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Research paper

Body attitude, body satisfaction and body awareness in a clinical group of depressed patients: An observational study on the associations with depression severity and the influence of treatment

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ABSTRACT

Background: Apart from changes in mood and cognition, depressive disorders are also characterized by changes in body experience, changes that largely influence daily functioning and aggravate distress. In order to gain more insight into this important issue, three domains of body experience - body attitude, body satisfaction and body awareness - and their associations with symptom severity of depression were studied pre- and post-treatment in a clinical sample of depressed patients in a multidisciplinary setting.

Methods: Body attitude (Dresden Body Image Questionnaire), body satisfaction (Body Cathexis Scale), body awareness (Somatic Awareness Questionnaire) and severity of depressive symptoms (Inventory of Depressive Symptomatology) were measured. Differences between pre-treatment and post-treatment scores were studied with paired *t*-tests. Associations between body experience and depression were analysed with Pearson correlations and partial correlations.

Results: At the start of treatment, patients scored significantly lower than a healthy comparison sample on body attitude and body satisfaction, but not on body awareness. After treatment, depression scores decreased with large effect sizes, scores for body attitude and body satisfaction increased with medium effect sizes and body awareness scores increased slightly. Medium pre-treatment and strong post-treatment associations were found between depression severity and body attitude and between depression severity and body satisfaction.

Limitations: The design does not allow to draw causal conclusions. Because of the multidisciplinary treatment no information is available on the specific contribution of interventions targeting body experience.

Conclusions: The study provides evidence for medium to strong associations in clinically depressed patients between body attitude, body satisfaction and depression.

1. Introduction

Depressed patients frequently report a broad range of body-related symptoms and phenomena such as decreased feelings of vitality; negative appraisal of the body, loss of sexual interest; and physical complaints like chronic joint pain, limb pain, back pain and gastrointestinal problems (Trivedi, 2004). Furthermore, studies have shown a positive association between depression and psychomotor retardation (Bennabi et al., 2013; Lecrubier, 2006) as expressed in, among others, decreased

gait, restricted sensorimotor space (Fuchs and Schlimme, 2009; Michalak et al., 2009) and increased standing phases and slumped posture with reduced vertical movement of the upper body (Wendorff et al., 2002). In line with these findings Doerr-Zegers et al., (2017) propose to characterize depressive disorders not only by the changes in mood and cognition, but also by changes in the subjective experience of one's own body, as these changes largely influence daily functioning and aggravate distress.

As described by Bhugra and Mastrogianni (2004), body-related

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symptoms are common features of depression throughout the world. Röhrich et al., (2013) and Papadopoulos and Röhrich (2014), suggest that the way depressed people experience their body is a core feature of depression, and used this as a frame of reference in body-oriented psychological interventions for depression. However, despite these observations, most theoretical models for processes underlying depression do not explicitly or systematically refer to the body-mind nature of depressive syndromes and empirical evidence for the general association between subjective body experience and depressive symptoms is scarce.

Studies have typically been conducted in non-clinical samples (Gillen, 2015; Jackson et al., 2014; Kim and Kang, 2015; Marsella et al., 1981; Noles et al., 1985), revealing consistent results: respondents scoring in the clinical range of depression display significantly higher body dissatisfaction than non-depressed controls. Furthermore, Rosenström et al., (2013), using data from a population-based longitudinal study, found that the appearance-related item from the Beck Depression Inventory (Beck and Steer, 1993) ‘I fear that I look ugly and displeasing’ was a strong predictor for chronic depression characterized by dysphoria. In one of the rare studies that have been conducted in a clinical sample of depressed patients ($n = 40$), Röhrich et al., (2002) reported that body satisfaction improved as depressive symptoms decreased.

In the studies presented thus far, assessment of body experience has been mainly restricted to appearance-related and weight-related body dissatisfaction. Considering the diverse aspects of body experience that are affected in depression, a conceptually broader representation of body experience is warranted. Consequently, it is important to not only measure body dissatisfaction, but also the overall attitude towards the body (Scheffers et al., 2017a), as well as body awareness.

