



THE TWO CONTINUA MODEL
AND ITS APPLICABILITY IN
MOOD DISORDER PATIENTS

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Abstract

Objective The two continua model of mental health has been studied widely in the general population. But there is little evidence in the clinical population and especially how the relation of pathology and well-being is constituted in different mental disorders. The goal of this study is to explore the applicability of the two continua model of mental health in the clinical population of mood disorder patients. There is also a demand for longitudinal evidence for the model, to see how the relation develops over a longer period of time, which this study meets. Additionally, this study explores the influence of gender on the relation between pathology and well-being in mood disorder patients.

Methods 419 mood disorder patients were monitored on pathology and well-being over a span of two years in three-month intervals with the OQ-45 and the MHC-SF respectively. The longitudinal data were observed on their change over time, relation to each other in the sense of the two continua model and the differences in gender.

Results Mixed models and regression analysis confirmed that well-being and pathology in mood disorder patients are indeed related, but distinct dimensions like the model proposes. Differences between men and women were not found for the change in well-being and pathology. Lastly, gender has an influence on the relation between pathology and well-being, as the model was a better fit for women than for men.

Conclusion This study expanded on the knowledge that the two continua model of mental health is a more favorable model than the one-dimensional approach to the clinical population of mood disorder patients. It also showed that there is still not done enough to increase well-being in mood disorder patients, while that can have promising effects to reduce pathology.

Table of Contents

1. Introduction.....	4
1.1 Theoretical Framework	4
1.2 Research Goal and Hypotheses	10
2. Methods	12
2.1 Design	12
2.2 Participants.....	12
2.3 Procedure	12
2.4 Measurement	12
2.5 Statistical analysis.....	14
3. Results	16
4. Discussion	21
4.1 Main Findings	21
4.2 Interpretation of Main Findings	21
4.3 Strengths and Limitations.....	24
4.4 Future research	24
4.5 Implications for the practice	25
4.6 Conclusion	26
5. References.....	26

1. Introduction

1.1 Theoretical Framework

Well-being is essential to what makes our lives prosperous. If we are well, we can strive and grow. Yet, when treating patients with mental illnesses, aiming to also increase well-being is a rather recent development. Reduction of pathological symptoms was always in the foreground, while it was assumed that someone who has no pathological symptoms must be happier (Renshaw & Cohen, 2014). Recent development points to the fact that well-being and pathology are not as intertwined as they were assumed to be. Further, it might even be dangerous to overgo the aspect of well-being in diagnosis and treatment (Wood & Tarrier, 2010). For instance, positive characteristics are able to predict mental illness as good as negative ones can (Wood & Tarrier, 2010). Drawing conclusions from pathology alone, to predict and understand mental illnesses can therefore lead to misconceptions about them (Wood & Tarrier, 2010). Especially for patients with mood disorders, it is important to take well-being into account. Due to its symptoms being connected to a decrease in well-being, increasing it may also help alleviate their symptoms (Chakhssi, Kraiss, Sommers-Spijkerman & Bohlmeijer, 2018). Depression for instance, makes up for 8.2% of years lived a disability in the whole world, positioning it at second place (Ferrari et al., 2013). Depression is also marked by a difference in gender prevalence, in which women are affected more often than men (Nolen-Hoeksema, 2001). This study aims to look into the dimensionality of well-being and pathology symptoms in a clinical population affected by mood disorder, while taking into account possible gender differences.

The Positive Psychological Approach

In recent years, more attention has been given to the positive psychological approach in the mental health sector. The World Health Organization (2004, p. 10) reflects this position and states that mental health is “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community”. It is proposed that mental health is not only defined by the absence of mental illness but is rather about mental well-being and individual growth (Keyes, 2005).

Positive mental health can be described as positive feelings as well as functioning well (Westerhof & Keyes, 2010). The current understanding of mental health and well-being is multidimensional and most often includes emotional well-being, psychological well-being and social well-being (Franken, Lamers, Ten Klooster, Bohlmeijer and Westerhof, 2018;

Peter, Roberts & Dengate, 2011; Renshaw & Cohen, 2014). Being emotionally well consists of feelings of joy, satisfaction and a general positive affect towards life itself (Westerhof & Keyes, 2010). Psychological well-being has to do with personal growth and the idea that each individual desires to find purpose and make the most out of one's life. It is more than mere living but striving for what is called optimal functioning (Westerhof & Keyes, 2010). Lastly, since we are social beings, social well-being is about feeling happy and striving within one's social surroundings, to feel welcome and accepted as well as adding to the social environment (Westerhof & Keyes, 2010). Unfortunately, the most popular psychotherapy forms to date, like Cognitive behavioral therapy, are not implementing positive psychology yet, and as a result, are not targeting well-being explicitly (Karwoski, Garratt & Iardi, 2008).

Consequences of flourishing and languishing

The effects of someone flourishing and languishing should not be underestimated. While flourishing describes high mental well-being, languishing is the opposite. Someone without any pathological symptoms, combined with high mental well-being is considered completely mentally healthy and has the least health limitations (Keyes, 2005).

