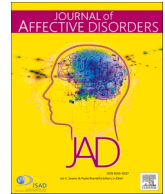




Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

Deconstructing recovery: A prospective study on well-being, symptom severity and acceptance in patients with major depressive disorders

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ARTICLE INFO

KEYWORDS:

Well-being
Depression
Mental health continuum-short form
Social participation
Acceptance
Identification

ABSTRACT

Background: Perceived well-being is key in the recovery from major depressive disorder (MDD). It is however unclear how well-being relates to other aspects of recovery, like depressive symptom severity, acceptance, disease identification and social participation. In patients with MDD we investigated 1) changes in these five concepts over time, 2) which concepts associate with well-being, and 3) whether a relationship between depressive symptoms and well-being is moderated by acceptance, disease identification and social participation. **Methods:** Adult outpatients with MDD ($n=77$) were administered the Mental Health Continuum-Short Form, the Inventory of Depressive Symptomatology, the Acceptance and Action Questionnaire-II, the Pictorial Representation of Illness and Self Measure, and the Scale Functional Remission before treatment and six months later. Changes over time were tested using paired samples t-tests, associations between concepts were tested with correlations. Regression analyses were used to test moderation effects.

Results: Participants improved on all outcome measures. Well-being correlated moderately with depressive symptom severity (negative correlation) and acceptance at baseline, and strongly at follow-up. At follow-up well-being also correlated moderately with disease identification and social participation. No evidence for moderation was found.

Limitations: Recruitment in one regional mental health center might limit generalizability. Furthermore, confounding effects of psychiatric comorbidity on recovery and well-being cannot be ruled out.

Conclusion: Recovery in patients with MDD is associated with improvement on multiple outcome domains. Symptom severity and acceptance showed the strongest association with perceived well-being. Future studies should explore whether treatments targeting symptom severity and acceptance have the strongest impact on recovery.

1. Introduction and objective

Major depressive disorder (MDD) is the most common psychiatric disorder worldwide, with a great burden for patients and their families (Collaborators, 2017). In The Netherlands, MDD has a life time prevalence of about 18% (Kessler and Bromet, 2013a, 2013b). Besides the emotional burden, the large economic impact is driven by the high prevalence and debilitating nature of the illness (Greenberg et al., 2015).

Psychiatry has traditionally focused on elucidating the causes of mental illnesses and developing treatments aiming to reduce mental health suffering and disability. Many evidence-based therapies for MDD are available, including pharmacotherapy, and several psychotherapies like cognitive behavioral therapy, acceptance and commitment therapy, and mindfulness-based cognitive behavior therapy (Cuijpers et al., 2020). Although these therapies have been proven effective, 10 to 49% of patients relapse after treatment (Paykel, 2007; Wojnarowski et al.,

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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¹ The study was performed at the GGZ Oost Brabant, Department Anxiety and Depression, The Netherlands.

<https://doi.org/10.1016/j.jad.2021.09.048>

Received 1 March 2021; Received in revised form 12 September 2021; Accepted 14 September 2021

Available online 20 September 2021

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2019).

In clinical studies, treatment effectiveness is mostly defined by reductions in symptom severity, with response commonly defined as a 50% symptom reduction, for instance on a Hamilton Depression Rating Scale, and remission as the absence of a depressive disorder according to DSM-5 criteria (Cuijpers et al., 2019a, 2019b, 2019c). However, there is increasing interest for a broader definition of recovery, which besides symptoms focusses on well-being (Fava and Guidi, 2020; Hasler et al., 2004). Indeed, the World Health Organization defines mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (Galdner et al., 2015). Accordingly, mental health is not merely an absence of mental illness, but reflects the presence of a positive psychological state of well-being, encompassing life satisfaction, positive emotions, and good functioning in one’s individual endeavours and social life. Historically, well-being has been viewed as a hedonic concept, focusing on, for instance, happiness, positive affect, and life satisfaction (Bradburn, 1969; Diener, 1984) or a eudaimonic concept, referring to optimal functioning in one’s individual endeavours and social life (Rogers, 1961; Ryff, 1989). Nowadays, well-being is commonly recognized as a multidimensional construct (Diener, 2009), encompassing emotional, psychological, and social well-being, thus, combining the hedonic and eudaimonic traditions (Gallagher et al., 2009). Interestingly, this new, broader definition of recovery encompassing a focus on well-being beside a symptom focus, is more in line with patients’ perspectives on recovery, knowing that patients with MDD often define their recovery rather as restoring self-confidence and role-fulfillment, and not only as the decrease of depressive symptoms (Cuijpers, 2020; Zimmerman et al., 2006).