The role of body awareness in depression has recently received more attention. Danielsson and Rosberg (2015), for example, emphasized the importance of addressing and enhancing body awareness in treating persons with major depression. Based on emerging evidence for abnormalities of interoception and dysfunction in the neural substrates for interoception (e.g., vagus, insula, anterior cingulate cortex) in depression, Harshaw (2015) hypothesised that the reduced perception and interpretation of bodily signals is a key symptom of depressive disorder. In the present study body awareness is defined conform the description by Mehling et al. as “the perception of bodily states, processes and actions that is presumed to originate from sensory proprioceptive and interoceptive afferents and that an individual has the capacity to be aware of”.

The central aim of the present study is to further our understanding of the relation between body experience and clinical depression and to fill the gap in research on body experience in clinical samples and possibly validate the role of body- and movement-oriented interventions targeting body experience in depression treatment. In line with the concept of body experience as capturing a variety of body-related phenomena such as feelings and beliefs about the body, the evaluation and awareness of the body, and body related behaviour (Cash, 2004; Röhrich et al., 2005; Joraschky et al., 2009) we distinguish three domains of body experience. Next to *body satisfaction*, indicating the degree of contentment with appearance or functionality of the body (Orlandi et al., 2006); and *body awareness*, as defined above (Mehling et al., 2009), *body attitude*, referring to cognitive, affective and behavioural aspects (Scheffers et al., 2017a), is studied.

The present study investigates the relation between these three domains of body experience and symptom severity in a group of depressed patients at the start and end of multidisciplinary treatment programme consisting of pharmaceutical, psychotherapeutic, and body- and movement-oriented interventions. We also evaluated gender differences, because of the difference in prevalence of depression between women and men (Grigoriadis and Robinson, 2007; Piccinelli and Wilkinson, 2000) and because of the gender-specific role body experience, especially body satisfaction, may play in depression (Kearney-

Cooke, 1998; Paxton et al., 2006).

2. Methods

2.1. Participants

The study was performed at the Department of Mood and Anxiety Disorders, University Center for Psychiatry (UCP), University Medical Center Groningen (UMCG), a tertiary academic centre. During a period of 18 months all patients starting the three months inpatient treatment or day treatment, both combining pharmacotherapeutic, (cognitive behavioural) psychotherapeutic and body- and movement-oriented interventions (psychomotor therapy) (Vermeer et al., 1997) were asked to participate in the study. Inclusion criteria for the treatment programme were (1) the presence of a diagnosis of Major Depression Disorder (MDD) as the primary disorder according to the Diagnostic and Statistical Manual of Mental Disorders criteria (DSM-IV-TR, APA 2000) established by psychiatrists or clinical psychologists by conducting extensive clinical interviews and by critically evaluating biography and treatment history (2) indicated for intensive multidisciplinary inpatient or day treatment because of a chronic ($> two$ years) duration of depressive symptoms or recurring depressive periods. Exclusion criteria for treatment were (1) a diagnosis of addiction, bipolar disorder, or psychosis, and (2) a crisis situation requiring immediate attention (e.g., high suicidality); and (3) patient is not available for inpatient or day treatment or does not wish to join the programme. In- and exclusion criteria for the study paralleled those for treatment with the addition that patients who at the start of the study did not fulfil the criteria for depression based on the cut-off scores (Schulte-van Maaren et al., 2013) of the Inventory of Depressive Symptomatology (IDS, Karsten et al., 2010; Rush et al., 1996) were excluded.

Of the 98 patients starting treatment at the time of data collection (59 women, 39 men), 10 were not included in the study because they did not fulfil the IDS criteria for depression ($n = 10$). Fourteen patients were not included because they did not fill out the IDS ($n = 12$) or the DBIQ ($n = 2$) at the start of treatment. Thus, at the start of treatment the sample consisted of 44 women (mean age 41.9, SD 12.0, range 21–61) and 30 men (mean age 45.2, SD 12.2, range 23–60). For 25 respondents no post-treatment IDS scores were available and from one other patient no information on the DBIQ was available at the end of treatment, leading to the inclusion of 48 patients (29 women, 19 men) in the pre-post analyses.

2.2. Measures

2.2.1. Inventory of depressive symptomatology

The Inventory of Depressive Symptomatology-Self Report (IDS-SR, Karsten et al., 2010; Rush et al., 1996) is a self-report instrument designed to measure overall depressive symptom severity. The IDS score, which ranges from 0 to 84, was obtained from 28 equally weighed items, rated on a 4-point Likert scale (range 0–3).