Keyes (2005) discussed that someone who is experiencing long periods of languishing is similarly impaired in functioning as someone who is suffering from a mental disorder. Keyes (2005) found that languishing people had a 12% prevalence rate of cardiovascular disease, compared with the 8% of completely mentally healthy people. Furthermore, people who are not flourishing, so either moderate or languishing, are shown to be less able to perform at work and are psychosocially less successful (Keyes, 2005). Additionally, social isolation, a negative of social well-being, is also considered a risk factor for psychological distress (Seemann, 1996). Keyes (2002) even compared the effects of pure languishing to be similarly psychosocially impairing as a major depressive episode. Especially functioning, as in less productivity, more sick days, physical limitations and higher risk for chronic diseases, was similarly impaired as in depressed individuals (Keyes, 2006). Those adults who suffered from both pathological symptoms and had low mental well-being had the worst mental health impairments by far, including most limitations of activity or workdays lost and had a prevalence of cardiovascular disease of 19% (Keyes, 2005).

But the opposite is also true. Individuals who are mentally well or even flourishing have large benefits. Positive characteristics and feelings can work as a buffer for negative events, also called resilience, which allows more positive individuals to feel less distress and potentially even hinders the development or onset of mental disorders (Wood & Tarrier,

2010). Further, according to Alden and Trew (2013), people which have high positive affect have higher success in their career and social life, than those with lower levels of positive affect. Also, according to the broaden and build theory, positive emotions expand the attention, foster creativity and flexibility and let people enter a positive spiral that continuously grows their well-being (Garland et al., 2010). Another aspect of psychological well-being, optimism, brings along large benefits. Optimistic people can cope much better with stressful events, while pessimists are utilizing more avoidant coping styles (Scheier & Carver, 1992). Also, social well-being has beneficial effects. For example, social integration has protective effects against psychological distress and is associated with declines in depressive symptoms (Seemann, 1996). Seeman (1996) further elaborates that social integration can increase immune and cardiovascular functioning. In sum, positive feelings on all three spectrums make a lot of resources available, like more resilience towards negative events and it lets people enjoy life to the fullest while functioning extraordinary well.

The Two Continua Model of Mental Health

Increasing well-being in clinical populations bears great potential (Chakhssi, Kraiss, Sommers-Spijkerman & Bohlmeijer, 2018). The first step is to understand how it relates to pathology symptoms. An underlying assumption of the more traditional clinical view is that someone who is not mentally ill, is happier (Renshaw & Cohen, 2014). And while that might be the case for some individuals, it cannot be generalized that someone who is free of mental illness, will also be able to live a happy and productive life. Or that someone who is mentally ill, cannot live a happy life. Renshaw and Cohen (2014) state that mental health is therefore not a single continuum that goes from mentally ill to mentally well. The two continua model of mental health and illness states that these two factors are indeed related, but distinct from one another (Westerhof and Keyes, 2010). Mental health can therefore be equally present next to pathology symptoms as it could be to the absence of them. The reduction of mental illness can, but not necessarily will lead to an increase in mental health. In the light of the new understanding of mental health, diminished negative symptoms of a mental disorder would be considered insufficient to name a patient mentally healthy. Research by Franken, Lamers, Ten Klooster, Bohlmeijer and Westerhof (2018) showed that the model is a good fit for an adult clinical population including multiple mental disorders. Further, it was strongly suggested to add measurement of well-being in addition to the measurement of psychopathology in mental health care. Other evidence for the validation of the two continua model can be found for various cultural and demographic backgrounds. Jiang and Lu (2019) demonstrated

applicability of the two continua model for an older adult, Chinese population whereas Raulino, Miranda and Nishimura (2014) applied the model to a Brazilian patient and non-patient group. Further, there is evidence that the model works well within sexual minorities (Peter, Roberts & Dengate, 2011).

Patient Groups and Longitudinal Evidence

To this date there is little evidence how well the model fits within patient groups that are in treatment. Chakhssi, Kraiss, Sommers-Spijkerman and Bohlmeijer (2018) especially advised more research in the clinical setting. While non-clinical settings have been explored to a satisfying extent (e.g. Jiang & Lu, 2019; Raulino, Miranda & Nishimura, 2014; Peter, Roberts & Dengate, 2011), bigger clinical population have been largely untouched. Therefore, this is one of the first studies apply the two continua model to patients in treatment.

Additionally, this is one of the first instances where a study uses longitudinal data. Other studies like the ones from Jiang and Lu (2019), De Vos, Radstaak, Bohlmeijer and Westerhof (2018) or Franken et al. (2018) used cross-sectional designs, the latter specifically recommending a longitudinal design for future research. White and Arzi (2005) describe several benefits of longitudinal studies. Besides the fact that consequences often take longer to manifest themselves, they also talk about cumulative effect of smaller gains. While simple post-tests may not show small differences, they are certainly more visible in a longitudinal study design (White & Arzi, 2005). Further, they allow for a more detailed and accurate insight into development from a former to a present self. Compared with cross-sectional designs, longitudinal studies allow to identify sequences of events, following change over time in specific individuals (Caruana, Roman, Hernández-Sánchez & Solli, 2015). A longitudinal study on the two continua model in the clinical population is newer ground and was neglected until this point.