Several studies, mostly in community samples, have explored the relationship between well-being and symptom severity as measures of recovery suggesting that well-being and symptom severity are negatively related, but are potentially different dimensions of mental health, also called the two continua model (Franken et al., 2018; Keyes et al., 2008; Lamers et al., 2011; van Erp Taalman Kip and Hutschemaekers, 2018).

An important question is which factors are related to well-being, besides symptom severity. Previous studies have identified acceptance of depressive symptoms, identification with the depressive disorder and social participation as important determinants of recovery in patients with MDD (Bond and Bunce, 2003; Breton et al., 2015; Büchi et al., 2002; Kelly et al., 2007; Schotanus-Dijkstra et al., 2016; Wittmann et al., 2012; Wood and Joseph, 2010). Studies on acceptance of the mental illness demonstrated that targeting acceptance by offering Acceptance and Commitment Therapy to patients with depressive disorders resulted in decreased depressive symptoms (Brown et al., 2016; Fledderus et al., 2013; Hayes et al., 2004; Jacobs et al., 2008; Windle et al., 2011), though prospective studies linking acceptance to well-being are lacking. Evidence for a role of identification with disorder severity mainly comes from studies in patients with post-traumatic stress disorder (PTSD), showing that the extent of identification with the trauma correlated strongly with the degree of psychiatric symptoms (Wittmann et al., 2012). Research on changes in identification with the disorder during recovery and its relationship with well-being is largely lacking, particularly in patients with MDD. Finally, social participation is often mentioned as an important factor in the recovery process. However, findings about the relationship between participation and recovery are inconclusive. One meta-analysis showed moderate associations between improvements in social functioning and symptom severity in patients with depressive disorders (Hudson et al., 2016), though another meta-analysis did not find such a relationship (Park et al., 2014). Prospective studies on the association between social participation and well-being in MDD patients is therefore needed.

Taken together, well-being is considered a key element in personal recovery alongside symptom reduction in MDD patients. However, it is

currently unknown which psychological mechanisms contribute to well-being. The aim of the current study was to investigate the relationship of well-being with depressive symptoms, acceptance, identification, and social participation during treatment of patients with MDD. Specifically, the following were investigated 1) the change in all five concepts during treatment, 2) the relationship of well-being to depressive symptoms, acceptance, identification, and social participation at baseline and after six months of treatment, and 3) whether acceptance, identification and social participation moderated the relationship between depressive symptoms and well-being at baseline and after six months.

2. Methods

2.1. Design

An observational cohort study was used based on Routine Outcome Monitoring data (collected as part of standard treatment evaluation). Participants provided written informed consent. The study protocol was approved by the regional ethical board (Faculty of Behavioral Sciences Ethics Committee at the University of Twente in the Netherlands).

2.2. Participants

A consecutive series of outpatients with MDD who applied for a six-month treatment for MDD were recruited at a regional mental health care facility (GGZ Oost Brabant, The Netherlands). Inclusion criteria were the presence of MDD (based on the MINI-Neuropsychiatric Interview), age 18 to 65 years, good understanding of the Dutch language and informed consent. Patients with psychosis were excluded.

Of the 125 approached patients, 77 were included in the study. Of the 48 patients that did not participate 12 refused because they considered themselves too depressed to fill out questionnaires, 24 refused without a reason, five patients were excluded due to difficulties with the Dutch language, three had a treatment-focus other than MDD and four were referred to another mental health care organization.

2.3. Measurements

2.3.1. Demographic information

Demographic information was collected during the intake interview, including level of education, daily activities such as work or study, marital status and history of previous depressive episodes.