2.2.2. Dresden body image questionnaire

The Dresden Body Image Questionnaire (DBIQ, Pöhlmann et al., 2008; 2014) is a 35-item questionnaire with positively and negatively worded statements across five subscales: body acceptance (e.g., “I wish I had a different body”), vitality (e.g., “I am physically fit”), physical contact (e.g., “Physical contact is important for me to express closeness”), sexual fulfilment (e.g., “I am very satisfied with my sexual experiences”) and self-aggrandizement (e.g., “I use my body to attract attention”). Level of agreement with items was scored on a 5-point Likert scale ranging from 1 = not at all to 5 = fully. A higher score indicates a more positive body attitude. Psychometric evaluation of the Dutch version of the DBIQ resulted in a slight adaptation of the original scale, by moving one item to a different subscale. The resulting scales and subscales showed good reliability and validity (Scheffers et al., 2017c).

2.2.3. Body cathexis scale

The Body cathexis scale (BCS) is a 40-item self-report measure that focuses on body satisfaction (Dorhout et al., 2015; Secord and Jourard, 1953). The items relate to satisfaction with the body or to bodily functions, for instance: *hands, vitality, eyes, coordination, health and weight*. Responses were scored on a 5-point Likert scale, ranging from 1 = very dissatisfied to 5 = very satisfied. In a study on the BCS in a non-clinical sample, validity and reliability were found to be sufficient (Dorhout et al., 2015).

2.2.4. Somatic awareness questionnaire

The Somatic Awareness Questionnaire (SAQ, Gijsbers van Wijk and Kolk, 1996) is a Dutch 25-item self-report questionnaire that assesses sensitivity to and awareness of internal bodily signals and states, like energy level and awareness of tiredness. All items were posed as statements addressing awareness of internal bodily processes. Items were scored on a 5-point Likert scale (1 = not at all, 2 = barely, 3 = more or less, 4 = somewhat, 5 = much). A higher score indicates more awareness of bodily signals. In a non-clinical sample, validity and reliability were found to be sufficient (Burger and Gianotten, 2011).

2.3. Procedure

All patients starting treatment in the regular three months multidisciplinary treatment programme were asked to fill out the DBIQ-35, BCS and SAQ in the week before start of treatment. They received an envelope containing the questionnaires addressing body experience to be filled out paper and pencil on-site. This procedure was repeated in the week following end of the treatment.

As part of the computer-administered Routine Outcome Monitoring, IDS was monitored every two weeks during treatment. IDS measurements closest to those of the body experience scales measurements were used.

2.4. Data analyses

All data analyses were conducted using IBM SPSS Statistics software version 20. In calculating means for IDS and body experience measures we limited missing values to two for total mean scores. This led to no loss of data for IDS, SAQ and BCS. However, DBIQ data showed more than two missing values in ten respondents, mainly as a result of missing values in the subscale sexual fulfilment. Therefore, we decided not to include the subscale sexual fulfilment in our analysis. DBIQ mean item scores showed no significant differences with and without this subscale (Mean = 2.60, SD = 0.49 and Mean = 2.58, SD = 0.48, respectively). For IDS, cut-off scores provided by Schulte-van Maaren et al. (2013) were used: IDS < 22 for women aged 18–40, 24 for women aged 41–65, 17 for men aged 18–40 and 19 for men aged 41–65.

Differences between body experience and depression scores between patients with complete and incomplete data were investigated with *t*-tests. Differences between pre-treatment and post-treatment scores were studied using a paired *t*-test and were expressed in Cohen's *d*, which is considered large if *d* > 0.80, moderate if *d* is between 0.50 and 0.79 and small when *d* is between 0.20 and 0.49 (Cohen, 1992).

Associations between domains of body experience and depression at the start and end of treatment were analysed by Pearson correlations with separate analyses for men and women. Moreover, in order to obtain an estimate of the remaining association between body experience measures and depression after treatment, partial Pearson correlations were computed for the post-treatment scores on body experience measures and depression, controlling for pre-treatment measures. At post treatment, we also distinguished between patients who were in remission at the end of treatment and those who were not.

Table 1

Means, standard deviations and gender differences for depression and body experience at pre-treatment (*n* = 74; *n*_m = 30; *n*_f = 44).

