Master Thesis

Bipolar Disorder and well-being;
is well-being associated with symptoms and moderated by type of diagnosis?

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Abstract

Background. Bipolar Disorder (BD) is a chronic mood disorder specified in type I (BD-I) and type II (BD-II). Both types are characterized by recurrent depressive episodes and BD-I is characterized by mania and BD-II by hypomania. Besides clinical recovery of BD, it is also important to improve mental health of people with BD. The two continua model states that mental health constitutes both the presence of well-being and the absence of psychopathology. The Mental Health Continuum-Short Form (MHC-SF) was developed to measure well-being and to categorize individuals into the levels of mental health. So far, little research is conducted on well-being in people with BD. It remains unknown if they can flourish and how mental health is associated with symptomatology. This is important to investigate, since well-being and flourishing may be protecting factors against the recurrence of symptoms of BD. Therefore, this research aimed to investigate well-being of people with BD, its association with depressive and manic symptoms and the potential moderation by type of BD.

Method. A cross-sectional online survey study was conducted in which 107 adult self-selected participants with BD took part. The MHC-SF, Hospital Anxiety and Depression Scale (HADS) and Altman Self-Rating Mania Scale (ASRM) were administered. Descriptive statistics, t-tests, chi-square tests, simple linear regression analyses and multiple regression analyses with the PROCESS macro 1 were performed to explore well-being among people with BD.

Results. The level of well-being was significantly lower for the participants (M = 2.12, SD = 1.02) than the general Dutch population (M = 2.98, SD = 0.85). In total, 32.7% of the participants were languishing compared to 1.6% of the population, 44.9% experienced moderate mental health compared to 61.9% of the population and 14.3% were flourishing compared to 36.5% of the population. Depressive symptoms were predictive of well-being (F (1, 95) = 78.148, p <.001, R^2 = .451) while manic symptoms were not (F (1, 95) = 3.430, p = .067, R^2 = .187). No significant difference was found in the level of well-being between BD-I and BD-II participants. Also, no moderation effect was found for type of BD on the association between depressive and manic symptoms and well-being.

Conclusions. People with BD experienced lower levels of well-being compared to the general population which was associated with depressive symptoms and not with manic symptoms. The majority of people with BD experienced moderate mental health and a small group was flourishing. The level of well-being did not differ for type of BD and type of BD did not change the relationship between depressive and manic symptoms and well-being. Therefore, people with BD-I and BD-II could receive the same interventions to improve well-being.

Introduction

Bipolar disorder (BD) is a chronic disorder with disturbances in mood. These disturbances are characterized by alternating depressive and (hypo) manic episodes (Goodwin, 2016; Grande, Berk, Birmaher, & Vieta, 2015). BD can be specified in Bipolar I disorder (BD-I) and Bipolar II disorder (BD-II) (American Psychiatric Association, 2013). In BD-I, people have a history of both manic and depressive episodes. People who are diagnosed with BD-II have a history of depressive and hypomanic episodes but no full manic episodes. The lifetime prevalence rates for both subtypes of BD in the general population suggests that BD-II is more common (Goodwin, 2016). A meta-analysis revealed that in the general population, the lifetime prevalence rate for BD-I is 1.1% and 1.6% for BD-II (Clemente, et al., 2015). Specifically for Dutch adults, the lifetime prevalence rate of BD-I and BD-II is 1.3% (De Graaf, Ten Have, & van Dorsselaer, 2010).

BD is associated with a significant impact on individuals' occupational, social and general functioning and their well-being (Revicki, Matza, Flood, & Lloyd, 2005; Rosa et al., 2010). In addition, BD is also associated with an increased risk of suicide (Pompili et al., 2013; ten Have, Vollebergh, Bijl, & Nolen, 2002). Research showed that 59.3% of the Dutch adults with BD-I have suicidal ideations and 19.8% have made a suicide attempt (ten Have et al., 2002). Given this, BD is associated with a decreased quality of life (Dean, Gerner, & Gerner, 2004). Moreover, people with BD perceive a significant lower quality of life compared to people with other types of mental disorders (ten Have et al., 2002).

During the past years, the number of studies about concepts as mental health and well-being increased (Vaillant, 2012). Diener and colleagues viewed mental health as subjective well-being, which is the cognitive and affective evaluation of an individual's life (Diener, Suh, Lucas, & Smith, 1999; Diener, 2000). Later on, the World Health Organization (WHO) defined mental health "as a state of well-being in which the individual realizes own abilities, can cope with normal stresses of life, can work productively and fruitfully, and is able to make a contribution to the community" (World Health Organization, 2005). In addition to this, Keyes views well-being as an important aspect of mental health (Keyes, 2002; Keyes, 2005). According to Keyes, well-being consists of three dimensions, an emotional, social and psychological dimension (Keyes, 2002). First, emotional well-being is the absence or presence of positive feelings about life. Second, social well-being can be described as an evaluation of public and social functioning. Third, psychological well-being is the presence or absence of positive functioning in life, such as self-acceptance, personal growth and purpose

in life (Keyes, 2002). So, well-being is according to Keyes (2002) a combination of emotional, social and psychological well-being.