2.3.2. Well-being

Well-being was measured by the Dutch version of the Mental Health Continuum-Short Form (MHC-SF) (Keyes et al., 2008; Lamers et al., 2011). Several instruments have been developed to assess well-being, most of which are rather long or measure only one or a few dimensions of well-being. The 14-item Mental Health Continuum-Short Form (MHC-SF) is a relatively brief questionnaire based on the 40-item Mental Health Continuum (Keyes, 2002). It addresses emotional (3 items), psychological (6 items), and social dimensions (5 items) of well-being (Keyes, 2005). Respondents rate the frequency of every feeling in the past month on a 6-point Likert scale from 0 (‘never’) to 5 (‘every day’). A higher average score (0 to 5) indicates a higher level of well-being (Lamers et al., 2011). The MHC-SF has been shown to have good psychometric properties in adults within various cultural contexts across the world, including in the Dutch population (Franken et al., 2018; Lamers et al., 2011, 2012, 2010) with a high internal reliability for the total score ($\alpha=0.89$), as well as for the subscales of emotional well-being ($\alpha=0.83$) and psychological well-being ($\alpha=0.83$), and adequate reliability for the subscale social well-being ($\alpha=0.74$). The internal consistency for the total scale of the MHC-SF in the study of Franken et al. (2018) was high ($\alpha = .92$), as well as for the subscales emotional well-being ($\alpha = 0.88$) and psychological well-being ($\alpha = .85$). For social well-being, the internal consistency was acceptable ($\alpha =$

.77).

2.3.3. Depressive symptom severity

Depressive symptom severity was measured with the 30-item Inventory of Depressive Symptomatology Self-Report (IDS-SR) (Rush et al., 1996; Trivedi et al., 2004). The IDS-SR was designed to assess the severity of depressive symptoms in line with the American Psychiatry Association Diagnostic and Statistical Manual of Mental Disorders 5th edition (2003). The items of the IDS-SR are scored using a four-point Likert scale ranging from 0 to 3. The IDS-SR is sensitive to change, with pharmacotherapy and psychotherapy, making it useful for both research and clinical purposes. The psychometric properties of the IDS-SR have been established in various samples. Internal consistency was high for the IDS-SR (Cronbach's $\alpha = 0.86$ to 0.94 (Rush et al., 2003; Trivedi et al., 2004).

2.3.4. Acceptance of psychiatric symptoms

The Acceptance and Action Questionnaire-II (AAQ-II) was administered to measure acceptance of psychiatric symptoms. The instrument was developed by (Jacobs et al., 2008), based on the original AAQ (Bond and Bunce, 2003) and AAQ I (Hayes et al., 2004). The AAQ-II consists of 10 items, scored on a 7-point Likert scale from 1 ('never true') to 7 ('always true'). The total score is calculated by adding up the item scores. For the items 2, 3, 4, 5, 7, 8 and 9, the scores were reversed. The higher the total score, the higher the level of acceptance of the symptoms and the less experiential avoidance. Construct validity, internal consistency ($\alpha = .89$), convergent and divergent validity were good.

2.3.5. Identification with the disorder

The Pictorial Representation of Illness and Self Measure (PRISM) (Wittmann et al., 2012) was used to map the extent to which people suffered from a chronic disease and thus identified themselves with the disease. It is a 1-item visual instrument, whereby subjects were shown a white A4-size paper with a fixed disk, 7 cm in diameter, at the bottom right-hand corner. Patients are asked to imagine that the board represents their own life as it is at the moment, and the disk represents the patient's 'Self'. Subjects are asked to draw a cross where they would put the (illness to reflect its importance in his or her life at the moment, with smaller values representing greater suffering. Convergent and divergent validity and reliability were good (Büchi et al., 2002; Rumpf et al., 2004a, 2004b).

2.3.7. Social participation

The Scale Functional Remission (FR) (Wiersema et al., 2015) was used to measure social participation based on interview by the professional and file information. The scale contains 3 items: living and self-care; work, education or targeted activities; and social relations. The scores on the items varied from 0 (no problem), 1 (is clearly a problem) and 2 (is a serious manifest problem). Higher total scores indicate more problems in social participation. The internal consistency of the three functional domains was moderately high ($\alpha = .70$; (Wiersema et al., 2015); domains were highly intercorrelated. The inter-rater reliability as a percentage agreement was good (91, 90, 89 and 90%, respectively FR-living, FR-work, FR-contacts and FR-total). Kappa ranged from 0.68, 0.62 and 0.55 for the domains and 0.53 for FR-total and was therefore acceptable.