	Mean	SD	Mean _m	SD _m	Mean _f	SD _f	<i>t</i>	<i>d</i>
IDS	39.2	9.3	36.1	9.2	41.3	8.9	2.45*	0.57
DBIQ	2.60	0.49	2.84	0.46	2.44	0.45	3.67**	0.88
BCS	2.98	0.42	3.17	0.31	2.84	0.44	3.54**	0.87
SAQ	3.08	0.56	2.91	0.45	3.19	0.60	2.18*	0.53

m = male, *f* = female; *d* = Cohen's *d*; IDS = Inventory of Depressive Symptomatology; DBIQ = Dresden Body Image Questionnaire; BCS = Body Cathexis Scale; SAQ = Somatic Awareness Questionnaire.

* *p* < .05

** *p* < .001

3. Results

Pre-treatment scores on IDS for respondents without post-treatment scores did not differ significantly from those of respondents with both pre-treatment and post-treatment scores: Mean = 39.2, SD = 9.6 and Mean = 39.2, SD = 9.3, respectively; *t*(72) = 0.02, *p* = .99. Differences in body experience measures between respondents without post-treatment IDS scores and those with both pre-treatment and post-treatment IDS scores were significant for BCS: *t*(72) = 2.00, *p* = .05, *d* = 0.49, with respectively Mean = 2.84, SD = 0.38 and Mean = 3.04, SD = 0.43; and for SAQ: *t*(72) = 2.08, *p* = .04, *d* = 0.51 with respectively Mean = 3.26, SD = 0.53 and Mean = 2.98, SD = 0.56. Differences were non-significant for DBIQ: *t*(72) = 0.85, *p* = .40.

Table 1 shows means, standard deviations and gender differences for IDS and the three body experience measures at pre-treatment. The effect size for gender differences in depression severity was moderate, with women presenting higher depression scores than men. Effect sizes for gender differences on DBIQ and BCS were large (> 0.80), with women scoring lower than men. Women did, however, score higher than men on body awareness, with a moderate effect size.

Table 2 presents correlations between the three dimensions of body experience and depression severity at pre-treatment for the whole group and for men and women separately. The correlations of DBIQ and BCS with IDS are weak to moderate, and the correlations of SAQ with IDS as well as with the other body experience measures are very weak. The correlations are represented graphically in the left panel of Fig. 1 and in Figs. S2 and S3 in the supplementary materials. Table S1 in the supplementary materials presents correlations for the sample of respondents with complete data at both pre- and post-treatment (*n* = 48) in order to facilitate valid comparison with the post-treatment correlations. Except for a stronger negative correlation between IDS and BCS for women in the sample with complete data, there are no substantial differences between Table 2 and Table S1.

Table 3 shows differences before and after three months of

Table 2

Correlations at pre-treatment for total group and men and women separately (*n* = 74; *n*_m = 30; *n*_f = 44).

	IDS	DBIQ	BCS	SAQ
IDS				
DBIQ	−0.38*/−0.30*	−0.41**	−0.24*	0.05
BCS	−0.28/−0.09	.33/0.41**	0.47**	−0.14
SAQ	0.03/0.05	−0.23/0.06	0.3/−0.08	−0.14

m = male, *f* = female; *d* = Cohen's *d*;

Correlations within whole group above and of m/f separately below diagonal; IDS = Inventory of Depressive Symptomatology;

DBIQ = Dresden Body Image Questionnaire;

BCS = Body Cathexis Scale; SAQ = Somatic Awareness Questionnaire.

* *p* < .05

** *p* < .01

Fig. 1. Correlation scatterplots of the depression measure IDS and body experience measure DBIQ before and after treatment and partial correlation plot after treatment controlling for pre-treatment measures ($n = 48$).

Table 3

Means and standard deviations on depression and body experience before and after treatment, paired t -test and Cohen's d and correlation pre-post ($n = 48$; $n_f = 29$, $n_m = 19$).