Recent developments within psychology emphasize the importance of well-being and the reduction of symptoms. In this way, well-being is related to mental illness in the two continua model. This model proposes that well-being and mental illness are related but are both on separate dimensions (Keyes, 2002; Westerhof & Keyes, 2010). So, one dimension indicates the presence or absence of well-being and the other indicates the presence or absence of mental illness. This indicates that it is possible to experience a high level of well-being while also experiencing symptoms. Therefore, complete mental health can be viewed as a complete state, which means not solely the absence of mental illness but also the presence of well-being (Keyes, 2002; Satcher, 2000; Westerhof & Keyes, 2010; World Health Organization, 2004).

Furthermore, Keyes (2002) divided mental health in three different levels in order to be able to 'diagnose' individuals with the different levels of mental health. Keyes (2002) used the DSM approach as a theoretical guide for the diagnosis of mental health by using the Mental Health Continuum-Short Form (MHC-SF; Keyes, 2002; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011). The MHC-SF is a self-report questionnaire and contains several items assessing well-being. With this instrument, individuals can be categorized into three levels of mental health, which are flourishing, languishing and moderate mental health. Research showed that flourishing also may occur with an episode of mental illness (Keyes, 2002). Moreover, individuals who are flourishing and have an episode of mental illness, function better compared to individuals who are categorized with moderate mental health (Westerhof & Keyes, 2010).

In line with the different levels of mental health, Schotanus-Dijkstra and colleagues (2016) conducted research about prevalence rates of mental health in a representative sample of the general adult Dutch population. They showed that 36.5% of the population flourished. Only 1.6% of the population languished and 61.9% of the population was in moderate mental health. In addition to these prevalence rates, socio-demographics such as a younger age, higher education and the female gender were positively related to flourishing in the general adult Dutch population (Schotanus-Dijkstra et al., 2016).

More research conducted on mental health showed that high levels of mental health can protect individuals from symptoms of mental disorders and psychological problems. Researchers concluded that low levels of mental health are a risk factor for mental disorders and psychological problems (Iasiello, van Agteren, Keyes, & Cochrane, 2019; Keyes, Dhingra, & Simoes, 2010). Besides that, research indicated that when individuals gain or

maintain high levels of mental health, they are more likely to recover from an affective disorder (Iasiello et al., 2019). Since BD is a chronic affective disorder (American Psychiatric Association, 2013), gaining or maintaining high levels of well-being is important in order to prevent recurring mood episodes.

In sum, well-being and flourishing may be protecting factors against the recurrence of symptoms of an affective disorder such as BD (Iasiello et al., 2019; Keyes et al., 2010). However, not much is yet known about the level of well-being and mental health among people with BD (Michalak, Murray, Young, & Lam, 2008). So far, it is unclear whether people with BD are able to achieve high levels of well-being or whether they can flourish. Therefore, it is important to investigate the level of well-being and the ability to flourish, since BD is a chronic disorder and it is important to know if people with BD can flourish even though they experience symptoms. Furthermore, investigating the level of well-being among people with BD is necessary in order to give implications for appropriate treatment to increase the level of well-being (Cooke, Robb, Young, & Joffe, 1996).

In order to focus on well-being in treating people with BD, determinants that may have an impact on the level of well-being have to be investigated. First of all, research has shown that the level of psychosocial functioning is more negatively affected by experiencing depressive symptoms compared to experiencing (hypo) manic symptoms (Rosa et al., 2010). Furthermore, it turns out that depression is the predominant mood symptom in BD, which results in a majority of people who experience symptoms or full episodes of depression more frequently than symptoms or episodes of (hypo) mania (Judd et al., 2002; Judd et al., 2003a; Judd et al., 2003b). In addition to this, depressive symptoms in BD seem to be the strongest predictor of well-being and health in general (Kessing, Hansen, & Bech, 2006).

Thus, on one hand it can be concluded that depressive symptoms in BD have a strong negative impact on the level of well-being. On the other hand, less is known about the impact of (hypo) manic symptoms in BD on the level of well-being (Michalak et al., 2008). As stated before, BD can be divided into BD-I with depressive and manic episodes and in BD-II with depressive and hypomanic episodes (American Psychiatric Association, 2013). Research confirmed that people with BD-I are more likely to experience acute mania and psychotic symptoms compared to people with BD-II (Vieta, Gasto, Otero, Nieto, & Vallejo, 1997). Other research views BD-II as a depressive disorder with occasional major depressive episodes and infrequent weeks of hypomanic symptoms (Judd et al., 2003a; Judd et al., 2003b). When comparing acute mania and psychotic symptoms to infrequent hypomanic symptoms, it turns out that acute mania and psychotic symptoms have a larger impact on the

quality of life, since these people are more likely to be hospitalized (Michalak et al., 2008). For these reasons, it can be hypothesized that people with BD-I experience lower levels of well-being compared to people with BD-II. Therefore, the potential moderating role of type of BD for the relationship between symptoms and well-being can be explored.