2.4. Procedure

At intake, the Mini-International Neuropsychiatric Interview (MINI) (Paykel, 2007) was administered by a licensed psychiatrist, psychologist or nurse specialist to classify symptoms according to DSM-5. Patients who met the inclusion criteria were informed at intake by the mental health professional about the study. If necessary, more information about the study was provided by the researcher or a research

assistant. After signing an informed consent, participants were administered self-report questionnaires at the start of treatment and six months later. Participants received treatment as usual: pharmacotherapy and/or psychotherapy (cognitive behavioral therapy or interpersonal therapy), based on patient preference and guideline recommendations through a shared decision-making process. Data were collected between June 2017 and May 2019 and anonymized before analyses.

2.5. Statistical analyses

Analyses were performed with the statistical package Mplus version 7.2 (Muthen and Muthen, 1998-2012). The reason for using Mplus was that missing values can be handled by using all available information in the data with the Full Information Maximum Likelihood (FIML)-estimator. Prerequisite is that missing values are missing at random. With Little's MCAR test it was found that the missing values in the dataset can be understood as random ($\chi^2(263) = 88.48, p = 1.000$).

Improvement over time on the five outcome domains (depressive symptoms, well-being, acceptance, identification and social participation) were tested using paired t-tests.

Pearson correlations were calculated to measure the associations between the five outcome domains, both at baseline and after six months. Correlations were interpreted as follows (Santrock, 2007): very low: $r = 0-0.20$ low: $r = 0.21-0.40$; moderate: $r = 0.41-.60$; moderately high: $r = 0.61-.80$; high: $r = 0.81-.90$, and very high: $r = 0.91-1.0$. Differences between baseline correlations and corresponding correlations after six months were tested, as described in Zou (2007). Intervals for differences between two (dependent) correlations were constructed based on bootstrap sampling. If the 95% confidence interval included the value zero, the difference between the two correlations was not significant.

To explore the moderation effect of acceptance, identification and participation on the relation between depressive symptoms and well-being (see Fig. 1) a three-step approach was followed. In the first step the control variables gender, age and education level were introduced as predictors of well-being. In the second step depressive symptoms and one of the three moderator variables were added as predictors of well-being. In the third step the interaction term depressive symptoms x moderator was added as predictor of well-being. The predictors in the second step were centered (raw score minus mean) and the interaction term in the third step was the product of the two centered predictors, to prevent the so-called multicollinearity problem (uninterpretable regression weights due to artificial high correlations between predictors and interaction term). Three moderation models were tested separately for baseline measures and after six months.

3. Results

3.1. Participant characteristics

A total of 77 patients were analyzed in this study (see Table 1). Most participants were female, with a partner, moderately educated, having paid employment, suffering from severe MDD, according to DSM-5 and having a history of depression. Mean age was 41.9 years ($SD = 11.4$).

After six months it appeared that 16 participants had withdrawn from the study. Drop-out and completers did not differ on baseline characteristics. Differences between completers and dropouts were tested with Fisher's exact test for categorical ordinal variables and Wald tests for interval variables at baseline level. Fisher's exact test showed no significant differences for gender ($p = .164$), marital status ($p = .132$), education ($p = .102$), work situation ($p = .654$) and recurrence of depression ($p = .641$). The Wald tests showed no significant differences for age ($\chi^2(1) = 0.21, p = .648$), social participation ($\chi^2(1) = 0.06, p = .806$), identification with disorder ($\chi^2(1) = 1.66, p = .197$), well-being ($\chi^2(1) = 0.61, p = .434$), depressive symptoms ($\chi^2(1) = 2.18, p = .140$) and acceptance of psychiatric symptoms ($\chi^2(1) = 1.58, p = .209$).

