Self-Compassion Mediates the Relationship Between Mindfulness and Borderline Personality Disorder Symptoms

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SELF-COMPASSION MEDIATES THE RELATIONSHIP BETWEEN MINDFULNESS AND BORDERLINE PERSONALITY DISORDER SYMPTOMS

Hannah J. Scheibner, PhD, Anna Daniels, BSc, Simon Guendelman, MD, Franca Utz, BSc, and Felix Bermpohl, MD

Individuals suffering from borderline personality disorder (BPD) experience difficulties with mindfulness. How mindfulness influences BPD symptoms, however, is still unknown. We hypothesized that the relationship between mindfulness and BPD symptoms would be mediated by self-compassion. In study 1, we recruited 29 individuals with BPD and 30 group-matched healthy controls. In study 2, we complemented our results with findings from a larger, nonclinical sample of 89 participants that were recruited during an open-house event at the local university. All participants completed questionnaires assessing self-compassion, mindfulness, BPD symptom severity, and emotion dysregulation. In both studies, self-compassion mediated the relationship between mindfulness and BPD symptom severity as well as between mindfulness and emotion dysregulation. Self-compassion seems to be one psychological process that could explain the relationship between mindfulness and BPD symptoms. One promising approach in therapy could be to target self-compassion more directly during mindfulness trainings and interventions.

Borderline personality disorder (BPD) is a complex, severe mental illness characterized by pervasive patterns of instability in emotion regulation, impulse control, interpersonal relationships, and self-image (Leichsenring, Leibing, Kruse, New, & Leweke, 2011; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Skodol et al., 2002). Recent studies showed that BPD symptom severity was associated with self-reported difficulties in mindfulness (Baer, Smith, & Allen, 2004; Scheibner, Spengler, Kanske, Roepke, & Bermpohl, 2016; Wupperman, Neumann, & Axelrod, 2008). Mindfulness is a concept derived from Buddhist tradition and has been defined in modern Western psychology as nonjudgmental attention to and awareness of the present moment (Kabat-Zinn, 1994). Mindfulness stands in contrast to several key
symptoms of individuals with BPD, for example, their difficulty to pay attention to and be aware of their own feelings and emotions (Bijttebier & Vertommen, 1999; Leible & Snell, 2004; Levine, Marziali, & Hood, 1997; Yen, Zlotnik, & Costello, 2002). Consequently, mindfulness exercises are a central mean in the treatment of BPD (Miller, Wyman, Huppert, Glassman, & Rathus, 2000; Stepp, Epler, Jahng, & Trull, 2008), especially in Dialectical Behavioral Therapy (DBT; Linehan, 1993). Some first evidence suggests that mindfulness exercises improve BPD symptoms, in particular emotion regulation (Perroud, Nicastro, Jermann, & Huguelet, 2012; Sauer & Baer, 2012). However, the psychological processes through which mindfulness is associated with reduced BPD symptoms are still largely unknown. Here, we argue that the relationship between mindfulness and BPD symptoms is mediated by self-compassion.

Self-compassion is defined as an attitude of kindness toward oneself in face of crisis, that acknowledges one’s own emotions without overly identifying with them and sees imperfection as part of being human (Neff, 2003a). Self-compassion consistently displayed positive relationships with psychological well-being and negative relationships with psychopathology in past research (MacBeth & Gumley, 2012; Zessin, Dickhäuser, & Garbade, 2015). In Buddhist tradition, mindfulness has beneficial effects only if it improves some form of acceptance and compassion (Gilpin, 2008; Rosch, 2007; Salzberg, 2003). Similarly, in Western psychology, self-compassion has been conceptualized as an outcome of mindfulness practice (e.g., Bishop et al., 2004; Brown, Ryan, & Creswell, 2007). A state of mindful awareness when suffering allows oneself to acknowledge one’s pain in the first place without judgment. Then, feelings of self-kindness and common humanity can arise to actively soothe the self (Neff & Dahm, 2015). These views are supported by studies showing that increases in mindfulness predict increases in self-compassion (Birnie, Speca, & Carlson, 2010; Shapiro, Brown, & Biegel, 2007). Further, in a longitudinal study with non-clinical samples, mindfulness precipitated self-compassion, but not vice versa (Bergen-Cico & Cheon, 2014). Moreover, a growing number of studies on the effects of mindfulness-based training programs demonstrated increases in self-compassion (Bergen-Cico & Cheon, 2014; Birnie et al., 2010; Rimes & Wingrove, 2012; Robins, Keng, Ekblad, & Brantley, 2012; Shapiro, Astin, Bishop, & Cordova, 2005). Further studies showed that mindfulness-induced changes in self-compassion mediated decreases in stress (Shapiro et al., 2007), depressive symptoms (Kuyken et al., 2010), worry, and fear of emotion (Keng, Smoski, Robins, Ekblad, & Brantley, 2012), as well as increases in well-being (Baer, Lykins, & Peters, 2012). In their review on mechanisms of mindfulness meditation, Hölzel et al. (2011) argue that self-compassion works as an emotion regulation strategy, as it teaches how to cope in instances of pain and suffering. At the same time, individuals with BPD commonly experience severe self-criticism and difficulties in emotion regulation, contrary to mindful and self-compassionate attitudes, that likely lead to anger and self-harm (Krawitz, 2012; Linehan, 1993; Warren, 2015). In sum, self-compassion has been proposed to mediate the relationship between mindfulness and well-being, and seems to target symptoms central to BPD.
To the best of our knowledge, no study to date has examined the role of self-compassion in the relationship between mindfulness and BPD symptoms in samples of individuals with BPD as well as healthy controls. Preliminary evidence stems from a study by Perroud et al. (2012) that assessed BPD patients’ mindfulness skills during and after DBT therapy. Patients only significantly improved on one of four discrete mindfulness dimensions: acceptance without judgment. Acceptance without judgment in turn predicted treatment success. These results suggest that a kind, accepting attitude—similar to self-compassion—had a major impact on the treatment success of BPD. Further preliminary support of an inverse relationship between BPD and self-compassion stems from a study which investigated mindfulness, self-compassion, and BPD in a nonclinical sample (Rivera, 2013). Not only were self-compassion deficits related to increased BPD symptoms, but self-compassion also fully accounted for the relationship between mindfulness and BPD symptom characteristics. However, as the researchers in the above-mentioned studies either did not assess self-compassion directly (Perroud et al., 2012) or did not compare its effects between clinical and nonclinical samples (Rivera, 2013), further evidence is needed.