Mood Disorder

Not only patients in treatment have been overlooked, but there is also little research done on specific mental disorders. Mood disorders mainly include depression, mania and bipolar disorder and are all characterized by drastic shifts in mood, which obstruct the day to day life (Gregory, 2019). Especially depression has been and still is one of the most prevalent mental disorders to date, with 4.4% of the global population being affected (World Health Organization, 2017). The DSM-5 lists a number of relevant criteria for the diagnosis of a depression. Depressed mood, feelings of worthlessness and fatigue on most days show the

negative effect of this mental illness, but there is also the loss of interest and pleasure in activities (American Psychiatric Association, 2013). Moreover, individuals suffering from depression also experience a loss in functioning due to difficulties to concentrate, indecisiveness and slower thought processes. A major depressive disorder therefore not only entails a strong increase in negative pathological symptoms, but as a result of it, also a reduction in positive affect. However, patients in evidence-based treatment are expected to show a decline in pathological symptoms over time.

Depression in that regard is unique due to that fact that both dimensions on the two continua model are taking a turn for the negative, which as described earlier is especially dangerous. On the other hand, positive emotions are related to fewer depressive symptoms, which makes well-being especially helpful for depressed individuals (Lambert, Fincham & Stillman, 2012). They further describe that even specific positive characteristics, in this case gratitude, are having significant influence on depressive symptoms mediated by positive emotions. Fava, Cosci, Guidi and Tomba (2017) have also studied well-being in depressed individuals and how well-being therapy (WBT) can help them. They acknowledge that well-being and pathology vary from individual to individual, but also from disorder to disorder and suggest that these variances may be more understandable when taking positive mental health into the clinical equation. Fava, Cosci, Guidi and Tomba (2017) further elaborate that WBT might be especially suited to treat depressed patients, because of its focus on positive mental health. Insufficiencies in psychological well-being were associated with higher risk of onset and relapse of depression (Fava, Cosci, Guidi & Tomba, 2017). Individual positive traits like autonomy, personal growth or resilience were also mentioned to be particularly helpful to prevent onset and reoccurrence of depression. The first and foremost goal of the current study is to explore how well-being and pathology symptoms change over time and what relation they have to each other in the sense of the two continua model of mental health in mood disorder patients.

Gender Differences in Mood Disorder and Well-being

Another prominent factor in major depressive disorder are the differences in prevalence by gender. While men only have a point prevalence of about 2-3% and a lifetime prevalence of 5-12%, women double both percentages with 5-9% point prevalence and 10-25% lifetime prevalence (Beck & Alford, 2009). These differences start in puberty and last into adulthood. Several reasons have been found for why this might be the case. Nolen-Hoeksema (2001) describes that women are more often victim of abuse and experience

trauma more frequently, due to their often lesser power and status than men. Frequent exposure to these kinds of stressful experiences, even ones that are not as drastic, may have a spiraling effect, which put both biological and mental systems under pressure. This can diminish coping and problem-solving capacities and make women more prone to develop depression (Nolen-Hoeksema, 2001). Further, biological factors like the effects of hormones such as estrogen, have been proven to hold little influence on the prevalence in women (Nolen-Hoeksema, 2001).

A more popular theory about differences in gender in mood disorders is the affect intensity theory. Affect intensity describes individual differences in how people react to emotional stimuli. Individuals which have high affect intensity react stronger to any emotional stimulus, including both positive and negative ones. Fujita, Diener and Sandvik (1991) found that women do not experience more or less emotions than men, but the intensity in which they experience them is higher for both positive and negative emotions. In the light of the theory this would mean that women tend to have higher levels of affect intensity. While this might account for women experiencing strong negative emotions and therefore also depression more intensely, there is hope that the higher affect intensity can work to their benefit. As discussed earlier, positive emotions are beneficial in increasing resilience against negative emotions and have long list of known benefits, especially in hindering the onset and cultivating the recovery from various mental disorders.

Regarding other gender differences in well-being, Ryff (1995) found that women rated themselves higher with regard to positive relations and personal growth. Ryff (1995) could not find any other differences between gender on the dimensions of self-acceptance, autonomy, environmental mastery and purpose in life. This indicates that women tend to score slightly higher on psychological well-being than men, but in total they seem to be on the same level. On the other hand, Keyes (2002) found that women have a higher prevalence of poor mental health as well as depression than men. While pure languishing is equally present in women and men, languishing in women is more prevalent together with depression (Keyes, 2002). Overall the differences in well-being are minor and are therefore not expected to differ between men and women. Pathology on the hand, is more present in women and they are affected stronger by negative emotions, which depression entails to a high degree. Hence, women are expected to be affected stronger by depression than men.

1.2 Research Goal and Hypotheses

Research Goal:

Aim of this study is to determine the relation of well-being and psychopathology symptoms in mood disorder patients, in the sense of the two continua model. The developmental aspect of well-being and pathology is also explored, to identify possible differences over longer spans of time. Further, the differences in well-being and psychopathology symptoms between men and women over time are highlighted.

What is the change in well-being and pathological symptoms over time in mood disorder patients?

Hypothesis 1: Mood disorder patients show a significant decrease in psychopathology symptoms over time.

Hypothesis 2: Mood disorder patients show a significant increase in well-being over time.

What is the relation between changes in well-being and pathological symptoms over time in mood disorder patients?

Hypothesis 3: Pathology symptoms at the first measurement point and the change between the first and third measurement point are a predictor for positive mental well-being one year later.

Hypothesis 4: Positive mental well-being at the first measurement point and the change between the first and third measurement point are a predictor for pathological symptoms one year later.