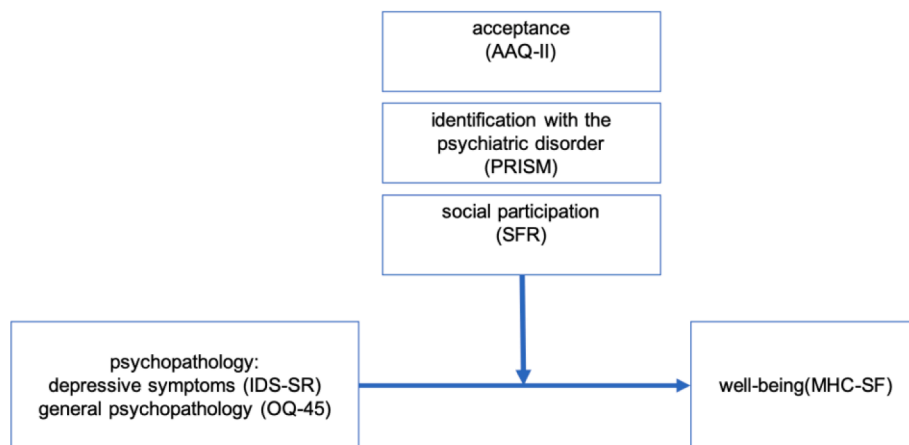


Fig. 1. Moderation model of the relation between psychopathology and well-being, moderated by acceptance, social functioning and identification with the psychiatric disorder?.

Table 1
Characteristics of the study sample.

Characteristic	n	%
Age		
Mean	41.9	
Range	22-64	
SD	11.4	
Gender		
-Male	31	40.3
-Female	46	59.7
Level of education*		
-Low	25	32.5
-Middle	31	40.3
-High	21	27.3
Living situation		
-Single	24	31.2
-With partner	53	68.8
Employment		
-Paid employment	46	59.7
-Study	4	5.2
-Unemployed	27	35.1
Severity of MDD		
-Mild	0	0
-Moderate	28	36.4
-Severe	39	50.6
-Unspecified	10	12.8
History of depression		
-First episode	32	41.6
-Recurrent depression	45	58.4

* low= primary school, lower vocational education; middle= secondary school, intermediate vocational education; high= higher vocational education, university.

3.2. Changes in well-being, depressive symptom severity, acceptance, identification and social participation during treatment

Mean levels and standard deviations of well-being, depressive symptom severity, acceptance, identification and social participation, at

Table 2
paired samples t-test, means (M) and standard deviation (SD) of the five research variables at baseline (T1) and after 6 months (T2).

	Baseline			After 6 months			t	p	d ¹⁾
	N	M	SD	N	M	SD			
MHC-SF total well-being	76	1.57	.96	60	2.23	1.12	-5.51	.000	.71
IDS-SR	76	43.59	13.22	61	30.08	16.38	7.66	.000	.99
AAQ-II	75	31.83	9.80	57	38.24	12.37	-4.57	.000	.61
PRISM	77	1.03	1.11	48	2.57	1.80	-5.86	.000	.84
SFR	77	1.10	.86	54	.54	.74	-5.26	.000	.68

¹⁾ Effect size Cohen's d, 0.2 = small effect, 0.5 = medium effect, 0.8 = large effect.

baseline and after six months are presented in Table 2.

All measures showed improvement over time, with large effect sizes for depressive symptom severity and identification and medium to large effect sizes for well-being, acceptance and participation.

3.3. Relation between well-being, depressive symptom severity, acceptance, identification and social participation at baseline and follow-up

At baseline, well-being correlated moderately with depressive symptom severity ($r = -0.56; p < .001$) and acceptance ($r = 0.56; p < .001$), and low with identification with disorder ($r = 0.32; p < .01$). At baseline, well-being did not correlate with social participation ($r = -0.06; n.s.$). After six months well-being correlated moderately high with depressive symptom severity ($r = -0.79; p < .001$), acceptance ($r = 0.70; p < .001$), and identification with the disorder ($r = 0.67; p < .001$). Well-being correlated moderately with social participation ($r = -0.48; p < .001$). See Table 3. Subscale correlations at baseline and follow-up are presented in the supplementary Table 1 and 2. Correlations of well-being with depressive symptom severity, identification with disorder and social participation were higher at six months, compared to baseline ($p < .05$). The same applies for the correlation of depressive symptom severity with identification with disorder and of identification with disorder with social participation.

3.4. Moderation of the relationship between depressive symptom severity and well-being by acceptance, identification and social participation at baseline and at six months

Results of the three step regression analyses to test moderation effects of acceptance, identification and social participation on the relation between well-being and depressive symptoms are given in Table 4.

