efficacy?
6. Is there an association between the sum of the balance tests, the sum of the breathing tests and experienced pain?

Methods

Participants

All participants were required to speak German and to be capable of understanding the consent and assessment forms. For the patient group (PG), 62 inpatients with musculoskeletal pain lasting more than three months were consecutively chosen over a period of five months within a hospital-based pain clinic. The inpatients were chosen by the head of the Physiotherapy Department according to the inclusion and exclusion criteria described below.

The diagnoses used were those made by a medical doctor and found in patient charts. Allowed diagnoses were: fibromyalgia, chronic fatigue syndrome, non-specific low back pain, non-specific musculoskeletal pain, post-operative persistent pain, lumbago, cervicalgia, chronic panvertebral syndrome, muscular dysbalance and whiplash injury with persistent pain. Excluded diagnoses were: radiating pain with a neurological correspondence to one segment, herniated disc diagnosed within the last six weeks, and pain due to malignancy. The resulting participants were 35 women and 27 men between the ages of 30 and 60 (see Table 1).

The control group (CG) was recruited in the first author's home village. A flyer requesting voluntary participation was posted in letterboxes, and respondents came to a private clinic for assessment. To be considered for the CG, individuals needed to be healthy, with no musculoskeletal pain lasting longer than three weeks during the last year. The resulting group consisted of 40 persons (24 women and 16 men) (See Table 1.).

The Research Ethical Committee of the Medical Faculty of Lund University, Sweden approved

the study, LU 368-03. Participants were informed in writing about the study before they agreed to participate. The correspondence contained information about the purpose of the investigation, that participation was voluntary, that participants could withdraw at any time and that the data would only be presented confidentially with each person being given a number.

Table 1: Demographic and Pain Characteristics of Participants

	Patient Group (n=62) %	Control Group (n=40) %
Mean Age	44.2	45.3
Women	35 (56%)	24 (60%)
Men	27 (44%)	16 (40%)
Duration of pain		
3-12 months	15 (24%)	
1–2 years	11 (17%)	
> 2 years	36 (59%)	
Married/cohabiting	37 (60%)	36 (90%)
Single	25 (40%)	4 (10%)
---- citizen	43 (69%)	40 (100%)
Foreigners living in ---	19 (31%)	0
Education		
Compulsory school or Less	17 (27%)	0
Trade school	32 (52%)	12 (30%)
College	10 (16%)	15 (38%)
University	3 (5%)	13 (32%)

Materials and Procedures

Patients were scheduled for this project as well as for treatment as usual (TAU) within the clinic. TAU included ergonomic training, strength and endurance training, pool exercises and relaxation exercises. The tests were carried out once by the first author of this paper at any time during the treatment period of three to six weeks (cross-sectional design).

Clinical tests.

Testing began with the breathing and the balance and coordination tests, followed by the psychometric tests. After the psychometric tests, the breathing and balance tests were repeated. The best result of the breathing and balance tests was counted. The balance tests used in the present study have been validated for measuring postural sway in an unpublished pilot study for NSBP patients (Johansson, 1991).

Standing on one leg (Johansson, 1991). This test examines the participant's ability to maintain a centerline while standing on one leg with arms hanging at the sides. Participants chose which leg to stand on first and results for the best leg were chosen for the report. Three tries were allowed. Scoring is as follows: 0 = the person can stand correctly >30 seconds; 1 = the person can stand without putting the lifted foot back on the ground for at least 30 seconds but demonstrates many

equilibrium reactions in the arms, leg and trunk; 2 = the person cannot stand on one leg for 30 seconds.

Standing on one leg while rotating the head left and right (Johansson, 1991). This test examines stability combined with flexibility in rotation of the upper body parts, neck, and upper thoracic spine. Participants chose the turning rhythm by themselves. Scores ranged from 0-2 as described above.