The current study is a post-hoc analysis of a cross-sectional survey study conducted by Kraiss and colleagues (2019). Since there is a lack of knowledge about well-being and BD (Michalak et al., 2008), the aim of this study was to further investigate this concept among people with BD. For this, six research questions were formulated:

1. What is the general level of well-being among people with BD compared with the general Dutch population?
2. What percentage of people with BD is flourishing, languishing and has moderate mental health compared to the general Dutch population?
3. What are the differences in socio-demographics of people with BD between the categories of mental health?
4. Is well-being associated differently with depressive symptoms and manic symptoms?
5. Is there a difference in the level of well-being among people with BD-I and people with BD-II?
6. Is there a moderation effect of type of diagnosis for the relationship between depressive and manic symptoms and well-being?

Method

This study used the dataset of a recent cross-sectional survey study about the psychometric properties and utility of questionnaires about responses to positive affect, personal recovery, well-being, social role participation and symptomatology in a sample of people with BD (Kraiss et al., 2019).

Participants

In the study by Kraiss and colleagues (2019), a convenience sample of 107 adults with BD were gathered from the Dutch Patient Association for Bipolar Patients and their Relatives (Vereniging voor Manisch Depressieven en Betrokkenen, VMDB). Participants were asked to fill out demographic variables and to specify the type of diagnosis. Thereafter, the participants filled out several standardized questionnaires to assess well-being and symptomatology.

Design & Procedure

The anonymous cross-sectional survey was conducted through the online survey tool LimeSurvey and data were collected between April and July 2018. Participants were recruited

through an email send to all members and through a notice in the newsletter of the patient federation. The enrollment of the participants was based on self-selection. At the start of the survey, participants were informed about voluntary participation, that they could quit at any time and that data was processed anonymously and confidentially. Participants signed an online informed consent form. Ten vouchers of 50 euro were raffled among the participants of the study.

Measures

At the beginning of the survey, the participants filled out their diagnosis. Thereafter, three standardized questionnaires were used to assess the relevant constructs. Firstly, the MHC-SF (Lamers et al., 2011) was administered. This is a self-report questionnaire with 14 items assessing well-being. Well-being is measured on three subscales: emotional well-being with three items, psychological well-being with six items and social well-being with five items. Participants reported the frequency of feelings in the past month on a 6-point Likert scale. A high total score on the MHC-SF means a high level of well-being.

In order to flourish, individuals have to report that they experience 'everyday' (5) or 'almost every day' (4) for at least one of the three items on the emotional well-being scale (items 1 till 3). In addition, individuals also have to report a score of 'everyday' (5) or 'almost every day' (4) for at least six of the eleven items on psychological and social well-being scale (items 4 till 14; Lamers et al. 2011). The Dutch translation of the MHC-SF was used and this version has a high internal consistency for the subscales emotional (α = .83) and psychological well-being (α = .83). Besides that, the Dutch MHC-SF has an adequate reliability for social well-being (α = .74). The total scale can be viewed as highly internally consistent (α = .89; Lamers et al., 2011). In this study, similar Cronbach's α's of .89 for emotional well-being, .87 for psychological well-being, .67 for social well-being and .91 for the total scale were found.

Secondly, to measure depressive symptoms, the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was administered. The HADS exists of two subscales with both seven items: anxiety and depressive symptoms. Only the Depression Scale was used in this study, since especially depressive symptoms were considered relevant for BD to measure. The frequency of symptoms over the past week are reported from not at all (0) to very often (3). A higher score indicates more psychopathology symptoms. The cut-off score for caseness for the Depression Scale is a score of eight or higher (Bjelland, Dahl, Haug, & Neckelmann, 2002). The internal consistency for the Depression Scale is acceptable (α = .79; Spinhoven et al., 1997). In this study, a Cronbach's α of .73 for the Depression Scale was found.

Thirdly, in order to measure the symptoms of mania in the past week, the 5-item Altman Self-Rating Mania Scale (ASRM; Altman, Hedeker, Peterson, & Davis, 1997) was administered. The ASRM provides five response options for each item. By summing up the scores of each item, the total score is calculated. Higher total scores indicate more manic symptoms. The presence of manic symptoms can be indicated by a score of six or higher (Altman et al., 1997). Research has shown a high test-retest reliability (Altman et al., 1997). The Cronbach's α calculated in this study was .73.

Statistical Analyses

Statistical analyses were performed in order to answer the research questions. The statistical package for social sciences version 25 (SPSS) was used to perform the statistical analyses. First of all, nine participants who did not complete the MHC-SF, HADS and ASRM were removed from the dataset. Thereafter, descriptive statistics were used to describe the sample.

In order to answer the first three questions, descriptive statistics were used. For the first question, the mean scores on the total well-being scale of the MHC-SF and the mean scores of the subscales of the MHC-SF were calculated and compared to norm scores based on a representative sample of the general Dutch population (Lamers et al., 2011) with an online t-test (GraphPad QuickCalcs, 2018). Thereafter, the syntax file from the MHC-SF Scoring System (Keyes, 2018) was used to categorize the participants in flourishing, languishing and moderate mental health. In order to answer the second question, the number of participants per mental health category was compared to a representative sample of the general adult Dutch population (Schotanus-Dijkstra et al., 2016) with an online chi-square test (Social Science Statistics, 2018). For the third question, descriptive statistics were used to gain insight into the percentages of the different mental health categories. Descriptive statistics were not supplemented with statistical tests, since this study had a small sample size and the number of participants for each category varied to a large extent.