The raw model at baseline showed female sex and higher educational level to be associated with well-being, explaining 17% of the variance in well-being. In all three models, depressive symptoms were significantly

Table 3

Correlations between well-being (MHC-SF), depressive symptom severity (IDS-SR), acceptance of the disorder, identification with the disorder (PRISM) and social participation at baseline and after 6 months

	Well-being	Depressive symptom severity	Acceptance	Identification with the disorder	Social participation
Well-being		-.79***	.70***	.67***	-.48***
Depressive symptom severity	-.56***		-.68***	-.70***	.42***
Acceptance	.56***	-.56***		.49***	-.30*
identification with the disorder	.32**	-.41***	.30**		-.38**
Social participation	-.06	.15	-.07	.06	

* $p < .05$.

** $p < .01$.

*** $p < .001$ Below diagonal correlations at T1 (N=77), above diagonal correlations at T2 (N=61).

Table 4

Moderation of the relationship between depressive symptom severity (IDS-SR) and well-being (MHC-SF) by acceptance (AAQII), identification with the disorder (PRISM) and social participation (SFR) at baseline and after six months.

	baseline			After 6 months			ΔR^2	
	beta	p	ΔR^2	beta	p	ΔR^2		
model 1 moderation of acceptance								
Gender	-.35	.001		-.01	.954			
Age	.04	.751		.09	.525			
level of education	.23	.032		.02	.867			
Depressive symptoms	-.42	.000	.17	-.55	.000	.01	.745	
acceptance	.30	.000		.34	.001			
Depressive symptoms x acceptance	-.07	.467	.35	-.06	.444	.66	.000	
			.00			.00	.552	
model 2 moderation of identification with the disorder								
gender, age, education, see model 1			.18			.01	.986	
depressive symptoms	-.48	.000		-.61	.000			
identification	.11	.260		.26	.043			
depressive symptoms x identification	.00	.992	.25	-.16	.076	.64	.000	
			.00			.03	.073	
model 3 moderation of social participation								
gender, age, education, see model 1			.18			.01	.986	
depressive symptoms	-.53	.000		-.70	.000			
social participation	.07	.417		-.21	.027			
depressive symptoms x social participation	.14	.161	.26	.09	.287	.63	.000	
			.01			.01	.325	

ΔR^2 = increase of explained variance in well-being by acceptance, identification and social participation at baseline and after six months.

negatively associated with well-being. Of the three moderators only acceptance was associated with well-being. The three models explained between 25% and 35% of variance in well-being at baseline. The interactions were not significant for each of the three models, which implies no moderation effects.

At six months no control variables were associated with well-being. Depressive symptoms were significantly related with well-being and all three moderators contributed to well-being, in total explaining about 65% of the variance of well-being at six months. Again, the interactions were not significant, indicating no moderation effects on the association between symptom severity and well-being.

4. Discussion

The aim of this study was to investigate the relationship of well-being with depressive symptoms, acceptance, identification, and social participation during treatment of patients with MDD. During treatment, patients improved on all five domains. The most important correlates of well-being were depressive symptom severity and acceptance, both at baseline and after six months treatment. Identification and social participation only showed a moderate relationship to well-being after six months of treatment. There was no evidence for a moderating role of acceptance, identification with the disorder or social participation on the relation between depressive symptom severity and well-being.

In line with the literature, current study findings showed that during

treatment for MDD in a mental health care setting all domains showed improvement (Bond and Bunce, 2003; Breton et al., 2015; Schotanus-Dijkstra et al., 2016; Wittmann et al., 2012; Wood and Joseph, 2010). Importantly, during treatment for MDD, not only the severity of symptom reduced, but also well-being, acceptance, disease identification, and social participation improved. This implies that treatment for patients with MDD contributes to well-being as an element of personal recovery besides symptom recovery. However, findings need to be interpreted with caution, because the nature of this study was observational without control condition. As research showed that patients highly value a broader definition of recovery than only symptom reduction as treatment success which treatment in specialized mental health services seem to generate (Cuijpers, 2020). Other measures than symptom reduction might be useful to measure recovery as part of effectiveness studies or clinical practice.

The current study findings show that acceptance, identification, and social participation are related to well-being at the start of treatment and/or six months later, even when controlling for depressive symptoms. This is in line with the two continua model, suggesting that although well-being and symptoms are related, they are also distinct (Keyes, 2002, 2005). Interestingly, the correlations of well-being with symptoms, identification, and participation were stronger after six months than before treatment, suggesting some kind of integration between these phenomena during treatment. Hence, the two continua do not have one fixed relation, but seems to depend on the kind and severity

of pathology as has also been found in other studies (Franken et al., 2018; van Erp Taalman Kip and Hutschemaekers, 2018; Weijers et al., 2020). As some studies found stronger relations with higher severity (Franken et al., 2018; van Erp Taalman Kip and Hutschemaekers, 2018) and this study found the opposite, an important question for further research is how strong the relation is under different circumstances.