"Standing ski step" (Johansson, 1991). This test was chosen to examine stability combined with flexibility in the legs and pelvis, the lumbar and lower thoracic spine, and to test the participant's ability to rotate the spine and coordinate between the left and right sides of the body. It consists of long alternating forward and backward steps with reciprocal arm movement: five steps with the left leg, five with the right and five with the left. To achieve a full score, the participant must be able to change legs twice and count the 15 steps him – or herself. The trunk must rotate. Scoring is as follows: 0 = test is performed correctly; 1 = person can perform correctly after being prompted (e.g., can do reciprocal movements after being reminded that he or she is moving the same arm and leg forwards and backwards); 2 = person cannot perform the reciprocal movements correctly with rotation in the trunk, even with prompting.

Deep breath location. During all three breathing tests, the participant sat on a chair while the examiner observed the breathing. The deep breath location was categorized as either high costal or basal costal. A controlled diaphragm breath was categorized as basal costal.

Deep breath test. The increase of chest circumference in cm, while deep breathing was measured with a tape measure held at the level of the xiphoid process.

Chest elasticity. The quality of chest elasticity was assessed with a modified Bunkan test (Bunkan, 2003). The examiner puts both hands on the chest to assess elasticity while compressing the chest at the basal costal level. Scoring is as follows: 0 = normal elasticity (popularly said "like a raw fillet of meat"); -1 = hypotonic ("like whipped cream"); 1 = slightly hypertonic; and 2 = very hypertonic ("like a hard tire").

Psychometric tests

All psychometric tests presented below have been tested for reliability and validity for patient groups with NSBP by the authors mentioned for each test.

Visual Analogue Scale (VAS Pain). Pain intensity was assessed with a 10-cm visual analogue scale (Huskisson, 1983). The end point on the left was marked 0 (no pain at all) and the end point on the right was marked 10 (unbearable, maximal pain). The patient marked the line to indicate pain intensity experienced during the last three days. The distance from the left to the right end was measured in cm.

Arthritis Self-Efficacy Scale (ASES)-D – German version. Self-efficacy expectancies concerning coping with pain and other disease-related symptoms (e.g., "How sure are you that you can reduce the symptom at least a bit?") were assessed with the 8-item validated short form German-language version of the American ASES (Lorig, Chastain, Ung, Shoor, & Holman, 1989; Müller & Hartmann, 2003). Values range from 1 (very uncertain) to 10 (very certain). Higher scores indicate more strongly perceived self-efficacy. Each score was calculated separately, as well as the mean of the eight scores. In a German investigation of 148 fibromyalgia patients (Müller & Hartmann, 2003) the maximum score of certainty was 8 and the total mean score was 4.7 (SD, 1.6). In the present investigation, "arthritis or fibromyalgia" was replaced by "disease/symptom." The ASES-D was used only for the patient group.

General Self-efficacy. This assessment tool intends to reflect a personal trait (Jerusalem &

Schwarzer, 1992). It queries an individual's expectancy of general competence and capacity to deal with difficulties and barriers in everyday life (e.g., "I can always manage to solve difficult problems if I try hard enough.") It contains 10 items scored on four scales: the higher the score, the higher the estimated general self-efficacy. The maximum score is 4. Collection of Internet data from 10,000 people using this assessment tool yielded a mean value of 2.9 (SD 0.4). Schwarzer, Mueller, and Greenglass (1999) showed that for a sample of East German adults moving to West Germany after the wall had fallen, the general self-efficacy scale predicted psychosomatic symptoms two years later. Both groups answered this questionnaire.