	Pre-treatment	Post-treatment	t	Cohen's d	Correlation pre post
(sub) scale	M (SD)	M (SD)			
IDS total group	39.2 (9.4)	21.7 (15.3)	−9.16*	1.38	0.51
m	37.6 (9.7)	17.5 (14.1)	−7.71*	1.66	0.68
f	40.5 (9.1)	24.6 (15.0)	−5.98*	1.28	0.36
IR	36.2 (9.1)	10.3 (5.4)	−12.90*	3.47	0.02
NIR	43.1 (8.6)	36.3 (10.6)	−4.21*	0.70	0.73
DBIQ	2.64 (0.51)	2.96 (0.56)	5.46*	0.60	0.72
m	2.87 (0.48)	3.24 (0.45)	3.48*	0.80	0.51
f	2.49 (0.47)	2.78 (0.55)	4.18*	0.57	0.75
IR	2.70 (0.46)	3.22 (0.45)	7.67*	1.15	0.70
NIR	2.57 (0.56)	2.62 (0.50)	0.79	0.09	0.86
BCS	3.04 (0.44)	3.33 (0.55)	5.34*	0.58	0.72
m	3.24 (0.33)	3.55 (0.43)	3.21*	0.81	0.39
f	2.91 (0.45)	3.19 (0.57)	4.24*	0.55	0.78
IR	3.09 (0.48)	3.55 (0.47)	6.98*	0.97	0.74
NIR	2.97 (0.38)	3.06 (0.53)	1.19	0.20	0.77
SAQ	2.98 (0.56)	3.10 (0.61)	1.93	0.20	0.75
m	2.88 (0.52)	2.97 (0.47)	0.99	0.18	0.71
f	3.04 (0.59)	3.18 (0.68)	1.64	0.22	0.76
IR	2.93 (0.50)	3.16 (0.60)	2.74**	0.42	0.70
NIR	3.04 (0.64)	3.01 (0.63)	−0.39	0.05	0.85

m = male, f = female; IR = in remission ($n = 27$); NIR = not in remission post-treatment ($n = 21$).

IDS = Inventory of Depressive Symptomatology; DBIQ = Dresdner Body Image Questionnaire;

BCS = Body Cathexis Scale; SAQ = Somatic Awareness Questionnaire.

* $p < .001$

** $p < .05$

treatment. Note that the pre-treatment means refer to the 48 participants with post-treatment scores. The differences with the pre-treatment means for all patients reported in Table 1 are small.

The effect size for change in IDS scores is high and somewhat higher for men than for women. The effect sizes for body attitude (DBIQ) and body satisfaction (BCS) are moderate for the complete group and for women, but high for men. Effect sizes for differences in scores on body awareness (SAQ) before and after treatment are low for both women and men. Patients who score below the cut off values on the IDS after treatment, indicating remission, show high effect sizes for DBIQ and BCS, whereas these effect sizes are low for those not in remission. The

Table 4

Correlations between depression severity and body experience measures ($n = 48$) at post-treatment and partial correlations at post-treatment controlling for pre-treatment measurements.

	DBIQ	BCS Correlations	SAQ
IDS	−0.61**	−0.61**	−0.15
m/f	−0.48*/−0.65**	−0.52*/−0.62**	−0.05/−0.27
IR/NIR	−0.15/−0.50*	−0.18/−0.70**	0.14/0.24
Partial correlations			
IDS	−0.70***	−0.54***	−0.10
m/f	−0.56*/−0.71***	−0.37/−0.63***	0.36/−0.32
IR/NIR	−0.26/−0.56*	−0.01/−0.27	0.25/0.37

m/f = male/female; IR/NIR = in remission/not in remission; IDS = Inventory of Depressive Symptomatology; DBIQ = Dresdner Body Image Questionnaire; BCS = Body Cathexis Scale; SAQ = Somatic Awareness Questionnaire.

* $p < .05$

** $p < .01$

*** $p < .001$

boxplots in Fig. S1 in the supplementary materials illustrate the differences between pre-treatment and post-treatment for men and women, and for patients in remission and not in remission.

Table 4 shows correlations at post-treatment for IDS and for the three body experience measures as well as the partial correlations controlled for pre-treatment. Fig. 1 facilitates interpretation for DBIQ, and Figs. S2 and S3 facilitate interpretation for BCS and SAQ. These Figures all present scatterplots with a regression line of the pre- and post-treatment measurements and a scatter plot showing the partial correlations for the complete sample. The partial correlation plots are based on the residuals for the post-treatment depression score after regression on the pre-treatment score for depression and the body experience measure.