For answering the fourth, fifth and sixth question, several statistical tests were used. First, a simple linear regression analysis was carried out twice to investigate the univariate relationship between depressive symptoms and well-being and manic symptoms and well-being in order to answer the fourth question. Second, independent samples t-tests were used to check for differences in the level of general well-being and the subscales emotional, social and psychological well-being among people with BD-I and BD-II so the fifth question could be answered. Finally, in order to answer the sixth question two simple linear regression analyses were conducted to check for a potentially significant moderation effect for a model

with interaction and a model without interaction. The variables were centered in order to avoid potentially problematic high multicollinearity with the interaction term (Aiken & West, 1991). Thereafter, an interaction term between depressive symptoms and type of diagnosis and manic symptoms and type of diagnosis was created. Next, two regression analyses with the PROCESS macro 1 (Hayes, 2012) were conducted to test for a moderation effect of type of diagnosis for manic and depressive symptoms and well-being. First, the moderating role of type of diagnosis for the independent variable manic symptoms and the dependent variable well-being was tested. Second, the moderating role of type of diagnosis for the independent variable depressive symptoms and the dependent variable well-being was tested. The moderation effect is statistically significant when the range of the bootstrapped 95% confidence interval around the regression estimate of the interaction term does not contain zero.

Results

Description of the Sample

The sample consisted of 98 participants, 78 females (79.6%) and 20 males (20.4%). The mean age was 52 years (SD = 11.25, range 23–77). 41 participants (41.8%) reported being diagnosed with BD-I, 44 participants (44.9%) reported being diagnosed with BD-II, 12 participants (12.2%) reported the diagnosis ‘unknown’ and 1 participant (2.3%) reported being diagnosed with a cyclothymic disorder. Furthermore, 20 participants (20.4%) scored above the cut-off score for manic symptoms and 67 participants (68.3%) scored above the cut-off score for depressive symptoms. The sample characteristics are presented in Table 1.

Table 1
Descriptives of the Sample (N=98)

Socio-demographics	
Age, *M* (*SD*)	52 (11.3)
Gender, N (%)	
Female	78 (79.6)
Male	20 (20.4)
Marital status, N (%)	
Married	51 (52.0)
Never married	26 (26.5)
Divorced	20 (20.4)
Widowed	1 (1.0)
Employment status, N (%)	
Unable to work	38 (38.8)
Paid work	23 (23.5)
Unpaid/voluntary work	14 (14.3)
Retired	8 (8.2)
Housewife/houseman	4 (4.1)
Self-employed	4 (4.1)
Student	3 (3.1)
Other	4 (4.0)
Education, N (%)	
Low	13 (13.3)
Moderate	30 (30.9)
High	54 (55.6)
Diagnosis, N (%)	
BD-I	41 (41.8)
BD-II	44 (44.9)
Unknown	12 (12.2)
Cyclothymic disorder	1 (2.3)
Relapse into mood episode in past 6 months, N (%)	
Yes	54 (55.1)
No	44 (44.9)
Currently in psychological or psychiatric treatment, N (%)	
Yes	81 (82.7)
No	17 (17.3)
Currently taking medication, N (%)	
Yes	93 (94.9)
No	5 (5.1)
Ever been hospitalized, N (%)	
Yes	6 (6.1)
No	92 (93.9)

Well-being of Participants Compared to General Population

First, the results of the t-tests showed a significant difference in the scores on the total scale of the MHC-SF for the participants in this study (M = 2.12, SD = 1.02) and for a representative sample of the general Dutch population (M = 2.98, SD = 0.85, $t(1758) = 9.6171$, $p < .001$). Similarly, a significant difference in the scores on the subscale emotional well-being was found for the participants (M = 2.49, SD = 1.31) and a representative sample of the general Dutch population (M = 3.67, SD = 0.94, $t(1758) = 11.774$, $p < .001$). On the subscale social well-being was also a significant difference found for the participants (M = 1.69, SD = 0.98) and a representative sample of the general Dutch population (M = 2.33, SD = 1.01, $t(1758) = 6.106$, $p < .001$). Lastly, on the subscale psychological well-being was also a significant difference found for the participants (M = 2.28, SD = 1.20) and a representative sample of the general Dutch population (M = 3.18, SD = 0.99, $t(1758) = 8.634$, $p < .001$).

Participants per Category of Mental Health Compared to General Population

In this sample, 32.7% of the participants were categorized as languishing compared to 1.6% of the individuals in a representative sample of the general adult Dutch population. In the moderate mental health category, 44.9% of the participants were categorized compared to 61.9% of the individuals in a representative sample of the general adult Dutch population. Finally, 14.3% of the participants were categorized as flourishing compared to 36.5% of the individuals in a representative sample of the general adult Dutch population. The results of the chi-square test confirmed a significant difference between the number of individuals in the categories of mental health for the participants in this study and for the representative sample of the general adult Dutch population (X^2 (2, N = 5394) = 483.51, $p < .001$).