Questionnaire on Competence and Control Belief (Fragebogen zu Kompetenz und Kontrollüberzeugungen; FKK). This instrument (Krampen, 1991) was tested on 2028 German adults and found to be reliable and valid (Cronbach's Alpha: .70 to .90; Spearman-Brown Split-half reliability: .64 to .82). It is also correlated with the Beck Depression Inventory. It is based on the action theory of personality and the control belief theory, which says that knowing the systematic pattern of personality variables makes it possible to predict a certain course of action. Beliefs and behaviors are based on, and continuously modified by, multiple sources of sensory information. A control belief is defined as the extent to which an individual believes he or she can personally influence a situation (internal control belief) or not (external control belief, or destiny). The 32-item questionnaire contains four parts, each with eight items. Each item has six scores rated from 1 (very false) to 6 (very true). The four parts are: 1. FKK/SK "Selbstkonzept eigener Fähigkeiten"/self-concept of personal competence, mean value 31.9 (SD 6.1), with questions like, "It mainly depends on me whether other people adjust to my wishes."; 2. FKK/I "Internalität"/ internal control, mean value 32.4 (SD 5.4); 3. FKK/P "Soziale Externalität"/socially caused externality or powerful other, mean value 26.1 (SD 5.9); and 4. FKK/C "Fatalistische Externalität"/fatalistic externality or chance, mean value 26.8 (SD 6.2).

In the present study, each score was counted separately, and a mean score for each subscale was computed. A low FKK/SK score points to low self-efficacy. A low FKK/SK score together with high FKK/P and FKK/C points to depression with a strong belief in external control, a situation similar to learned helplessness. People with very high scores of FKK/SK, and very low scores of FKK/P and FKK/C are unrealistic in their estimation of their own personalities (Krampen, 1991). Both groups used this instrument.

Statistics

To compare patients and controls the Fisher's exact test was used to analyze categorical variables. The result "Yes" is defined as a score of 0 (can perform the balance test completely satisfactorily). The result "No" is defined as a score of 1 or 2 (cannot perform the balance test satisfactorily or cannot perform it at all). The Mann-Whitney U test was used to analyze ordered categorical data such as the chest expansion, chest elasticity, and self-efficacy tests. See Table 2.

Associations between the psychometric tests and the balance functions were calculated with Spearman's rank correlation coefficient. Fisher's exact test was used to measure associations between variables measured on a nominal scale. Stepwise logistic regression analysis was performed to determine the impact of the psychometric tests and VAS pain on the balance functions. The probability tests were two-tailed. For the logistic regression analysis, the three balance tests were counted together (range = 0-6), providing a maximum sum of 0 or a minimum of 6. The variables were dichotomized and divided into two groups: Good balance (0-2) and poor balance (3-6). The self-efficacy tests were divided below and above the mean values obtained in this study. Self-efficacy scores below and above the mean value were defined as low and high respectively. VAS pain ≤6 was counted as low pain and >6 was counted as high pain.

Results

Highly significant differences ($p<0.001$) were found between the PG and CG in all variables. Individuals in the PG had poorer balance, used high costal breathing more often, expanded the chest less during deep breathing, had a less elastic chest and reported lower self-efficacy than the CG participants (see Table 2).

Table 2: Comparisons of Balance, Breathing, and Self-efficacy Test Results for Patient Group (PG) and Control Group (CG) Using Fischer's Exact Test (Balance Tests and Tests for High Costal and Basal Costal Breathing) and Mann-Whitney U Test (Chest Expansion, Chest Elasticity and Self-Efficacy Tests)

Test Type		PG (n=62)		CG (n=40)		*p*
Balance						
One leg stand	Yes	29	(46.8%)	39	(97.5%)	<0.001
	No	33	(53.2%)	1	(2.5%)	
One leg stand with head turn	Yes	8	(12.9%)	28	(70%)	<0.001
	No	54	(87.1%)	12	(30%)	
Ski step	Yes	6	(9.7%)	35	(87.5%)	<0.001
	No	56	(90.3%)	5	(12.5%)	
Total balance score = 0-2[a]		19	(30.6%)	40	(100%)	
Total balance score = 3-6[a]		43	(69.4%)	0		
Breathing						
High costal		36	(58.1%)	4	(10%)	<0.001
Basal costal		26	(41.9%)	36	(90%)	
Chest expansion median[b]	(range)	2.0	(-1.5-5.0)	3.3	(0.0-7.5)	<0.001
Chest elasticity median[a]	(range)	1.0	(-2-2)	0.0	(-1-1)	<0.001
Self-efficacy		M	SD	M	SD	
ASES-D		4.8	1.7			
General self-efficacy		2.7	0.7	3.2	0.4	<0.001
FKK/SK		29.8	8.0	36	4.6	<0.001