What are the differences in change in well-being and pathology symptoms between men and women?

Hypothesis 5: Women have significantly higher pathology symptoms than men at the start of treatment.

Hypothesis 6: There is no significant difference in change between men and women in pathology symptoms over time.

Hypothesis 7: There is no significant difference in well-being between men and women at the start of treatment.

Hypothesis 8: Women have significantly higher well-being over time than men.

What are the differences in the relation of change in well-being and pathological symptoms over time between men and women?

Hypothesis 9: Pathology symptoms at the first measurement point and the change between the first and third measurement point are a predictor for positive mental well-being one year later for women and men.

Hypothesis 10: Positive mental well-being at the first measurement point and the change between the first and third measurement point are a predictor for pathological symptoms one year later for women and men.

2. Methods

2.1 Design

For this study an observational longitudinal design with nine measurement points, each three months apart, was used to research the validity of the two continua model in mood disorder patients and the influence of gender.

2.2 Participants

All participants in this study are patients of the Dutch organization “Stichting Steunpunt Geestelijke Zorg (SSGZ)” with a total of 1358 participants. The SSGZ is a foundation that offers professional mental support for those who cannot stay in their current surrounding due to mental problems (Stichting Steunpunt Geestelijke Zorg, n.d.). Patients were asked to participate in a cohort study in consecutive intervals. In this study we will only look at those patients who have a primary diagnosis of mood disorder/depression, which are 419. The sample consists of 45,45% men. Patients are between 19 and 65 years old ($M = 45$). Out of the 419 people at the first measurement point in time, only 80 participated at measurement point nine.

2.3 Procedure

The current study uses a dataset from the Routine Outcome Monitoring (ROM), which is used to monitor changes of patients in treatment in the SSGZ. All patients were once interviewed when they initially started and then every 3 months until the end of treatment. The first data were gathered in March of 2015 and this study includes data till April of 2017. All participants were asked to consent, and all data were later anonymized. The present study includes only those participants who have a primary diagnosis of mood disorder and are in the age interval of 18-65. The diagnosis was completed by a licensed psychiatrist or clinical psychologist via interview. All diagnosis criteria are retrieved from the DSM-V. The advised treatment option and the diagnosis as stated by the psychiatrist was then formally reviewed by a multidisciplinary team and confirmed to be accurate.

2.4 Measurement

For the assessment of well-being and the pathology symptoms, two different measurement scales were used. Well-being was determined by the Mental health continuum – short form (MHC-SF; Keyes et al., 2008; Lamers et al., 2011) and the pathology symptoms by the Outcome Questionnaire (OQ – 45; De Jong, Nugter, Lambert, & Burlingame, 2009).

Mental Health Continuum – Short Form and Well-being

The MHC-SF measures the three earlier described dimensions of well-being, emotional well-being, psychological well-being and social well-being. It consists of 14 items in total where the dimensions are represented by three items, six items and five items respectively (De Jong, Nugter, Lambert, & Burlingame, 2009). Participants pinpoint the frequency in which they experience the item in question on a six-point scale, ranging from “0” (never) to “5” (every day). The lowest possible mean score is “0” (never), the highest possible mean score is “5” (every day). Therefore, higher scores implicate higher well-being. Example questions include “During the past month, how often did you feel satisfied with life?” for emotional well-being, “During the past month, how often did you feel that you belong to a community?” for social well-being and “During the past month, how often did you feel that your life had a sense or meaning to it?” for psychological well-being. Franken, Lamers, Ten Klooster, Bohlmeijer and Westerhof (2018), could provide evidence that the MHC-SF is an eligible tool to access well-being in the clinical population, considering its high reliability and validity.

Outcome Questionnaire and psychopathology symptoms

The OQ-45 is a 45-item long questionnaire that assesses the progression and course of treatment in patients and is especially sensitive for changes which makes it a good tool for repeated monitoring (De Jong et al., 2007). It focuses on individual functioning. This test as well consists of three subcategories which are Symptomatic distress, interpersonal relationships and social role (De Jong et al., 2007). The questionnaire is scored on a five-point scale from “0” (never) to “4” (almost always). Symptomatic distress consists of 25 items and measures the subjective experience of the current complaints of intrapsychic functioning. An example would be “I am irritated”. Interpersonal relations consist of 11 items and measures the satisfaction and problems with romantic partners, family and friends. An example would be “I am unhappy with my marriage/relationship”. Social role consists of nine items and measures the satisfaction, problems, conflicts and stress related to work, study or free time. An example would be “I am working/studying too much”. Further, the OQ-45 contains a number of items that must be reversed. Items 1, 12, 13, 20, 21, 24, 31, 37 and 43 therefore had to be formulated positively. The lowest possible total score is “0”, the highest is “180”. The cutoff score of 63 indicates pathological symptoms of clinical significance. The study by De Jong et al. (2007) supported strong internal validity, criterium validity and concurrent

validity of the OQ-45. Further, the reliability of the whole scale was deemed sufficient with high internal consistency for the population of patients ($\alpha = 0.93$).

2.5 Statistical analysis

SPSS was used for the statistical analysis. At first, to test for normality, a Kolmogorov-Smirnov test was conducted. The OQ-45 was normally distributed ($M=81.74$; $SD=26.75$; $p < 0.068$). The MHC-SF was not normally distributed ($M=1.95$; $SD=1,06$; $p < 0.000$).