We here argue that self-compassion explains the relationship between mindfulness and BPD, because self-compassion is a result of mindfulness training and helps individuals with BPD to build a kind attitude towards their emotions and towards themselves. We tested a model in which mindfulness predicts BPD symptoms, and this relationship is mediated through self-compassion. This model was based on previous literature that demonstrated beneficial effects of mindfulness on BPD symptoms (Perroud et al., 2012; Sauer & Baer, 2012), and the mediating role of self-compassion in mindfulness training (Baer et al., 2012; Keng et al., 2012; Kuyken et al., 2010; Shapiro et al., 2007). Since our study was cross-sectional, we cannot draw conclusions about the directionality of the relationship between mindfulness and BPD, and BPD symptoms could equally predict mindfulness, mediated through self-compassion. In study 1 we collected data from a BPD patient group and a healthy control group. In study 2 we aimed to complement our results with findings from a larger, more heterogeneous sample of participants from the general population. Based on previous research with these variables in patients with BPD (Feliu-Soler et al., 2017) or healthy controls (Rivera, 2013), we included a sample of healthy participants to investigate whether the relationship between self-compassion, mindfulness, and emotion regulation holds true at different (i.e., healthy, subclinical, and clinical) levels of emotional distress. For this purpose, we operationalized BPD as a continuous measure (Widiger, 1992). General severity of present BPD symptoms as measured by the Borderline Symptom List (BSL-23; Bohus et al., 2009) and current levels of emotion dysregulation as measured by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) were assessed as indicators of BPD symptoms. We also chose emotion dysregulation as an indicator of BPD in line with Linehan’s biosocial theory of BPD, which postulates emotion dysregulation to be the core symptom of this disorder (Linehan, 1993; Linehan, Bohus, & Lynch, 2007).

The hypotheses were as follows:
Hypothesis 1: In individuals with BPD and a healthy control group, self-compassion mediates the effect of mindfulness on BPD symptom severity (model 1) and emotion dysregulation (model 2).

Hypothesis 2: In a representative sample from the general population, self-compassion mediates the effect of mindfulness on BPD symptom severity (model 1) and emotion dysregulation (model 2).

STUDY 1: SELF-COMPASSION AS A MEDIATOR IN INDIVIDUALS WITH BPD AND HEALTHY CONTROLS

METHOD

Study 1 was embedded in a larger behavioral study (Scheibner et al., 2016) that aimed at identifying mindfulness deficits in BPD using a behavioral task. The study design was reviewed by the local ethical committee and the investigation was carried out in accordance with the latest version of the declaration of Helsinki. Informed consent of the participants was obtained prior to participation and after the nature of the procedures had been fully explained.

Participants

Twenty-nine individuals with BPD and 30 healthy controls participated in the current study. Group membership was established using the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (First, Gibbon, Williams, & Benjamin, 1997; Wittchen, Zaudig, & Fydrich, 1997) module for BPD. Participants were screened for comorbidity using the Structured Clinical Interview for DSM-IV Axis I and II (First, Gibbon et al., 1997; First, Williams, & Gibbon, 1997; Wittchen et al., 1997) and the Mini-International Neuropsychiatric Interview (Ackenheil, Stotz, Dietz-Bauer, & Vossen, 1999; Sheehan & Lecrubier, 1998). Three trained clinical psychologists administered all clinical interviews. To ensure reliability of the diagnosis, two psychologists were present during the diagnostic interview and afterwards compared their diagnosis.