In the pre-treatment scatterplot in Fig. 1, the regression line of IDS score on DBIQ score is less steep than in the post-treatment scatterplot. This reflects a lower association pre-treatment, which is at least partly due to the smaller range in both IDS and DBIQ scores compared to the post-treatment scatterplot. After controlling for the pre-treatment scores, the association post-treatment becomes even somewhat stronger, which is reflected by the variability around the regression line in the partial correlation plot.

In the post-treatment correlation plots, the separate groups of

patients in remission and not in remission are visually clear. Because of the low IDS scores for patients in remission, the correlations with DBIQ, BCS and SAQ in this group are weak. As reflected by the weak partial correlations, correlations remain weak after correcting for the pre-treatment measures. Gender differences in correlations and partial correlations are modest. The higher negative partial correlation between IDS and BCS for women is likely due to the outlier in the lower right corner (third panel of Fig. 1). Overall, the correlations and partial correlations are strongest for IDS and DBIQ, increasing from pre- to post-measurement, and similar, but not quite as strong, for BCS. The correlation between SAQ and IDS, on the other hand, is quite weak. These results are in line with the similar distributions of DBIQ and BCS at pre- and post-treatment and of their difference score.

4. Discussion

The aim of this study was to investigate associations between depression and different domains of body experience in a group of clinically depressed patients. The study shows a simultaneous improvement of depression, body attitude and body satisfaction. Furthermore, medium to strong associations between depression severity and body attitude and between depression severity and body satisfaction were found before and after treatment, and when controlling for covariates.

Body awareness scores did not change significantly in the course of treatment and showed low correlations with depression severity at the start as well as at the end of treatment. These findings were contrary to our expectations. Therefore, we will address body awareness separately in our discussion.

4.1. Depression severity, body attitude and body satisfaction

Compared with respondents in a healthy comparison sample who filled out the same questionnaires on body experience (Scheffers et al., 2017c), patients with depression scored significantly lower at the start of treatment. On a 5-point range, the difference was almost one point lower on body attitude and more than half a point lower on body satisfaction. Overall, depression scores decreased as a result of treatment with high effect sizes. Simultaneously, body attitude as well as body satisfaction scores increased with medium effect sizes. Furthermore, patients who achieved remission at the end of the treatment period also showed large changes in body attitude and body satisfaction, whereas patients not in remission only showed small changes on these domains. After treatment, mean scores on body attitude and body satisfaction were still below those reported for healthy controls (Scheffers et al., 2017c), although only slightly so for patients in remission. Together with the finding of large post-treatment partial correlations (i.e. controlling for pre-treatment scores) between depression scores and body attitude as well as body satisfaction scores, the results point in the direction of an interesting connection between these aspects of body experience and depression severity.

4.2. Gender differences

In line with the sex-specific pattern in IDS reference values reported by van Schulte-van Maaren et al. (2013), mean scores for women on IDS in our study were somewhat higher than those for men. At the start of treatment, mean scores on body attitude and body satisfaction were lower for women than for men. These results are similar to those in a healthy convenience sample in which the same body experience measures were used (Dorhout et al., 2015; Scheffers et al., 2017c), to studies on body attitude in a broad range of mental disorders (Scheffers et al., 2017b), and to studies on body attitude and body satisfaction in a group with trauma-related disorders (Scheffers et al., 2017a). Although body attitude, body satisfaction and depression scores improved for both women and men, the differences before and after treatment were larger for men than for women. Post-treatment women showed higher

depression severity and more negative body attitude and body satisfaction scores than men.

4.3. Depression and body awareness

The results of our study do not support the hypothesis by Harshaw (2015) that diminished interoceptive awareness or body awareness is central in depression. Compared with scores in the healthy sample (Burger and Gianotten, 2011), body awareness in depressed patients was hardly lower at the start of treatment, although somewhat lower for men than for women, and changed only slightly after treatment.

The SAQ measures core aspects of interoceptive awareness and was therefore our instrument of choice. Mehling et al., (2012), however, proposed to broaden the conceptualization of interoceptive awareness as commonly used in neuroscience to one that includes interpretational aspects of perception, such as appraisal and beliefs (e.g., catastrophizing) and attention regulation (e.g. ignoring, distraction). They stated that the concept of body awareness is too strict and should also include proprioceptive awareness, the conscious perception of joint angles and muscle tensions, of movement, posture and balance (Laskowski, 2000). Therefore, they introduced the Multidimensional Assessment of Interoceptive Awareness (MAIA). This broader instrument might be more informative than the SAQ in assessing the association between body awareness and depression and might shed light on the possibility that not body awareness ‘as such’ is disturbed, but that ignoring and avoiding the awareness of bodily signals might be central in body awareness in depression.