To test the hypotheses, three different statistical analyses were used. First of all, mixed models were used to determine hypotheses one, two, six and eight. For all mixed models the best fitting model was an unstructured restricted log-likelihood model. The first two mixed models were used to determine a difference in mean over time for pathology symptoms and well-being in mood disorder patients over 9 points in time. For the first test, the scores on the OQ-45 and for the second test, the scores on the MHC-SF were the dependent variables. The measurement points in time were used as a fixed within subject factor to determine the course of development over time and the participants as random factors. Additionally, a paired sample t-test was conducted to calculate Cohen's d for the first and last measurement point, to determine the effect size of the change in OQ-45 scores as well as in MHC-SF scores over the treatment time. In order to test hypothesis six, the mixed model was handled with time as a fixed within-subjects factor and gender as a between-subjects factor, to determine the mean difference of women and men in the dependent variable pathology symptoms over time. For hypothesis eight, the mixed model was used with time as a within-subjects factor and gender as a between-subjects factor, to determine the difference in mean of women and men in the dependent variable well-being over time. The participants were still random factors for the latter two.

Second, two one-way ANOVA's were used. For hypothesis five, it was used to compare the means in psychopathology symptoms between men and women at the first point of measurement to see whether they differed at the initial start of treatment. To test hypothesis seven, a one-way ANOVA was used to compare the means in well-being scores between men and women at the first point of measurement to see whether they differed at the initial start of treatment.

Lastly, linear regression analyses were used to determine hypotheses three, four, nine and ten. Due to inconsistent participation over the nine measurement points, the regression analyses are only using measurement points one through five. To test hypothesis three and four, two linear regressions were applied to determine the predictive value of pathology

symptoms at the first measurement point and the change between the first and third measurement point in time for well-being one year later for hypothesis three and vice versa for the fourth hypothesis. Hypothesis nine and ten were tested by using four linear regressions. The regressions used for this analysis are the same as in hypothesis three and four. Only this time the data was divided into men and women to see whether men or women show better predictive ability for pathology symptoms and well-being. For hypothesis nine, the predictive value of pathology symptoms in men and women was viewed independently, to see whether the first measurement point in time and the change between the first and third measurement point time can predict well-being one year later for men and women. For hypothesis ten, the predictive value of well-being in men and women was viewed independently, to see whether the first measurement point in time and the change between the first and third measurement point time can predict pathology symptoms one year later for men and women.

3. Results

For hypothesis one and two, linear mixed models were conducted. For hypothesis one the analysis revealed a significant main effect of treatment time [$F(1,8)=7.70;p<0.000$]. The estimated marginal means in table 1, show that the mean total of psychological symptoms decreases significantly over the 9 treatment moments. The highest decreases were in the first year. Afterwards the changes were not as strong as at the start. Additionally, Cohen's d was calculated [$d = -0.43$]. In accordance with hypothesis one, there was a significant decrease in pathological symptoms over time.

Table 1

Estimated mean scores and standard deviations of pathological symptoms in men, women and in total for all nine treatment moments

Treatment Moments	Total Mean	Std. Deviation	Men Mean	Std. Deviation	Women Mean	Std. Deviation
0	86.50	1.30	87.97	1.89	85.02	1.72
1	82.94	1.34	86.31	1.97	79.57	1.82
2	81.53	1.52	83.95	2.24	79.11	2.05
3	79.45	1.64	81.07	2.46	77.82	2.17
4	76.95	1.65	79.45	2.47	74.45	2.17
5	78.63	1.68	82.76	2.54	74.50	2.21
6	76.89	1.89	82.30	2.85	71.48	2.49
7	77.12	1.96	81.13	2.93	73.11	2.61
8	74.22	2.42	78.45	3.65	69.99	3.16

For hypothesis two the analysis also showed a significant main effect of treatment time [$F(1,8)=4.22;p<0.000$]. The estimated marginal means shown in table 2, show that the mean total of well-being scores increase significantly over the 9 treatment moments. Cohen's d was also calculated [$d = 0.15$]. Comparing both effect sizes of the OQ-45 and the MHC-SF, the changes in pathology symptoms are stronger, indicated by a higher effect size. In accordance with hypothesis two, well-being significantly increased over time.

Table 2

Estimated mean scores and standard deviations of well-being in men, women and in total for all nine treatment moments

Treatment Moments	Total Mean	Std. Deviation	Men Mean	Std. Deviation	Women Mean	Std. Deviation
0	1.80	.05	1.76	.07	1.83	.07
1	1.93	.06	1.83	.09	2.04	.08
2	1.95	.06	1.91	.09	1.99	.08
3	2.01	.06	1.96	.09	2.05	.08
4	2.02	.07	1.95	.10	2.10	.09
5	2.04	.07	1.94	.10	2.15	.09
6	2.07	.08	1.89	.12	2.25	.11
7	2.17	.08	1.98	.12	2.37	.11
8	2.14	.10	2.01	.15	2.27	.13

For hypothesis three and four a linear regression was conducted. The results can be found in table 3. For hypothesis three the analysis revealed that pathological symptoms at the start of treatment was a significant predictor for positive mental well-being one year later. The change between the first and third measurement point, was also a significant predictor for well-being. Pathology symptoms also explain a significant proportion of variance in well-being scores ($R^2 = .276$, $F(2, 112) = 21,37$ $p < .000$). This confirms hypothesis three.