Participants in the group of individuals with BPD had to meet five or more criteria for BPD. To prevent confounding effects of psychiatric comorbidity, psychotic symptoms and diagnosis of bipolar disorder were exclusion criteria. Further exclusion criteria for this group were current high suicidal tendency, organic brain damage, and very low intellectual ability (IQ < 70). One BPD patient was excluded from the data analysis because the patient did not adhere to the instructions given in the questionnaires (\(n = 1\)). The remaining 28 individuals with BPD (23 females, 82.1%) ranged in age from 23 to 59 years with a mean age of 35.82 years (SD = 9.65). The majority of individuals with BPD (53.6%) had acquired a general certificate of secondary education (German Abitur). Ten participants with BPD reported that they were taking antidepressant medication (\(n = 4\) SSRI, \(n = 2\) SSNRI, and \(n = 4\) not specified), one quetiapine, and one pregabalin. One participant occasionally used promethazine and two hypnotic medications; those on-demand medications were not taken during the last 24 hours prior to testing.
Participants in the group of healthy controls had no current mental or personality disorder and no history of depression or post-traumatic stress disorder. This group consisted of 30 participants who were recruited by online advertisement and group-matched for sex (22 females, 73.3%), age ($M = 34.43, SD = 12.08$), and highest level of scholarly education (53.3% of the healthy controls had Abitur) with the respective characteristics of the individuals with BPD. Individuals with BPD and healthy controls did not differ significantly on sex ratio, age, or education level (see Table 1). Participants in both groups reported little to no previous history with mindfulness training or meditation, and individuals with BPD reported little to no experience with DBT.

Measures

Self-compassion was measured using the widely employed 26-item Self-Compassion Scale (SCS; Neff, 2003b) in its German version (Hupfeld & Ruffieux, 2011). The SCS consists of three bipolar subscales. These represent Neff's (2003a, 2003b) postulated three components of self-compassion: self-kindness (e.g., I'm tolerant of my own flaws and inadequacies) versus self-judgment (e.g., When times are really difficult, I tend to be tough on myself), common humanity (e.g., I try to see my failings as part of the human condition) versus isolation (e.g., When I'm feeling down I tend to feel like most other people are probably happier than I am), and mindfulness (e.g., When I...
fail at something important to me I try to keep things in perspective) versus over-identification (e.g., When something upsets me I get carried away with my feelings). Respondents self-report their behaviors on a five-point Likert scale from 1 (almost never) to 5 (almost always).

Please note that the definition of mindfulness used in the SCS differs from the conceptualization of mindfulness by Kabat-Zinn (1994), which is adopted in the present study. Mindfulness in the sense of self-compassion specifically refers to maintaining perspective in challenging circumstances in order to soothe the self (Neff & Dahm, 2015).

Mindfulness was assessed using the 14-item short form of the Freiburger Fragebogen zur Achtsamkeit (Freiburg mindfulness inventory) in its German version (FFA; Buchheld, Grossmann, & Walach, 2001; Walach et al., 2004). Participants self-rate their subjective experience of mindfulness in everyday life (e.g., When I notice an absence of mind, I gently return to the experience of the here and now) on a four-point Likert scale from 1 (rarely) to 4 (almost always). The short version was shown to be a robust and valid instrument in general and clinical populations. The administration of the short version of the FFA is suitable in samples without any knowledge of Buddhist psychology (Walach et al., 2004).

In order to assess BPD-typical symptoms, the short form of the Borderline Symptom List was utilized in its German version (BSL-23; Bohus et al., 2009). The BSL-23 consists of 23 items (e.g., I wanted to punish myself or My mood rapidly cycled in terms of anxiety, anger and depression). Participants self-rate how much they suffered from each problem in the course of the previous week on a five-point Likert scale from 0 (not at all) to 4 (very strong).

Emotion dysregulation was operationalized through the 36-item Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) in its German translation (Ehring, Tuschen-Caffier, Griepenstroh, & Berking, 2010). The DERS assesses individuals’ typical levels of emotion dysregulation. Sample items include: “When I’m upset, I feel guilty for feeling that way” or “I know exactly how I am feeling.” Items are self-rated on a five-point Likert scale from 1 (almost never) to 5 (almost always).

Procedure

After successful recruitment, a questionnaire packet (containing the SCS and the DERS) was sent to the participants’ homes in order to reduce assessment time. Participants were instructed to fill out the questionnaire by themselves and in a non-distracting environment. The remaining measures (i.e., the FFA and the BSL-23) were completed on the day of the study. Participants were continuously encouraged to ask questions if anything was not clear. At study completion, participants received monetary reimbursement for their effort.