4.4. General discussion

Notwithstanding a modest sample of patients diagnosed with depression, our study showed medium to large improvement and clear associations between depression and body experience scores pre- and post-treatment. As no large differences due to attrition were found, the findings of the current study can be considered solid and generalisable to a broader population of clinically depressed patients.

The diverging outcomes of the current study for the different domains of body experience support our view that body experience needs to be measured from different angles (Scheffers et al., 2017a). Aspects of body experience appear to be affected differently in depression, and treatment may influence these aspects in different ways. The majority of studies that have investigated the association between body experience and depression, for the most part conducted in non-clinical samples, only focused on the aspect of body dissatisfaction and its association with depression. Our findings of reduced body satisfaction in a clinical sample of depressed patients are in line with the result of these studies.

Our study also clearly shows the association of body attitude with depression, which so far has not been a topic in depression research. It seems worthwhile to pay more attention to measures of body attitude capturing body-related emotional and behavioural aspects, which are important features in the subjective experience of depression.

4.5. Limitations

Our results have to be interpreted considering several limitations. First, our design does not permit causal interpretations regarding the relationship between body image disturbance and depression severity. Second, the results on changes in symptom severity and changes in body experience are all based on self-report. However, in a study with 544 out-patients with major depressive disorder (MDD) and 402 out-patients with bipolar disorder (BD) Trivedi et al., (2004) found the clinician based IDS-C to be equivalently sensitive to symptom change to the IDS-SR we used, indicating high concurrent validity for both scales in a population resembling our study sample. Also, a clinical relevant

baseline of severity of symptoms in our group was established by only including patients with an Axis 1 DSM-IV diagnosis for depression and excluding patients not fulfilling the criteria for depression based on the cut-off scores provided by Schulte-van Maaren et al. (2013).

Third, some overlap may exist between the BCS, measuring body cathexis and the DBIQ, measuring body attitude (Scheffers et al., 2017c). However, in the BCS appearance-related issues are prominent whereas the DBIQ items aim to measure a more general aspect of body acceptance as part of the attitude towards one's own body. Fourth, although our study provided more insight into the aspects of body experience that are disturbed in depressed patients and might be targeted in therapy, the integrated specialized multidisciplinary treatment programme does not make it possible to distinguish the specific benefits of the body- and movement-oriented intervention (psychomotor therapy) from the pharmacotherapeutic and psychotherapeutic treatment. Pharmacotherapy may also have had impact on body experience, which was not taken into account. The influence of physical comorbidity also remained unmeasured in our study, but is of potential interest.

One of the few studies that investigated whether a body-oriented psychological therapy is specifically effective in improving depressive symptoms was conducted by Röhrich et al. (2013). In an exploratory randomized control the authors found that, at the end of treatment, patients in the body psychotherapy group had significantly lower depressive symptom scores than the waiting group that served as comparison group. However, no measures of body experience were used.

Some additional support for the use of body- and movement-oriented approaches as an adjunctive treatment for depression comes from reviews indicating that the use of relaxation techniques and exercise may alleviate depression severity (D' Silva et al., 2012; Luberto et al., 2013). These reviews do not specify the role and influence of body experience, but it may be suggested that part of the working mechanism lies in the self-empowering effect of experiential therapies such as psychomotor therapy (D' Silva et al., 2012).

4.6. Conclusions

The study findings indicate that in clinically depressed patients, body experience, especially body attitude and body satisfaction, improves after treatment, with strong associations between depressive symptoms and body attitude and body satisfaction. This result merits further controlled studies investigating both depression symptoms and body experience measures in order to evaluate and elucidate the specific role of body- and movement-oriented interventions in depressed patients. These studies may lead to the development of further specialized interventions.

Declarations of interest

none.

Contributors

All persons who met authorship criteria are listed as authors. All authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript. Furthermore, each author certifies that this material or similar material has not been and will not be submitted to or published in any other publication.

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Supplementary materials

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