Socio-demographics per Category of Mental Health

Descriptive statistics were used to explore the socio-demographics for each category of mental health. The socio-demographics per level of mental health are presented in Table 2.

Table 2
Descriptives per Category of Mental Health

Socio-demographics	**Languishing (n = 32)**	**Moderate mental health (n = 44)**	**Flourishing (n = 14)**
Age, *M* (*SD*)	55.7 (9.7)	52.3 (11.0)	49.7 (14.3)
Gender, n (%)			
Female	27 (84.4)	29 (65.9)	14 (100)
Male	5 (15.6)	15 (34.1)	-
Marital status, n (%)			
Married	17 (53.1)	20 (45.5)	8 (57.1)
Never married	7 (21.9)	12 (27.3)	5 (35.7)
Divorced	8 (25.0)	11 (25.0)	1 (7.1)
Widowed	-	1 (2.3)	-
Employment status, n (%)			
Unable to work	17 (53.1)	17 (38.6)	2 (14.3)
Paid work	3 (9.4)	11 (25.0)	4 (28.6)
Unpaid/voluntary work	7 (21.9)	5 (11.4)	2 (14.3)
Retired	3 (9.4)	3 (6.8)	2 (14.3)
Housewife/houseman	2 (6.3)	2 (4.5)	-
Student	-	1 (2.3)	1 (7.1)
Self-employed	-	3 (6.8)	1 (7.1)
Education, n (%)			
Low	2 (6.3)	1 (2.3)	1 (7.1)
Moderate	8 (25.0)	12 (27.3)	4 (28.6)
High	21 (65.7)	31 (70.4)	9 (64.3)
Diagnosis, n (%)			
BD-I	10 (31.3)	19 (43.2)	8 (57.1)
BD-II	14 (43.8)	21 (47.7)	5 (35.7)
Unknown	8 (25.0)	3 (6.8)	1 (7.1)
Cyclothymic disorder	-	1 (2.3)	-
Relapse into mood episode in past 6 months, n (%)			
Yes	25 (78.1)	20 (45.5)	7 (50.0)
No	7 (21.9)	24 (54.5)	7 (50.0)
Currently in psychological or psychiatric treatment, n (%)			
Yes	28 (87.5)	33 (75.0)	13 (92.9)
No	4 (12.5)	11 (25.0)	1 (7.1)
Currently taking medication, n (%)			
Yes	31 (96.9)	42 (95.5)	14 (100)
No	1 (3.1)	2 (4.5)	-
Ever been hospitalized, n (%)			
Yes	1 (3.1)	3 (6.8)	2 (14.3)
No	31 (96.9)	41 (93.2)	12 (85.7)

In Table 2, it can be noticed that in the category languishing, the percentage of females (84.4%) was higher compared to the percentage of males (15.6%). The same counts for the category moderate mental health which consisted of 65.9% females and 34.1% males. Notable is that in the category flourishers, 100% of the participants were female. These results showed that females were overrepresented in the category languishing as well as in the category flourishing.

Also notable is that mainly languishing appeared to be associated with being unable to work since 53.1% of the languishers was unable to work, compared to 38.6% of the participants in moderate mental health and to only 14.3% of the flourishers. When looking at the percentages of participants who had paid work, flourishing appeared to be associated with having paid work since 28.6% of the flourishers had a paid job, compared to 25.0% of participants in moderate mental health and only 9.4% of the languishers. These results suggests that a less severe mental health category seems to be associated with less impact on occupational functioning.

Looking at relapses into mood episodes in the past 6 months, it is notable that languishing appeared to be associated with a relapse into a mood episode since 78.1% of the languishers had a relapse, compared to 45.5% of the participants in moderate mental health and 50.0% of the flourishers.

Level of Well-being Associated with Depressive and Manic Symptoms

Simple linear regression analysis was conducted twice to investigate the relationship between depressive symptoms and well-being and manic symptoms and well-being. The results indicated that depressive symptoms were significantly predictive of well-being (F (1, 95) = 78.148, p <.001) with an explained variance R^2 = .451. On the other hand, manic symptoms were not significantly predictive of well-being (F (1, 95) = 3.430, p = .067) with an explained variance R^2 = .187.

Difference in the Level of Well-being and Diagnosis

Independent Samples t-tests were conducted to compare the level of well-being in BD-I and BD-II participants. There was no significant difference in the total score on the MHC-SF for well-being in BD-I (M = 2.33, SD = 0.97) and well-being in BD-II (M = 2.12, SD = 1.02) participants *(*t(83) = .96, p = .34). Moreover, similar results were found in the scores on the subscales of the MHC-SF for well-being in BD-I and BD-II participants. On the emotional well-being scale, no significant difference was found in the score in BD-I (M = 2.74, SD = 1.33) and in BD-II (M = 2.46, SD = 1.30) participants (t(83) = .97, p = .33). Also, no significant difference was found in the score on the social well-being scale in BD-I (M = 1.76,

SD = 0.95) and in BD-II (*M* = 1.77, *SD* = 0.98) participants *(t*(83) = -.06, *p* = .95). Finally, no significant difference was found in the score on the psychological well-being scale in BD-I (*M* = 2.60, *SD* = 1.13) and in BD-II (*M* = 2.24, *SD* = 1.19) participants *(t*(83) = 1.41, *p* = .16).