Statistical Analyses

All analyses were conducted using SPSS statistics 21.0 software package for Windows and all hypotheses were tested at a one-sided significance level
TABLE 2. Inter-correlations for Main Variables in Each Group (Study 1 and Study 2)

<table>
<thead>
<tr>
<th></th>
<th>BPD (n = 28)</th>
<th></th>
<th>HC 1 (n = 30)</th>
<th></th>
<th>HC 2 (n = 86)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1 SCS</td>
<td>.72**</td>
<td>-.56**</td>
<td>-.49**</td>
<td>.55**</td>
<td>-.60**</td>
</tr>
<tr>
<td>2 FFA</td>
<td>-.50**</td>
<td>-.37*</td>
<td>-.32*a</td>
<td>-.44**</td>
<td>-.54**</td>
</tr>
<tr>
<td>3 BSL-23</td>
<td>.34*</td>
<td>.33*a</td>
<td>.72***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 DERS</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. SCS = Self-Compassion Scale; FFA = Freiburger Fragebogen zur Achtsamkeit (Freiburg mindfulness inventory); BSL-23 = Borderline Symptom List 23; DERS = Difficulties in Emotion Regulation Scale. BPD = group of individuals with BPD; HC 1 = group of healthy controls in study 1; HC 2 = group of healthy controls in study 2. The significance was tested one-sidedly. *Spearman’s $r$ is reported as data were not normally distributed for the BSL-23 in both groups of healthy controls and thus assumptions of Pearson’s $r$ were violated (Field, 2009). *$p < .05$. **$p < .01$. of $\alpha = .05$, unless otherwise specified. Mediation analyses were performed using bootstrapping methods in the PROCESS SPSS macro (Hayes, 2013). This macro represents the state of the art in mediation analysis, which is to formally test the significance of the indirect effect of the independent variable on the dependent variable by the mediating variable (Hayes, 2009; Zhao, Lynch, & Chen, 2010). For the analysis at hand, non-parametric bootstrapping with bias-corrected bootstrap 95% confidence intervals based on 5,000 bootstrap samples was utilized. If zero was not contained within the bounds of the confidence interval, there existed an indirect effect unequal zero in the population with a probability of 95%. This category of mediation analysis makes no assumptions about the sampling distribution of the indirect effect and is appropriate for small samples (Hayes, 2009; Preacher & Hayes, 2004).

In order to examine the hypothesized interplay between mindfulness, BPD symptoms, and self-compassion, mindfulness was entered as the independent variable, the respective indicators of BPD symptoms as the dependent variables, and self-compassion as the mediating variable (see Figure 1). In other words, this model tested the hypothesis that the association between mindfulness and BPD was mediated by self-compassion. Effect size was estimated with $\hat{k}^2$, which is the ratio of the obtained indirect effect to the maximum possible indirect effect given the present study design and data. This effect size was chosen, as it is standardized and bounded, facilitating interpretation. Further, it is insensitive to sample size and allows for the construction of bootstrap confidence intervals (Preacher & Kelley, 2011).

RESULTS

Zero-order correlations for the variables used in the main analyses in both groups are shown in Table 2. Results of all conducted mediation analyses are summarized in Tables 3 and 4. As correlations were high between the SCS and the FFA in both groups, multicollinearity measures, namely, the tolerance factor (TOL) and the variance inflation factor (VIF) were checked (BPD: TOL = 0.49, VIF = 2.05; HC 1: TOL = 0.70, VIF = 1.43) and did not exceed critical values (TOL < 0.1, VIF > 10; Eid, Gollwitzer, & Schmitt, 2013; Field, 2009).
**BPD Symptom Severity as Dependent Variable (Model 1).** The first model tested whether the effect of mindfulness on reduced BPD symptom severity functions through high levels of self-compassion. There was a significant total effect of mindfulness on BPD symptom severity in the group of individuals with BPD, but not in the group of healthy controls. When self-compassion was added to the model, the direct effect of mindfulness on BPD symptom severity no longer reached a level of statistical significance in the group of individuals with BPD and was also nonsignificant in the group of healthy controls. There was a significant indirect effect \( a \times b \) of mindfulness on BPD symptom severity through self-compassion in each group. The effect sizes \( \hat{k}^2 = .24 \) (bootstrap 95% CI [.04, .45]) and \( \hat{k}^2 = .22 \) (bootstrap 95% CI [.07, .42]), respectively. They denote that 24% (22%, respectively) of the maximum possible indirect effect was obtained.