Note. ASES-D = American Self-Efficacy Scale-Deutsch. FKK/SK = Questionnaire on Competence and Control Beliefs/Self-concept of Personal Competence (title translated from the German).

[a] For balance and breath elasticity scores only, lower scores indicate better balance and higher chest elasticity.

[b] Measured in cm.

Moderate correlation was seen between standing on one leg with and without head turning and general self-efficacy, ASES-D and FKK/SK (see Table 3). The standing ski test correlated only to general self-efficacy. When the sum of the balance tests was calculated, the correlations to self-efficacy tests increased in two tests. None of the breathing tests correlated with the psychometric tests. Both VAS pain and the balance tests showed only a weak correlation to the test of standing on one leg.

Table 3: Correlations of Balance to Self-efficacy tests and Pain in the Patient Group, using Spearman Rank Order Correlations

Balance Test	General SE	ASES-D	FKK/SK	Pain
Standing on one leg	-.46***	-.37**	-.44**	.29*
Standing on one leg with head turn	-.42***	-.49***	-.38**	ns
Ski step	-.47***	ns	ns	ns
Sum balance (0-6)	-.57***	-.47***	-.46***	

Note. General SE= general Self-efficacy. ASES-D = American Self-Efficacy Scale – Deutsch. FKK/SK = Questionnaire on Competence and Control Beliefs/Self-concept of Personal Competence (title translated from the German).
ns= not significant, p>.05, significant *p<.05, **p<.01, ***p< .001
Table does not include breathing tests. Correlations between breathing measures and Self-efficacy tests were not significant.

To determine the impact of the psychometric tests (three self-efficacy tests and VAS pain) as predictors of the sum balance score, a stepwise logistic regression was carried out. Since the breathing tests did not correlate with the psychometric tests, they were removed from the model. The sum balance score was dichotomized as good (0-2) versus poor (3-6) balance, and VAS pain was dichotomized as below versus above 6 cm. The three self-efficacy tests were dichotomized as below and above mean values for this study. The resulting odds ratio and confidence intervals are presented in Table 4.

The variable that best explained good balance was an ASES-D score above the mean value of 4.8. (R^2 = 0.28). Odds were 10 times higher of having good balance if a person in the PG scored >4.8 on the ASES-D. The more a person in the PG believed that he or she could handle and have an impact on pain, the better the person's coordination was while standing. VAS pain did not predict good balance since the confidence interval contained the value one. The wide confidence intervals point to an uncertainty within the estimated odds ratio because very few patients succeeded in the balance tests.

Table 4: Summary of Univariate Logistic Regression Analysis Predicting Having Good Balance in the Patient Group (n=62)

Measure	OR	95% CI
ASES-D > 4.8	10.0	[2.5 - 39.7]
General Self-efficacy > 2.7	6.1	[2.0 - 18.2]
FKK/SK > 30	4.6	[1.6 - 13.5]
VAS pain < 6	0.4	[0.1 - 1.3]

Note. Balance measure used was the dichotomized sum balance score. CI = confidence interval for odds ratio (OR). ASES-D = American Self-Efficacy Scale – Deutsch, FKK/SK = Questionnaire on Competence and Control Beliefs/Self-concept of Personal Competence (title translated from the German). VAS = Visual Analogue Scale.