Moderation Effect for Diagnosis for Depressive and Manic Symptoms and Well-being

Two simple moderation analyses were conducted to test whether type of diagnosis moderated the relationship between depressive and manic symptoms and well-being. First of all, two models were tested in which the variables depressive symptoms and type of diagnose were included in the first model and the variables manic symptoms and type of diagnose were included in the second model. In the first model, depressive symptoms and type of diagnose did account for a significant amount of variance in well-being (R^2 = .427, F(2, 82) = 30.51, p < .001). On the other hand, no significant amount of variance in well-being was found for manic symptoms and type of diagnose in the second model (R^2 = .047, F(2, 82) = 2.034, p = .137).

Second, the interaction term between depressive symptoms and type of diagnosis was added to the regression model, which did not account for a significant proportion of the variance in well-being (ΔR^2 = .001, ΔF(1, 81) = .124, b = .015, 95% CI [-.069, .098], t(81) = .352, p = .726). Also, no significant proportion of the variance in well-being was found in the regression model in which the interaction term between manic symptoms and type of diagnosis was added (ΔR^2 = .008, ΔF(1, 81) = .674, b = -.056, 95% CI [-.192, .080], t(81) = -.821, p = .414).

For both regression models, interaction plots were computed. In Figure 1, the interaction plot of the relationship between depressive symptoms and well-being moderated by type of diagnose is displayed and confirms that the association between depressive symptoms and well-being was very similar for both types of diagnosis. Also, Figure 1 suggests no difference between the amount of depressive symptoms for BD-I and BD-II and a similar negative association between depressive symptoms in well-being in both participant groups.

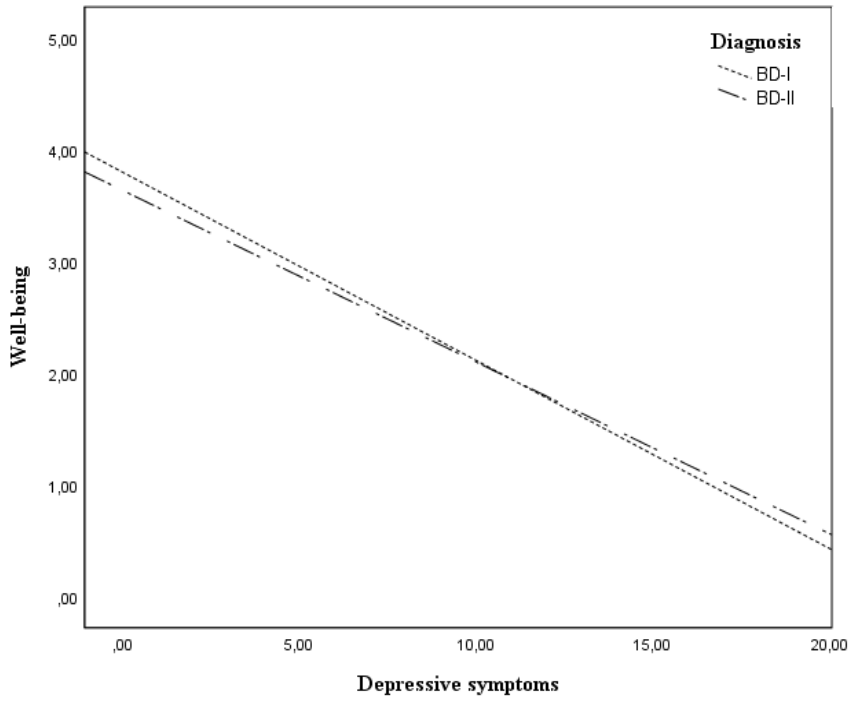

Figure 1. Interaction plot depressive symptoms, well-being and type of diagnosis.

The interaction plot computed for the relationship between manic symptoms and well-being moderated by the type of diagnose is displayed in Figure 2 and suggests a larger positive association between manic symptoms and well-being for BD-I compared to BD-II. However, the interaction was not significant. As can be seen in the figure, participants with BD-I have a higher level of well-being when experiencing more manic symptoms compared to participants with BD-II. Also, Figure 2 shows that participants with BD-I tend to experience more manic symptoms compared to participants with BD-II.