**Emotion Dysregulation as Dependent Variable (Model 2).** The second model tested whether the association between mindfulness and reduced emotion dysregulation is mediated by self-compassion. The total effect of mindfulness on emotion dysregulation was not significant in the group of individuals with BPD, but reached significance in the group of healthy controls. When self-compassion was entered into the model, the direct effect of mindfulness on emotion dysregulation was neither significant in the group of individuals with BPD nor in the group of healthy controls. Again, there was a significant indirect effect \( a \times b \) of mindfulness on emotion dysregulation through self-compassion in each group. The effect sizes were \( \hat{k}^2 = .26 \) (bootstrap 95% CI [.04, .57]) and \( \hat{k}^2 = .27 \) (bootstrap 95% CI [.10, .47]), respectively.
### TABLE 3. Mediation Analyses in the Group of n = 28 Individuals With BPD (Study 1)

<table>
<thead>
<tr>
<th>Path</th>
<th>Total and direct effects</th>
<th>Indirect effects</th>
<th>Bootstrap coeff.</th>
<th>SE</th>
<th>95% CI</th>
<th>Stand. coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>SE</td>
<td>p</td>
<td>Coeff.</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>(1) FFA – SCS – BSL-23</td>
<td>.24</td>
<td></td>
<td></td>
<td>a × b</td>
<td>−.51</td>
<td>0.27</td>
</tr>
<tr>
<td>a</td>
<td>6.97</td>
<td>1.34</td>
<td>&lt;.0001</td>
<td>a × b</td>
<td>−.51</td>
<td>0.27</td>
</tr>
<tr>
<td>b</td>
<td>−0.07</td>
<td>0.04</td>
<td>.09</td>
<td>a × b</td>
<td>−.51</td>
<td>0.27</td>
</tr>
<tr>
<td>c</td>
<td>−.86</td>
<td>0.29</td>
<td>.01</td>
<td>a × b</td>
<td>−.51</td>
<td>0.27</td>
</tr>
<tr>
<td>c’</td>
<td>−.35</td>
<td>0.40</td>
<td>.39</td>
<td>a × b</td>
<td>−.51</td>
<td>0.27</td>
</tr>
<tr>
<td>(2) FFA – SCS – DERS</td>
<td>.26</td>
<td></td>
<td></td>
<td>a × b</td>
<td>−.51</td>
<td>0.31</td>
</tr>
<tr>
<td>a</td>
<td>6.97</td>
<td>1.34</td>
<td>&lt;.0001</td>
<td>a × b</td>
<td>−.51</td>
<td>0.31</td>
</tr>
<tr>
<td>b</td>
<td>−0.07</td>
<td>0.04</td>
<td>.07</td>
<td>a × b</td>
<td>−.51</td>
<td>0.31</td>
</tr>
<tr>
<td>c</td>
<td>−.55</td>
<td>0.28</td>
<td>.06</td>
<td>a × b</td>
<td>−.51</td>
<td>0.31</td>
</tr>
<tr>
<td>c’</td>
<td>−.04</td>
<td>0.38</td>
<td>.92</td>
<td>a × b</td>
<td>−.51</td>
<td>0.31</td>
</tr>
</tbody>
</table>

**Note.** FFA = Freiburger Fragebogen zur Achtsamkeit; SCS = Self-Compassion Scale; BSL-23 = Borderline Symptom List short form; DERS = Difficulties in Emotion Regulation Scale.

### TABLE 4. Mediation Analyses in the Group of n = 30 Healthy Controls (Study 1)

<table>
<thead>
<tr>
<th>Path</th>
<th>Total and direct effects</th>
<th>Indirect effects</th>
<th>Bootstrap coeff.</th>
<th>SE</th>
<th>95% CI</th>
<th>Stand. coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>SE</td>
<td>p</td>
<td>Coeff.</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>(1) FFA – SCS – BSL-23</td>
<td>.22</td>
<td></td>
<td></td>
<td>a × b</td>
<td>−.10</td>
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<tr>
<td>a</td>
<td>4.52</td>
<td>1.30</td>
<td>&lt;.01</td>
<td>a × b</td>
<td>−.10</td>
<td>0.05</td>
</tr>
<tr>
<td>b</td>
<td>−0.02</td>
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<td>&lt;.05</td>
<td>a × b</td>
<td>−.10</td>
<td>0.05</td>
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<tr>
<td>c</td>
<td>−0.12</td>
<td>0.07</td>
<td>.12</td>
<td>a × b</td>
<td>−.10</td>
<td>0.05</td>
</tr>
<tr>
<td>c’</td>
<td>−.02</td>
<td>0.08</td>
<td>.85</td>
<td>a × b</td>
<td>−.10</td>
<td>0.05</td>
</tr>
<tr>
<td>(2) FFA – SCS – DERS</td>
<td>.27</td>
<td></td>
<td></td>
<td>a × b</td>
<td>−.34</td>
<td>0.14</td>
</tr>
<tr>
<td>a</td>
<td>4.52</td>
<td>1.30</td>
<td>&lt;.01</td>
<td>a × b</td>
<td>−.34</td>
<td>0.14</td>
</tr>
<tr>
<td>b</td>
<td>−0.08</td>
<td>0.03</td>
<td>&lt;.01</td>
<td>a × b</td>
<td>−.34</td>
<td>0.14</td>
</tr>
<tr>
<td>c</td>
<td>−0.53</td>
<td>0.21</td>
<td>&lt;.05</td>
<td>a × b</td>
<td>−.34</td>
<td>0.14</td>
</tr>
<tr>
<td>c’</td>
<td>−.19</td>
<td>0.22</td>
<td>.41</td>
<td>a × b</td>
<td>−.34</td>
<td>0.14</td>
</tr>
</tbody>
</table>