Of the 20 patients who scored high on the FKK/P (powerful others) and FKK/C (chance control) together with a low score on FKK/SK (self-concept of personal competence), a sign of learned helplessness and depression, 18 of these patients also reported low self-efficacy on the ASES-D and general self-efficacy instruments. 19 of the 20 also had poor balance (scores of 3-6).

Discussion

Highly significant differences were found between the PG and CG in all variables assessed. The groups differed significantly in the location of the breath and in the ability to breathe deeply and thus increase the chest circumference, with more PG participants showing high costal breathing. Sudden or developmental trauma can fixate a person in a chronic startle, freeze or shock reaction with high costal breathing, described by Porges (2011).

PG participants showed less elasticity in the chest, consistent with the findings of Bunkan, Opfjordsmoen, Moen, Ljunggren, & Friis (1999, 2003). This stiffness could be a sign of guarded behavior, in general. It may also be a sign of increased tension in order to withhold emotions, a phenomenon commonly seen by body psychotherapists and suggested by Reich (1949) and Lowen (1976). These possibilities could be researched further using measures of emotional styles and breathing.

The breathing tests did not correlate significantly with the psychometric tests, yet differentiated the PG and CG very well from one another. The differentiation of the breathing location was very approximate–high costal and basal costal. The basal costal group may have included persons with controlled diaphragm breathing, which could possibly indicate a freeze reaction with high tonus. Very few PG participants were able to expand the chest as much as even the poorest performers in the CG. Additional research could tease apart potential differences between patients with basal costal and controlled diaphragm breathing.

The balance tests of standing on one leg and turning the head from side to side and the standing ski step were the most discriminating tests. They include rotation of the neck and trunk, which are likely to be influenced if a person experiences increased tonus over time. These results are consistent with those of another study of chronic pain patients, in which a lower degree of trunk rotation during walking was found to be due to hyperstable coordination patterns that indicated guarded behavior (Selles, Wagenaar, Smit, & Wuisman, 2001). In the present study, some of the patients who performed poorly standing on one leg were unable to stand even five seconds before losing their balance. Based on palpating muscle consistency, Bunkan et al., (2003) found that the strongest discriminators between healthy subjects and patients with pain, psychosis or nonpsychotic mental disorders were hard central muscles and slack peripheral muscles. The consistency of the leg muscles was not assessed in this study.

PG participants might also have been exhibiting learned helplessness (Seligman & Maier, 1967). From a psychomotor developmental perspective it is possible that their own will has not been allowed expression (stamping, kicking), so that a healthy charge has not been developed in the legs (Lowen, 1976). This study indicates that if a person is unable to stand on one leg for longer than 30 seconds, he/she is more likely to have a low self-efficacy score. The sum balance correlation coefficient of the psychometric tests was moderate (r = -.46 to -.57), indicating that factors other than self-efficacy could influence and explain poor or good balance. Participants with high scores (>4.8) on the ASES-D were 10 times more likely to have good balance.

Since the results of the balance tests were not linear, a univariate logistic regression analysis in which balance scores were dichotomized into clinically relevant cutoffs (poor balance = 3-6 and good balance = 0-2) was done. Of the self-efficacy tests, the ASES-D best explained the correlation between balance and self-efficacy. The other two self-efficacy scales did not add additional explanations. A German study of patients with chronic pain showed that high self-efficacy (ASES-D) correlated with a better treatment result (Müller & Hartmann, 2003). Another study points to the correlation between low fear-avoidance and high self-efficacy (Denison et al., 2007).

In this study, the mean value of the ASES-D within the PG (4.8) was close to the mean value of 4.7 obtained in a study of patients with fibromyalgia (Müller & Hartmann, 2003). The value is thus sufficiently dichotomized in the calculation for predictors of good balance. Twenty patients had a low score on FKK/SK and a high score on FKK/ PC, signifying learned helplessness and depression. This is in accordance with Müller and Hartmann's findings (2003), which showed strong correlations among depression items in the ASES-D, general self-efficacy, and pessimism. Clients often express their inner experienced helplessness and depression as pain. Of particular interest in the present study is that 19 of these 20 patients also had poor balance (scores of 3-6). Further studies using a larger sample size could verify these findings statistically.