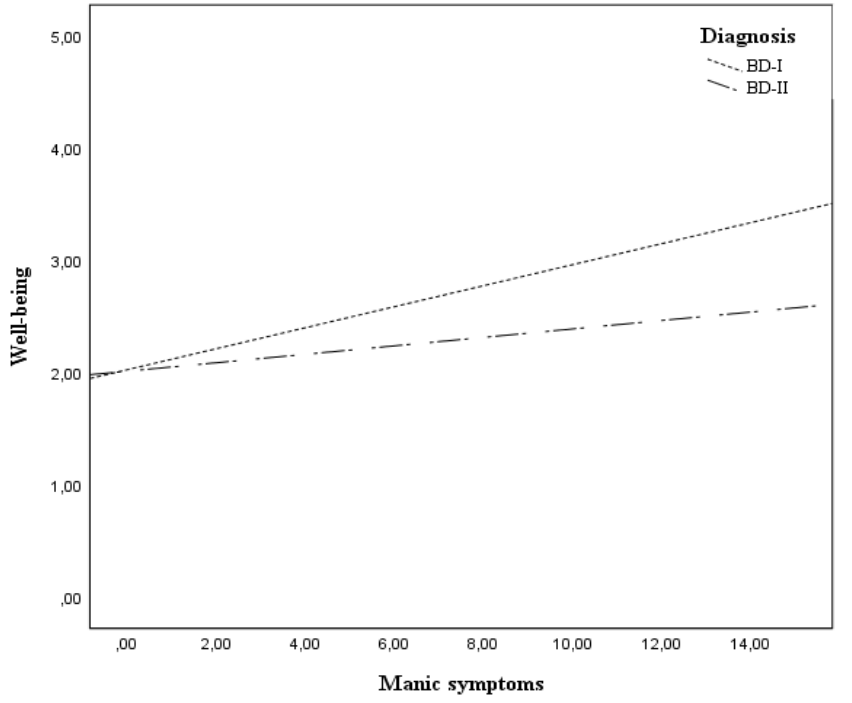

Figure 2. Interaction plot manic symptoms, well-being and type of diagnosis.

Discussion

The aim of this study was to investigate the level of well-being among people with BD, its association with depressive and manic symptoms and the potential moderation by type of BD. It can be concluded that people with BD experienced significant lower levels of well-being compared to a representative sample of the general Dutch population and that the level of well-being did not differ for people with BD-I and BD-II. In addition, most people (44.9%) were in moderate mental health followed by languishing (32.7%) and flourishing (14.3%), which differed significantly from a representative sample of the general Dutch population. Females tended to be overrepresented in as well the category flourishing (100%) as in the category languishing (84.4%) and a less severe mental health category appeared to be associated with less impact on occupational functioning. Finally can be concluded that the level of well-being was associated with depressive symptoms and not with manic symptoms and neither association was moderated by type of diagnosis.

The finding that people with BD experienced lower levels of well-being compared to a representative sample of the general Dutch population is supported by previous research stating that BD is associated with a decreased quality of life (Dean et al., 2004) and has a significant impact on individuals' general functioning (Revicki et al., 2005; Rosa et al., 2010). This was also reflected in the finding that more people with BD were languishing and fewer people with BD were flourishing, compared to a representative sample of the general Dutch population. On the other hand, it is notable that some people with BD actually can flourish, given that over half of the Dutch adults with BD have suicidal ideations and that one fifth of the Dutch adults with BD have made a suicide attempt (ten Have et al., 2002). In addition to this, all flourishers were female, which is in line with other research stating that the female gender is positively related to flourishing in a representative sample of the general Dutch population (Schotanus-Dijkstra et al., 2016). However, this finding has to be interpreted with caution since the subgroup flourishers was relatively small. Contradictory is that females were also overrepresented in the opposite category of flourishing, languishing. It is known that females in general make more extreme responses on a Likert scale than males (Heinemann & Zax, 1968; Zax & Takahashi, 1967), which could explain the overrepresentation of females in opposite mental health categories.

Furthermore, research showed BD is associated with decreased occupational well-being (Revicki et al., 2005; Rosa et al., 2010). This is consistent with the current finding that over half of the languishers were not able to work and that the majority of people who were able to work, were flourishing. The finding that about three quarters of the languishers experienced a

relapse into a mood episode compared to about half of the participants in moderate mental health and in the category flourishing, is consistent with findings about a decreased level of well-being when experiencing depressive and manic symptoms (Kessing et al., 2006; Rosa et al., 2010). This finding is also consistent with previous research showing that lower levels of well-being are a risk factor for experiencing symptoms and that higher levels of well-being can protect individuals from experiencing symptoms (Iasiello et al., 2019; Keyes et al., 2010). This could also give an explanation for the finding that flourishers experienced fewer relapses compared to languishers.

The finding that well-being was associated with depressive symptoms and not with manic symptoms is partly in line with previous research, since the level of psychosocial functioning is more negatively affected by experiencing depressive symptoms compared to (hypo) manic symptoms (Rosa et al., 2010). Also, depression is the predominant mood symptom in BD (Judd et al., 2002; Judd et al., 2003a; Judd et al., 2003b) and depressive symptoms seem to be the strongest predictor of well-being and health in general (Kessing et al., 2006). The finding that manic symptoms were not significantly associated with well-being is hard to explain since less is known about the impact of (hypo) manic symptoms on well-being (Michalak et al., 2008). Nevertheless, it is known that the impact on quality of life and functional impairment is larger when experiencing acute mania and psychotic symptoms compared to hypomanic symptoms (Michalak et al., 2008; Strejilevich et al., 2013). In the current study, one fifth of the participants scored above the cut-off score on the ASRM scale, which indicates that most participants scored low on the ASRM scale. This means that most participants did not experience manic symptoms to a severe extent which could suggest that the impact on well-being was small which caused no significant association. Also, when looking at the p-value, it is notable that the association between manic symptoms and well-being was almost significant. This could be an indication for experiencing manic symptoms just below the threshold in such that it had no significant impact on well-being.