For hypothesis four the analysis revealed that well-being at the start of treatment was a significant predictor for pathological symptoms one year later. The results can be found in table 4. The change between the first and third measurement point in well-being, was also a significant predictor for pathological symptoms. Well-being also explains a significant proportion of variance in pathology symptom scores ($R^2 = .379$, $F(2, 113) = 34,42$ $p < .000$). Well-being could explain a slightly higher variance than pathology symptoms. This confirms hypothesis four.

For hypothesis five, a one-way ANOVA was conducted. It revealed no significant difference in means between men and women [$F(1, 405) = 1.14$, $p = 0.285$]. Women have no higher pathology symptoms at the start of treatment, which rejects hypothesis five.

For hypothesis six, a linear mixed model was used. The analysis revealed a significant main effect of gender [$F(1,8)=5.76;p<0.017$]. The interaction effect of treatment time and

gender was not significant [$F(1,8)=1.23;p<0.282$]. The estimated marginal means for both men and women can be seen in table 1. While there is no interaction effect, women on average do score lower over time than men. Nevertheless, there is no significant interaction effect of gender, which confirms hypothesis six.

For hypothesis seven, a one-way ANOVA was conducted. It revealed no significant difference in means between men and women [$F(1, 417) = .596, p = 0.44$]. Neither men nor women have higher well-being at the start of treatment, which is in accordance with hypothesis seven.

For hypothesis eight, a linear mixed model was conducted. For this hypothesis the analysis revealed no significant main effect of gender [$F(1,8)=3.73;p<0.054$]. The interaction effect of treatment time and gender was not significant [$F(1,8)=1.01;p<0.367$]. The estimated marginal means for both men and women can be found in table 2. No significant interaction effect was found which rejects hypothesis eight.

For hypothesis nine a linear regression was conducted. The Beta values and R^2 can be found in table 3. The test revealed that pathology symptoms at the start of treatment was a significant predictor for well-being scores one year later for men. The change between the first and third measurement point of pathological symptoms was also a significant predictor for well-being scores for men. Pathology symptoms also explains a significant proportion of variance in well-being scores for men ($R^2 = .417, F(2, 43) = 15.37 p < .000$). Further, the test revealed that pathological symptoms at the start of treatment was a significant predictor for well-being scores one year later for women. The change between the first and third measurement point of pathological symptoms was also a significant predictor for well-being scores for women. Pathology symptoms also explain a significant proportion of variance in well-being scores for women ($R^2 = .199, F(2, 66) = 8.21 p < .001$). Predictive values were similar in both men and women, but the explained variance in men was double the one in women. Pathological symptoms are a significant predictor for both men and women, but the explained variance in men is higher, which rejects hypothesis nine.

Table 3

Beta values and R² of the linear regression of men and women predicting well-being one year later.

Variables	Beta	Beta	Beta
	Total	Men	Women
t0 symptoms	-.51***	-.68***	-.39**
t3- t0 symptoms	-.36***	-.41**	-.34**
R ²	.28***	.42***	.20***

*Note *p< .05, **p<.01, ***p<.001

For hypothesis ten a linear regression was conducted. The Beta values and R² can be found in table 4. The test revealed that well-being at the start of treatment was a significant predictor for pathology symptoms one year later for men. The change between the first and third measurement point of well-being was also a significant predictor for pathology symptoms for men. Well-being also explains a significant proportion of variance in pathology symptoms for men ($R^2 = .468$, $F(2, 44) = 19.35$ $p < .000$). Further, the test revealed that well-being at the start of treatment was a significant predictor for pathology symptoms one year later for women. The change between the first and third measurement point of well-being was also a significant predictor for pathology symptoms for women. Well-being also explains a significant proportion of variance in pathology symptoms for women ($R^2 = .297$, $F(2, 66) = 13.95$ $p < .000$). Again, predictive values were similar in both men and women, the explained variance in men was almost double the one in women. Well-being is a significant predictor for both men and women, but the explained variance in men is higher, which rejects hypothesis ten.

Table 4

Beta values and R² of the linear regression of men and women predicting pathology symptoms one year later.

Variables	Beta	Beta	Beta
	Total	Men	Women
t0 Well-being	-.54***	-.57***	-.51***
t3- t0 Well-being	-.45***	-.50***	-.39***
R ²	.38***	.47***	.30***

*Note *p< .05, **p<.01, ***p<.001

4. Discussion

4.1 Main Findings

The hypotheses regarding the applicability of the two continua model in mood disorder patients were confirmed. Regarding the first research question, in the clinical population of mood disorder patients, pathology symptoms are decreasing significantly over time, while well-being is also significantly increasing, but not in high amounts. Regarding the second research question, well-being and pathology symptoms could predict each other's changes in scores well. It could be argued that well-being scores are slightly better able to predict pathology.

The hypotheses regarding the role of gender in mood disorder patients and its influence on pathology and well-being could not all be confirmed. Men and women proved to be very equal in the amount of pathology and well-being they experience at the start of treatment and also how they develop both over the course of the treatment. Regarding the third research question, in the clinical population of mood disorder patients, men and women have equal starting points regarding pathology symptoms and mental well-being. Gender does not have an influence on the change in pathology symptoms nor well-being over the course of time.