Of the three balance tests only one correlated with a reported experience of pain (VAS>6) and this correlation was weak. Therefore, the threshold of > 6 cm was not a good dichotomized predictor for good or poor balance. It is possible that only very high pain intensity levels affect the grounding capacity. In the pain clinic of Valens, Switzerland, VAS pain with a cutoff >9 was estimated as a negative predictor of treatment outcome.

The present study suggests the importance of integrating both balance and self-efficacy tests in the clinical assessment of patients with pain. For the general practitioner, psychotherapist

or physiotherapist working with NSBP patients, it might be helpful to have access to easily manageable balance tests without the need for technical equipment. Such tests could identify individuals with pain who may need extra support in trusting their own competence, or in adjusting to reality by increasing their true self-efficacy instead of overestimating their capacity. NSBP patients are usually medically oriented and do not want to hear anything about psychological traits. A somatic test that says something about patients' psychological state could be valuable for general practitioners and therapists.

Limitations

This study has a number of limitations. Although the CG and PG were well matched in terms of sex and age, the group contained mostly Swiss participants with higher education and who were cohabiting or married in the CG. These variables might have influenced self-efficacy, which was found to be higher in the control group. Even though a standardized scoring was used and the observer was very experienced, using only one observer (the first author) could lead to bias. Another method would have been to videotape the tests and study the films afterwards, without the raters having knowledge of participants' group membership.

The wide variance coefficient points to an uncertainty in the estimated odds ratio, due to the small number of people in the PG who could perform the balance tests correctly. Increasing the number of individuals in the PG in a future study would allow for more definite statistical results concerning correlations between poor balance and low self-efficacy.

Conclusions

The present study shows that the postural balance, breathing tests, and self-efficacy tests highly discriminated between the PG and CG. Two of the balance tests and especially their sum score systematically correlated with all three self-efficacy scales. In contrast, the breathing tests did not correlate with the tests of self-efficacy.

The folkloric expression "to stand with both feet on the ground" generally refers to a stable and realistic person who can coordinate the body in a flexible way. This study echoes the expression.

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WRITING ABOUT BODY PSYCHOTHERAPY

An invitation to write for us, with us, with support along the way. Your writing can contribute to and enrich the 'body' of critical and reflective content, as well as to the clinical expertise, in the 'field' of body psychotherapy.

Whom can you write for?
We suggest that – for a professional article – you consider:

The EABP/USABP peer-reviewed **International Body Psychotherapy Journal** (for original work only): www.ibpj.org
The peer-reviewed journal of Body, Movement and Dance in Psychotherapy (for original work only): www.tandfonline.com/toc/ tbmd20/current#.VBfpFS6wJRU
Or: (for German language authors) **körper – tanz – bewegung:** Zeitschrift für Körperpsychotherapie und Kreativtherapie: www.reinhardt-verlag.de/de/zeitschrift/51830
(You will find the necessary "instructions for authors" on their various websites.)
Or: for something a bit more conversational: **Somatic Psychotherapy Today:** https://www.SomaticPsychotherapyToday.com
Or: Something for a newsletter of your particular professional association, modality association, or national association in psychotherapy;
Or: A comment or a thread in one of the **Somatic Perspectives LinkedIn** group discussions, facilitated by Serge Prengel: www.linkedin.somaticperspectives.com
Or: Possibly, a chapter for an edited book, on a particular theme, possibly like one of the series being published by Body Psychotherapy Publications **(BPP)**: www.bodypsychotherapypublications.com.
Or: Something to be published somewhere else, at some other time, in a different medium; or for a personal internet blog; or . . . maybe just for your personal journal.