It is notable that there was no significant difference found in the level of well-being between BD-I and BD-II. Beforehand was hypothesized that people with BD-I would experience lower levels of well-being, because it is known that they experience more severe manic symptoms which have a negative impact on the quality of life (Michalak et al., 2008). The ambivalence can be explained by several factors. First of all by the finding that both participant groups scored low on the ASRM scale which suggests that when manic symptoms were experienced to a small extent in both participant groups, the impact on well-being was low for both participant groups leading to no differences in the levels of well-being for both

participant groups. Second, the participants were patient members of the Dutch patient association for BD and were enrolled based on self-selection. Given this, there is a possibility of self-selection bias (Heckman, 1990) in such way that less-functioning people were not as likely to participate compared to well-functioning people (Søgaard, Selmer, Bjertness, & Thelle, 2004). This could suggest that merely people with BD participated who did not experience symptoms to a severe extent which could lead to a smaller impact on well-being. Third, a limitation of this study was that participants reported their diagnosis by themselves, which leaves the possibility that not all participants reported a clinically confirmed diagnosis or reported an incorrect type of BD.

Also notable is that there was no significant moderation effect found for type of diagnosis for the relationship between depressive and manic symptoms and well-being. This suggests that type of BD does not change the relationship between symptoms and well-being. However, there was a tendency of a positive association between well-being and manic symptoms for particularly people with BD-I, which suggested that experiencing more manic symptoms increased the level of well-being for people with BD-I. This finding was unexpected, especially since BD-I is characterized by more severe manic symptoms compared to BD-II and more severe manic symptoms are associated with a decreased quality of life (Michalak et al., 2008). So far, no possible explanations were found and it remains unclear why there appeared to be a positive association between manic symptoms and well-being for people with BD-I.

Finally, the finding of no significant moderation effect of type of diagnosis for manic symptoms and well-being can be explained by another limitation of this study, namely a relatively small sample size. Research showed that in order to detect an interaction effect at the recommended level of .80 for statistical power (Cohen, 1992), four times as many participants are required (Leon & Heo, 2009). This means that about 400 participants were required in the sample to find a significant moderation effect. The limitation of a small sample size also precluded that statistical tests could be performed to test for differences in socio-demographics of people with BD for the mental health categories, since the number of participants was small and not equally distributed among the mental health categories.

Another limitation is that this study had a cross sectional design in which data of participants was obtained at a single point in time (Mann, 2003; Sedgwick, 2014). In this study, the standardized questionnaires were administered to the participants once, which made it difficult to infer any temporal associations between symptoms and well-being. Therefore, it was hard to determine the direction of the effects. This precluded that conclusions about

causality could be drawn, meaning that only conclusions about associations could be drawn from this study (Mann, 2003; Sedgwick, 2014).

Taking into account the limitations of this study, several recommendations for future research can be drawn. Future research should explore the relationship between BD symptoms and well-being in a longitudinal design by including a large sample size and by using a clinically confirmed diagnosis. Also, future research should more robustly test the differences in socio-demographics of people with BD for the mental health categories with statistical tests, when the number of participants is larger and equally distributed among the categories.

Furthermore, implications for treatment of people with BD related to improving well-being can be drawn from this study. People with BD seem to be a vulnerable group with recurring symptoms and BD seems to be associated with an increased risk of suicide (Pompili et al., 2013; ten Have et al., 2002). It is important to increase well-being in this group since well-being can protect against symptoms and relapses (Iasiello et al., 2019; Keyes et al., 2010). Also, previous research showed that Well-Being Therapy (WBT) combined with Cognitive Behavioral Therapy (CBT) was beneficial for people with cyclothymic and anxiety disorders (Fava, Rafanelli, Tomba, Guidi, & Grandi, 2011; Fava et al., 2005). The current research showed that well-being is not moderated by type of diagnosis, which implies that the different types of BD do not have to be taken into account when promoting, applying and evaluating interventions to improve well-being, such as WBT. This means that people with BD-I and BD-II could receive the same interventions in WBT. This implication is also useful for research in which interventions are developed to improve well-being among people with BD, such as a positive psychological intervention development by Kraiss and colleagues (2018) in which possible working mechanisms for interventions are explored.

This is the first explorative study aimed at investigating well-being among people with BD. It turned out that people with BD experienced lower levels of well-being compared to the general Dutch population and the level of well-being was only associated with depressive symptoms. Moreover, most people experienced moderate mental health and a small group of people was even flourishing. Since flourishing and improvement of well-being can protect against the recurrence of symptoms of mental illness (Iasiello et al., 2019; Keyes et al., 2010), it is important to develop interventions to improve well-being among people with BD. Since this study has shown that level of well-being did not differ for type of diagnosis and that diagnosis did not change the relationship between depressive and manic symptoms and the level of well-being, it can be concluded that people with BD-I and BD-II could receive the same interventions for improving well-being.

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