**Note.** FFA = Freiburger Fragebogen zur Achtsamkeit; SCS = Self-Compassion Scale; BSL-23 = Borderline Symptom List short form; DERS = Difficulties in Emotion Regulation Scale.
DISCUSSION

In both models, these combinations of significant and nonsignificant effects are labeled “indirect-only mediation” by Zhao et al. (2010, p. 201). The total effect of mindfulness on indicators of BPD symptoms is reduced by including self-compassion as a mediator. Moreover, this pattern of effects shows that omitted mediators are unlikely. Ergo, the indirect path from mindfulness to indicators of BPD symptoms via self-compassion is consistent with the hypothesized theoretical framework in which mindfulness is associated with higher levels of self-compassion, which in turn is associated with lower levels of indicators of BPD symptoms. We further conducted post hoc power analyses with the program G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) to assure that the insignificant direct effect could not be attributed to a lack of statistical power. Power analyses were calculated with \( \alpha = .05 \), the respective sample sizes, and the effect sizes which were estimated from the respective squared multiple correlation (model 1: estimated \( \rho^2 = .33 \) in group of BPD patients, estimated \( \rho^2 = .25 \) in group of healthy controls; model 2: estimated \( \rho^2 = .24 \) in group of BPD patients, estimated \( \rho^2 = .38 \) in group of healthy controls). The power was greater than .70 in all four analyses (model 1: \( 1-\beta = .89 \) in group of BPD patients, \( 1-\beta = .71 \) in group of healthy controls; model 2: \( 1-\beta = .72 \) in group of BPD patients, \( 1-\beta = .96 \) in group of healthy controls).

In sum, the models with mindfulness as the independent variable, self-compassion as the mediating variable, and BPD symptom severity or emotion dysregulation as the dependent variable fitted the data in both groups. We can conclude that self-compassion plays a role in the relationship between mindfulness and the severity of BPD-typical symptoms, and this effect can be detected in individuals with BPD as well as healthy participants, controlling for sex, age, and education. Although this study is the first to examine the interplay between mindfulness, self-compassion, and BPD symptoms, the most important limitation is the small size of the samples.

STUDY 2: SELF-COMPASSION AS A MEDIATOR IN A REPRESENTATIVE SAMPLE

In study 2 we tested whether self-compassion mediates the relationship between mindfulness and reduced BPD symptom severity and emotion dysregulation in the general population. For this purpose, we analyzed the mediation models in a larger sample of participants. The study design was reviewed by the local ethical committee and the investigation was carried out in accordance with the latest version of the declaration of Helsinki. Informed consent of the participants was obtained prior to participation and after the nature of the procedures had been fully explained.
METHOD

Participants

Eighty-nine participants were part of the second study. To achieve a wide range of symptoms and traits, participants were only required to be 18 years or older and to exhibit sufficient German language skills. Three participants were excluded from analysis, as they failed to fill out the SCS ($n = 1$) or the BSL-23 ($n = 2$). The remaining 86 participants ranged in age from 18 to 65, with a mean age of $M = 32.71$ ($SD = 12.58$). Data on the sex item was missing for $n = 19$. For reported gender, the proportion was almost equal (35 females, 40.7%, and 32 males, 37.2%). The majority of participants (75.6%) had acquired a general certificate of secondary education (German Abitur). Participants reported how much previous experience they had with mindfulness and mindfulness-related practices on a scale from 1 (not at all) to 4 (advanced). Participants reported most experience with general relaxation techniques ($M = 2.2$, $SD = 0.86$), followed by yoga ($M = 1.93$, $SD = 0.94$), meditation ($M = 1.82$, $SD = 0.98$), muscle relaxation ($M = 1.8$, $SD = 0.89$), and mindfulness ($M = 1.42$, $SD = 0.56$). For more demographic data and group comparisons with the samples from study 1, see Table 1.

Measures

See Study 1.

Procedure

The study took place during an open house event at the local university. Visitors of the event were asked to participate in the study in return for sweets. Participants filled out the demographics questionnaire, the SCS, the FFA, the BSL-23, and the DERS. On the last page we asked participants: “Have you answered all questions honestly? If your answer is 'no' we will still send you an evaluation of your results. You would however greatly help our scientific interpretation of the data if you answered this last question.” All participants answered the last question with “yes” and were thus included in the study. Since the purpose of the open house event was to educate visitors about psychology, they received a feedback on their results. The feedback was carefully phrased, for example, high BSL-23 scores were described as “You often experience strong emotions. This can be overwhelming sometimes.”, and it was explicitly mentioned that the evaluation should not be considered a clinical diagnosis.