Lastly, the hypotheses regarding the influence of gender on the relation of well-being and pathology in the sense of the two continua model, could not be confirmed. Men unexpectedly explained a higher amount of variance, which indicates that the model is a better fit for women than for men.

4.2 Interpretation of Main Findings

The main findings support the applicability of the two continua model in the clinical population of mood disorder patients. The significant decreases in pathological symptoms were accompanied by significant, yet low increases in well-being. The increase is not very high though and drops off after the second measurement point. A strong increase was not expected, since well-being is not targeted in most traditional treatment forms. The effect size comparison between tests confirmed that the increase in pathology was stronger. The average is still very low at the end of two years in comparison with the general population (Schotanus-Dijkstra, Drossaert, Pieterse, Boon, Walburg & Bohlmeijer, 2017; Sommers-Spijkerman, Trompetter, Schreurs & Bohlmeijer, 2018). Therefore, the clinical population of individuals with mood disorders score lower in well-being than the general population, even after two years of treatment.

The two-dimensional model of mental health describes that both dimensions are distinct, but yet related, which was confirmed (Westerhof & Keyes, 2010). Predictability was significant yet moderately strong for both well-being and pathology, which indicates that they are related, but not on opponent ends of one dimension. Rather, they are connected but on two different dimensions like the model proposes, as was found in multiple studies for the general population (Raulino, Miranda & Nishimura, 2014; Peter, Roberts & Dengate, 2011; Jiang & Lu, 2019). For well-being, the predictability and explained variance was slightly higher, which is in accordance with the idea that positive resources can help with pathology symptoms, while the absence of them might be harmful (Lambert, Fincham & Stillman, 2012). For mood disorder patients this means that pathology is often accompanied by negative mental well-being, which was expected. But it also means that improving mental well-being will have a stronger effect on pathology, than reducing pathology symptoms to increase well-being.

The observed connection between well-being and pathology could also be due to the strong connection of depression and its effect on well-being, which would also explain a higher predictive ability (American Psychiatric Association, 2013). Franken et al. (2018), could find that the correlation between well-being and pathology is higher in mood disorder patients when compared to anxiety, personality or developmental disorders. Additionally, standard therapy procedures for depressed individuals use a lot of techniques to alleviate feelings of depressed mood, like getting the client to be more active, more social as well as plan making (Bannink, 2012; Westbrook, Kennerley & Kirk, 2017). These exercises by nature make life more enjoyable and teach some of the important skills to increase well-being. Plan making for example increases autonomy, a very promising skill that increases psychological well-being, which is especially helpful in treating depressed individuals (Fava, Cosci, Guidi & Tomba, 2017). Also being more socially active is as Seemann (1996) explains, connected to a decrease in depressive symptoms as well as building a buffer towards distress, allowing to grow more social well-being.

The next surprising finding was that women and men have very similar starting points, as well as a very similar development of pathology and well-being over the course of treatment. While literature points towards women being more prone to developing mood disorders, there were no different starting points for men and women in this population (Beck & Alford, 2009). However, higher prevalence does not necessarily mean that women are experiencing depression stronger than men. Differences were expected due to the affect intensity and the ability of women to more effectively recognize and communicate internally

focused moods, as well as more frequent encounters with stressors and stress reactions (Fujita, Diener and Sandvik, 1991; Nolen-Hoeksema, 2001). None of these differentiating factors seemed to have an impact on this population. While women have fewer symptoms on average throughout the treatment, this change cannot be attributed to the interaction of time and gender.

Previous studies were all conducted in the general population, which indicates that women and men are more similar in the clinical population. Mackenzie, Gekoski and Knox (2006) as well as Leong and Zachar (1999) explain that women are more open to seek help with mental issues, while men are more reluctant. Which means that men and women in the clinical population already share a willingness to seek help, which is not given in the general population. The same is true for the attitude towards mental illness. In the general population, women have a more positive attitude towards mental illness than men, which is not necessarily true for the clinical population (Leong & Zachar, 1999). Experience of, or exposure to mental illness can alter the perception and attitude towards it in a favorable way (Angermeyer & Matschinger, 1996). The willingness to seek support, openness for treatment and a favorable attitude towards mental illness in general seems to be different between the general and clinical population, which may explain the strong similarities between men and women in this study.

Lastly, it was found that in mood disorder patients, gender has a connection to the relation of well-being and pathology in the sense of the two continua model. Against expectations men could explain a higher variance, which indicates that pathology and well-being have a stronger influence on each other in men than in women. As explained before, women in the general population are more open to seek help with mental issues, while men are more reluctant (Mackenzie, Gekoski and Knox, 2006; Leong and Zachar, 1999). Also, cultural stressors make expression of symptoms and therefore diagnosis less likely in men, possibly until a point where symptoms get too strong (Cochran & Rabinowitz, 2003). This may result in more severe cases of depression in the clinical population of mood disorder patients. Adding the already heightened connection between pathology and well-being in mood disorder, this might explain a stronger connection between the two constructs in men. This was confirmed in a study researching the differences in disability by disorder between men and women, in which depressed males were more impaired than women (Scott, 2011). Consequently, the model is a better fit for women in the population of mood disorder patients. Their openness to seek mental help, can result in earlier recognition of mental disorders and make treatability more likely for them (Mackenzie, Gekoski and Knox, 2006).