Besides symptom severity, acceptance was the strongest correlate of well-being at both baseline and after six months of treatment. This suggests that these factors are key in the recovery process in patients with MDD. This is in line with previous findings among the general population with mild depression (Fledderus et al., 2013; Manne et al., 2018). Based on our data, it is tempting to speculate that treatments for depression that target acceptance, besides symptoms, might be particularly helpful to improve well-being. Interestingly, recent publications on acceptance and commitment therapy indeed showed that improving acceptance is associated with both depressive symptom reduction and increased well-being (Ataie Moghanloo et al., 2015; Fledderus et al., 2013; Trompetter et al., 2016). Future studies should address whether combined treatment, aiming at both symptom reduction and improving acceptance, have stronger contributions to increased well-being than both treatments separately.

Identification with the disorder and social participation had limited association with well-being, though stronger relations were observed after six months compared to baseline. This suggests that these concepts are less central to perceived well-being in patients with MDD compared to symptom reduction and acceptance. Nevertheless, this suggests that a focus on identification and social participation later in treatment might play a role in maintaining and improving well-being. It would be interesting to further assess at what moment this shifting focus would ideally take place. Mindfulness-based cognitive behavioral therapy or well-being therapy, for example, have mainly been found to be successful after a symptom-oriented treatment (Teasdale et al., 2000).

Furthermore, it might be that the contributions of identification and social participation to well-being are not independent of symptom severity and acceptance in severely depressed patients. Future studies should shed light on the importance of identification and social participation in the recovery process of patients with MDD and domains which patients mention as important in the process of recovery.

5. Strengths and limitations

The current findings should be seen in the light of several strengths and limitations. A first strength in this study is the longitudinal character and the high response rate of 78% from baseline to six months treatment. Another strength in this study is the limited number of exclusion criteria, increasing the generalizability of the current findings. The study sample seems representative for the clinical population of patients with MDD in a mental health care setting. Although participants were collected in one regional mental health center and any effect of selection bias cannot fully be ruled out, this study population seems to be comparable to other studies on patients with MDD in terms of age, gender and symptom severity (Franken et al., 2018; Trompetter et al., 2017). A limitation directly related to the limited number of exclusion criteria is the potential confounding effect of comorbidity on treatment outcomes. Future research might examine whether these results can be generalized to patients with other mental health conditions.

Furthermore, the sample size did not allow comparing the outcomes between different types of treatment patients received on all recovery domains. It might be of interest to investigate potential differences in impact of pharmacotherapy, psychotherapy or a combination of both on the recovery process in depressed patients.

6. Conclusion

Taken together, the current study findings revealed that patients treated for MDD showed increased recovery, defined by decreased

depressive symptoms as well as increased well-being. Symptom severity and acceptance of their condition were the most important contributors to well-being in MDD patients in treatment, whereas identification and social participation only played a role after 6 months treatment. No evidence for moderating effects on the relationship between symptom severity and well-being was found, suggesting this relationship to be independent of the other domains. Future studies should further explore broader measures of recovery than symptom severity in both effect studies and clinical practice, moderators of the relation between symptoms and well-being as well as the role and timing of acceptance, identification, and participation in treatment of patients with MDD.

Author statement

All authors contributed significantly to and approved the submitted manuscript. AW, AS, SR, DC, GW designed the study, AW collected the data, data analyses were carried out by AW, AV and GW, AW wrote the first draft of the manuscript. All authors commented on the manuscript.

The work was financially supported by GGz Oost-Brabant, where data were collected as part of clinical care.

Declaration of Competing Interest

All authors report no actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the work submitted that could inappropriately influence, or be perceived to influence, this work

Acknowledgements

We thank the board of GGZ Oost Brabant for facilitating this study. We wish to thank the research assistants Peter Jansen, Maaïke Zieverink, Marcel Braun and above all, we thank the participants for making this study possible.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2021.09.048.

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