What can you write about?
You can write about attending a recent Congress, or seminar, or about attending a different event; - or about your student thesis; - or your experience of writing your student thesis; - or a special or particularly interesting case history; - or an aspect of your personal therapy; - or about working with a particular client group; - or about a development of theory or practice; or - even about your reflections on the field of Body Psychotherapy.

How to get started writing professionally?
There is an article in the journal of Body, Movement & Dance in Psychotherapy www.tandfonline.com/doi/ full/10.1080/17432979.2010.530060#.VBfsNC6wJRU (You can also find a free copy here.)
And there are some recent guidelines about how to write a professional Body Psychotherapy Case Study: www.eabp.org/researchcase-study-guidelines.php. There are also many articles on the Internet (in different languages) about how to write.
If you want any further assistance with where to publish, or with the process of editing, or re-editing, or with the complications of the publication process, the following people may be able to offer you some help. They are all professional body psychotherapists, editors and writers:
Nancy Eichhorn: Nancy@NancyEichhorn.com
Jacqueline Carleton: jacarletonphd@gmail.com
Gill Westland: gillwestland@cbpc.org.uk
Jennifer Tantia: JFTantia@gmail.com
Courtenay Young: courtenay@courtenay-young.com

Sincerely,
EABP Publications Committee
http://www.eabp.org/publications.php

Squaring the Circle:
Bridging the Gap Between Research and Practice
About the EABP Collaborative Practice Research Network (CPRN)

The awareness of the importance of fostering different models of research, particularly those linked more closely to the actual practice of body psychotherapy and those encouraging a two-way communication between researchers and practitioners, has led to the creation of the EABP Collaborative Practice Research Network.

This is an exciting new initiative to provide a forum for dialogue, debate and the development of innovative and creative research methods and projects that assist clinical practice and help body psychotherapy (and/or somatic psychology) to develop an empirical underpinning of its professional practice.

The aim is to broaden knowledge of the field of body psychotherapy through communities of practice and clinical research. It explores how a CPRN can transform perceptions of psychotherapy research and practice, strengthen connections between members, and encourage continuous development and co-creation among participants. This important initiative is an opportunity to make a significant difference within our profession and to develop – together – the foundations of both scientific and clinical practice research.

Specifically, we are planning to explore and develop, at local and international levels, a variety of strategies to support practitioners' research and look at what types of research potentially provide a broadening of our understanding and practice of psychotherapy, and how various types of research advance, improve and extend our knowledge of body psychotherapy. We will do this by bringing together practitioners and researchers from around the world, both online and face-to-face, to discuss ways of bridging the gap between clinical practice and research.

The committee has organized two symposiums in conjunction with the 2012 and 2014 EABP Congresses. The next symposium will be held during the 15th European Congress of Body Psychotherapy in Athens Greece, 13-16th October 2016.

We would like to invite you to join us and become part of this exciting and innovative initiative. If you are interested please contact Sheila Butler and Herbert Grassmann - cprn@eabp.org

EABP Science and Research Committee - Sheila Butler, Herbert Grassmann (chairperson), Frank Röhricht, Maurizio Stupiggia, Joop Valstar, Courtenay Young and Jennifer Tantia www.eabp.org/research-scientific- committee.php

Strengthening links between practitioners and researchers at every stage of the process

News:
The Society for Psychotherapy Research (SPR), an association devoted to the development and dissemination of research on psychotherapy has some exciting upcoming SPR events:

- *The International Annual Meeting in Philadelphia,* USA in June 2015 from 24th to 27th June.
- *The European Conference on Psychotherapy Research* in Klagenfurt, Austria, September 24th to 27th, 2015, and the planned 2016 International Meeting in Jerusalem, Israel in June 2016.

You might also like to browse the Psychotherapy Research Journal pages, especially the Special Issues and the online resources; there is a lot of information on the integration of theoretical, empirical and clinical knowledge in psychotherapy. See http://www.psychotherapyresearch.org

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Connecting professionals, exchanging expertise, enabling collaboration

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