4.3 Strengths and Limitations

There was a demand to research the two continua model with a longitudinal design, which this study could meet as one of the first (De Vos, Radstaak, Bohlmeijer and Westerhof, 2018). A longitudinal design is one of the most useful tools to determine changes over a longer period of time (White and Arzi 2005). This allowed for a better comprehension of how the relation of well-being and pathology is structured over longer periods of time. The large number of participants from a clinical population was also a novelty. Before, only the general population was used, while this study provides first evidence for the clinical population. Furthermore, it specifically targeted individuals with mood disorders, which proved to have a special place in the two-continua model, due to the disorders impact on well-being as well as pathology symptoms. This study also started the identification of demographic variables and their influence on the relation between well-being and pathology by adding gender as a predictor.

Also a few limitations should be recognized. Since the measurement period spanned over multiple years, dropout rates were high towards the end of the study. Participants also sometimes forgot to fill in the questionnaire or were not attending, which increased towards the end of the collection period. This was also the reason why the regressions for hypothesis three, four, nine and ten were only conducted for the first year of measurement. Participation in that time span was more consistent. The study could therefore not use the full two-year period and see how scores develop later in treatment. For future research it would be interesting how the data compare over a longer period of time.

The longitudinal design does also bring some disadvantages. Due to the nature of therapy, participants who respond well to the treatment will leave earlier than those who have difficulties. For other patients their particular treatment program may have not been the right one and these will stay longer in treatment. This might mean that at later points of measurement, a higher number of clients that did not respond to the treatment might be present and those for whom it worked fine might be absent. The percentage of chronic patients in the population would also increase that way. This could taint the scores in a more negative way. Scores later in treatment must therefore be examined with caution.

4.4 Future research

This study was specialized on a specific disorder, in this case mood disorder, and zooms in on the relation of gender and well-being as well as pathology symptoms. Research on the two continua model is still novel and there is little evidence on how men and women differ within

this model. This study suggests that well-being and pathology are more related in men than in women, with little evidence to explain such an occurrence. This relation should be subject to further exploration.

For future research it would also be interesting to expand the knowledge within the clinical population, to see whether similar effects can be found in different mental disorders. Further, patient data collected from different institutions would make for an interesting comparison to the ones collected in this one, to see whether these values stay consistent. Additionally, one could add more demographic variables to the analysis. This study looked into the role of gender, but there are many more variables that may have an effect on the relation of well-being and pathology. Suggestions would be age, occupational status as well as socio-economic status. Similarly interesting would be to look at the different subscales from the MHC-SF individually to find out which part of well-being is improving the most and how this affects pathology symptoms.

Another addition would be to look at different treatment programs within the clinical population. While it would be interesting to compare samples from different clinics to see whether the evidence gathered in this study is similar to those of other clinics, the treatment effects of different forms of therapy would be more interesting. Especially therapy with a positive psychological background would make for a great comparison to the more traditional therapy forms used with the patients in this study. There are multiple different forms of therapy that might influence how well-being and pathology behave, for example Acceptance and Commitment Therapy (ACT) or Mindfulness-based cognitive behavioral therapy (MCBT).

4.5 Implications for the practice

First and foremost, this study showed that the two continua model of mental health is applicable in mood disorder patients, which also has several implications. Working to improve on well-being should therefore be implemented in more treatment programs to ensure that patients with mood disorder are receiving optimal help. Very promising is that mood disorder patients profit firmly from positive emotions (Fava, Cosci, Guidi & Tomba, 2017). In the light that the effect of increasing well-being is better in decreasing pathology than vice versa, the integration of interventions that increase mental well-being are strongly suggested. Moreover, lower well-being will also take a higher toll on the increase in pathology than vice versa, which makes failing to address well-being in therapy even more

dangerous. Multiple studies provide evidence that increasing well-being especially in depressed individuals is effective for its treatment (Sin & Lyubomirsky, 2009; Fava, Rafanelli, Cazzaro, Conti & Grandi, 1998; Fava, & Ruini, 2003). In other words, the current dominant treatment forms need to be reevaluated, whether they meet the modern standards of positive living and functioning.

Furthermore, this study showed that there is still a need to improve well-being in the clinical population of mood disorder patients. The increases in well-being are only marginal with an effect size of [$d = 0.15$], even over a two-year period of treatment. This reflects how little well-being is targeted as well as how little it increases just by decreasing pathology in therapy.

When working with men, it is advised to pay special attention to social and societal pressure that might incline some men to downplay symptoms or have difficulty accepting that they suffer from a mental disorder. Overlooking this might start a downward spiral, that may lead to more severe cases of mental illness.

4.6 Conclusion

This study expanded on the knowledge that the two continua model of mental health is a more favorable model than the one-dimensional approach for the clinical population of mood disorder patients. In mood disorder patients the connection between pathology and well-being is also higher than in the general population, due to the nature of the illness. It also showed that well-being is still falling short in the traditional treatment forms of mood disorders, which needs to be addressed. Men and women were found to be consistently similar in how pathology and well-being develop over time, which stands in contrast to the dissimilar prevalence rates. Contrary, gender is influencing the relationship between pathology and well-being, where women were found to be a better fit for the model, due to their openness for treatment and men's hesitation to express symptoms and seek help.

5. References

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