Statistical Analyses

See Study 1.

RESULTS

Means, standard deviations, zero-order correlations, and reliabilities for all main variables are displayed in Tables 1 and 2. The results of the mediation
TABLE 5. Mediation Analyses in the Representative Sample of n = 86 From the General Population (Study 2)

<table>
<thead>
<tr>
<th>Path</th>
<th>Coeff.</th>
<th>SE</th>
<th>p</th>
<th>Bootstrap coeff.</th>
<th>SE</th>
<th>95% CI</th>
<th>Stand. coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) FFA – SCS – BSL-23</td>
<td>.20</td>
<td>a</td>
<td>7.21</td>
<td>0.83 &lt; .0001</td>
<td>a × b</td>
<td>−0.28</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b</td>
<td>−0.04</td>
<td>0.01 &lt; .01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c</td>
<td>−0.59</td>
<td>0.11 &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c'</td>
<td>−0.31</td>
<td>0.15 &lt; .05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) FFA – SCS – DERS</td>
<td>.36</td>
<td>a</td>
<td>7.21</td>
<td>0.83 &lt; .0001</td>
<td>a × b</td>
<td>−0.52</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b</td>
<td>−0.07</td>
<td>0.01 &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c</td>
<td>−1.10</td>
<td>0.11 &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c'</td>
<td>−0.58</td>
<td>0.13 &lt; .0001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. FFA = Freiburger Fragebogen zur Achtsamkeit; SCS = Self-Compassion Scale; BSL-23 = Borderline Symptom List short form; DERS = Difficulties in Emotion Regulation Scale.
analyses are summarized in Table 5. Again, as correlations were high between the SCS and the FFA, multicollinearity measures were checked (TOL = 0.53, VIF = 1.89) and did not exceed critical values (TOL < 0.1, VIF > 10; Eid et al., 2013; Field, 2009).

**BPD Symptom Severity as Dependent Variable (Model 1).** The first model tested whether the effect of mindfulness on reduced BPD symptom severity functions through high levels of self-compassion. There was a significant total effect of mindfulness on BPD symptom severity. When self-compassion was included into the model, the direct effect was reduced, but maintained significance. The indirect effect $a \times b$ of mindfulness on BPD symptom severity via self-compassion was also significant. The effect size was $\hat{\kappa}^2 = .20$ (bootstrap 95% CI [.10, .31]).

**Emotion Dysregulation as Dependent Variable (Model 2).** The second model tested whether the effect of mindfulness on reduced emotion dysregulation functions through high levels of self-compassion. There was a significant total effect of mindfulness on emotion dysregulation. When controlling for self-compassion, the direct effect was reduced, but maintained significance. There was a significant indirect effect $a \times b$ of mindfulness on emotion dysregulation through self-compassion. The effect size was $\hat{\kappa}^2 = .36$ (bootstrap 95% CI [.23, .48]).

**DISCUSSION**

In both models, this combination of significant effects is labeled “complementary mediation” by Zhao et al. (2010, p. 201). This indicates a significant indirect effect; yet it is accompanied by a reduced, but still significant direct effect. We find corroborating evidence that self-compassion is a mediator of the relationship between mindfulness and indicators of BPD symptoms, but there remains the likelihood of an omitted mediator in the direct path.

**GENERAL DISCUSSION**

The purpose of the present studies was to investigate the role of self-compassion in the relationship between mindfulness and reduced BPD symptoms. We hypothesized that self-compassion mediates the effect of mindfulness on BPD symptom severity and emotion dysregulation in individuals with BPD, a healthy control group, and a representative sample from the general population. Our results suggest that self-compassion mediates the effect of mindfulness on reduced BPD symptoms measured as BPD symptom severity as well as emotion dysregulation. In line with our hypotheses, we were able to find evidence for these mediation effects in a group of individuals with BPD, a group of healthy controls (study 1) as well as in a representative sample from the general population (study 2).

In study 1, we found an indirect-only mediation of the relationship between mindfulness and BPD symptoms through self-compassion. One interpretation of this result is that individuals suffering from BPD may benefit
from mindfulness largely through enhancement of self-compassion. While indirect-only mediation implies that no other mediators are likely, another possible explanation could be that the sample size was too small to find a direct effect. On the other hand, post hoc power analyses revealed that statistical power to detect a direct effect was good. In the more diverse sample examined in study 2, which differed significantly on the BSL-23 and the SCS from the healthy controls as well as the individuals with BPD in study 1 (see Table 1), self-compassion partially mediated the effect of mindfulness on reduced BPD symptoms (complementary mediation). Our finding of complementary mediation suggests that further mediators of the effect may exist. While we here focused on self-compassion as a potential mediator of the relationship between mindfulness and BPD, other studies have investigated other mediators, for example rumination (Selby, Fehling, Panza, & Kranzler, 2016). At the same time, studies that investigated the effect of mindfulness and self-compassion as well as other variables on well-being found that mindfulness and self-compassion were significant mediators even if other variables were taken into account (Gu, Strauss, Bond, & Cavanagh, 2015; Svendsen, Kvernenes, Wiker, & Dundas, 2017; van der Velden et al., 2015). However, especially in heterogeneous nonclinical populations, there may exist additional pathways through which mindfulness exerts its beneficial effects (see Hill & Updegraff, 2012).

Our results contribute to a growing body of evidence that mindfulness is a precondition of self-compassion and that self-compassion is one of the mechanisms through which mindfulness affects well-being and mental health (Baer et al., 2012; Bergen-Cico & Cheon, 2014; Birnie et al., 2010; Hollis-Walker & Colosimo, 2011; Keng et al., 2012; Kuyken et al., 2010; Rimes & Wingrove, 2011; Robins et al., 2012; Shapiro et al., 2005; Shapiro et al., 2007). Moreover, Hölzel et al. (2011) hypothesized that self-compassion is a mediator of mindfulness because it works as an emotion regulation strategy. Results of our study support this idea, as we show that self-compassion mediates the relationship between mindfulness and emotion dysregulation.

Among the strengths of the present studies are the assessment of BPD in the first study by structured clinical interviews, the implementation of validated measures to operationalize self-compassion, mindfulness, BPD symptom severity, and emotion dysregulation, as well as the investigation of the mediation models in three different samples. Nevertheless, several limitations of both studies must be acknowledged. First, both studies are cross-sectional studies. Thus, one must also consider the possibility that the relationships between self-compassion, mindfulness, and BPD symptoms are bidirectional or even reversed. We cannot statistically verify whether mindfulness and self-compassion improve BPD symptoms, or whether BPD symptoms cause difficulties with mindfulness and self-compassion. It has been argued that cross-sectional analyses cannot determine mediation, since they do not measure the variables on different time points and thus do not fulfill a basic requirement of mediation analysis (Maxwell & Cole, 2007). Clearly, this calls for the replication of the findings at hand in large-scale studies with
longitudinal designs. The variables should be assessed at least at three separate time points to establish mediation (MacKinnon, 2008).

Second, we did not apply a clinical control group. The especially adaptive path from mindfulness over self-compassion to decreased indicators of BPD symptoms in the group of individuals with BPD could merely reflect an effect of general psychopathology. Future studies may include clinical control groups in order to further clarify the role of self-compassion in the relationship between mindfulness and BPD symptoms in different clinical populations.

Further, some methodological issues should be addressed in future studies. For example, due to procedural constraints in study 1, the DERS and the SCS were assessed at participants’ homes and the BSL-23 and the FFA were assessed when participants arrived at the laboratory. Future studies should pay more attention to controlling the timing and setting of the questionnaire assessment. In addition, in study 2, recruitment took place at an open house event. This recruitment method is biased towards participants who are interested in science and who are more educated than the average population. Future studies could use stratified sampling techniques to ensure participants from more diverse backgrounds.

As we found self-compassion to influence the relationship between mindfulness and BPD symptoms, one possible implication for clinical practice is the implementation of self-compassion into mindfulness trainings and interventions for BPD. While mindfulness was positively associated with self-compassion in this study, direct trainings may show even stronger effects. Hildebrandt, MacCall, and Singer (2017) have recently shown that interventions that explicitly focused on improving care, benevolence, and acceptance had greater effects on these qualities than interventions that focused solely on mindful attention and body awareness. Clinicians working with individuals with BPD could teach self-compassion as an additional emotion regulation strategy for dealing with commonly experienced emotions, such as shame and feelings of self-worthlessness, which likely result in anger and self-harm (Warren, 2015). Krawitz (2012) suggests several specific psychotherapeutic techniques to encourage a self-compassionate attitude in individuals suffering from BPD and chronic self-loathing. For instance, positive biographical imagery or guided writing exercises from the perspective of an imaginary compassionate friend are thought to draw on the self-soothing system related to self-compassion (Gilbert, 2009; Gilbert & Procter, 2006). First empirical evidence for incorporating self-compassion into interventions for BPD was presented in a recent randomized pilot study with patients with a primary diagnosis of BPD (Feliu-Soler et al., 2017). Here, a three-week training program of loving-kindness compassion training was superior to continuing mindfulness practice alone in decreasing BPD severity and self-criticism.

In conclusion, the present research provides initial empirical evidence of self-compassion mediating the association between mindfulness and core BPD symptoms (emotion dysregulation) and their general severity in different samples of healthy controls as well as individuals with BPD. Future re-
search could attempt to replicate the present findings in longitudinal studies with adequately large samples of individuals with BPD next to clinical and healthy control groups and investigating multiple mediator models. The training of mindfulness and self-compassion may be able to reduce BPD symptoms, providing effective emotion regulation strategies.

REFERENCES


