Emotional Responsiveness in Borderline Personality Disorder: A Review of Self-Report and Physiological Measures

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Abstract

Borderline personality disorder (BPD) is a mental disorder characterized by emotional dysregulation, impulsivity, and interpersonal problems. Historically, it has been conceptualized by generalized heightened emotional intensity and reactivity. However, findings regarding emotional responsiveness in adults with BPD are mixed. In this review, objective and subjective research on emotional responsiveness in BPD patients are compared. Empirical primary research articles were found through electronic searching of relevant databases, and six met the inclusion criteria. The methods and findings from the self-report and physiological measures in these articles are compared in an attempt to analyze similarities and differences. The results suggest a negativity bias in BPD, indicating that BPD patients exhibit heightened negative emotional reactivity, particularly in response to BPD-specific emotional stimuli. Limitations of the individual studies and of the current review are discussed, with potential directions for future research.

Keywords: borderline personality disorder, emotional responsiveness, negativity bias

Introduction

Borderline personality disorder (BPD) is a mental disorder characterized by patterns of instability in personal relationships, intense emotions, and impulsivity (American Psychiatric Association, 2013). BPD patients exhibit difficulties regulating their emotions, have more intense experiences of emotion, and take longer to return to baseline levels after emotionally triggering events (Gratz et al., 2016). BPD is more prevalent in the population than

was previously recognized (5.9%), is equally prevalent in men and women, and is associated with significant physical and mental disability (Grant et al., 2008). Many BPD symptoms relate to problems with emotion regulation, which is conceptualized as the process of modulating emotional reactions (Karrass et al., 2006). This prompts the need to better understand emotional functioning in the disorder.

The interpersonal difficulties that characterize BPD have been associated with heightened emotional intensity (i.e., higher baseline levels of emotion) and emotional reactivity. These can be exhibited as a tendency to experience frequent and intense emotional arousal (Bortolla et al., 2019). While it has been previously understood that BPD patients display generalized heightened emotional reactivity and intensity in comparison to healthy counterparts (Bortolla et al., 2019; Domes et al., 2009), the current literature is gaining more evidence for the notion that heightened negative affect (or negative emotional states) is what characterizes BPD (Jeung et al., 2018; Matzke et al., 2014).

Current emotional state(s), or affect, in BPD can be measured using both objective and subjective measures. In light of recent research suggesting new implications for the conceptualization and treatment of BPD, the current review aims to critically analyze the literature on emotional responsiveness in BPD by comparing physiological (objective) and self-report (subjective) responses. The aim is to understand the relationship between negative affect and BPD, which seems to be an underexplored area in the field.

Methods

The inclusion criteria was defined as empirical primary research articles that used either self-report

measures, physiological measures, or both, to assess emotional responsiveness in individuals with BPD. After electronic searches of relevant databases (i.e., APA PsycInfo and PubMed), 6 articles met the inclusion criteria. The following keywords were used: borderline personality disorder, emotion regulation, emotional reactivity, and negative affect.

Self-report measures involved having patients complete questionnaires or report their levels of emotions in response to certain laboratory tasks. Physiological responses included measurements of heart rate (HR), skin conductance response (SCR), and respiratory sinus arrhythmia (RSA) during laboratory tasks. The specific measures used in each study will be further explained in later sections. The goal was to compare the methods and findings of the articles that met inclusion criteria in an attempt to understand the current field's stance on studying emotional responsiveness in BPD.

Self-Report Measures

An experimental study by Gratz et al. (2010) examined emotional reactivity and recovery to two different laboratory stressors and found evidence of context-dependent and emotion-specific reactivity in patients with BPD. The study compared 17 BPD outpatients (88% female) and 18 non-PD outpatients (clinical comparison group; 78% female) recruited through advertisements posted at a psychiatric hospital and on two websites.

Participants completed the Affect Intensity Measure (AIM), a 40-item measure of the characteristic intensity and reactivity of emotional responses, to assess four emotions of interest: anxiety, irritability, hostility, and shame, which were measured at five points throughout the study. PASAT-C (a computer-based laboratory stressor) was used to induce stress, and negative feedback was provided after the task. Significant between-group differences were only observed on trait negative emotional intensity, with BPD patients reporting significantly higher levels of negative emotional intensity than non-BPD participants. BPD patients also reported higher levels of shame after negative feedback, had higher levels of shame than non-PD participants at all time points, and reported statistically significant levels of shame at the end of the recovery period. These results suggest the presence of context-dependent emotional reactivity (rather than generalized emotional reactivity) in BPD, specifically in response to stressors such as negative evaluation. BPD patients also reported higher levels of all emotional responses at baseline, suggesting that emotional intensity in BPD is more generalized than emotional reactivity (Gratz et al., 2010). The results of this study are consistent with previous evidence of underlying emotional intensity in BPD and provide more specific evidence on the types of contexts that result in higher emotional reactivity in BPD. Specifically, negative feedback in response

to a psychological stressor resulted in significantly higher levels of shame in BPD patients, suggesting that BPD patients are especially vulnerable to negative evaluation.

A more recent experiment, designed on a similar notion, explored emotional reactions to feedback by utilizing an ecologically valid virtual peer interaction paradigm (Jeung et al., 2018). 21 BPD patients and 21 healthy controls shared their personal opinions in a chatroom. Then, they received feedback in 3 conditions: agreement, disagreement, or neutral statements. After feedback, participants rated the intensity of their own emotional responses, measuring happiness, sadness, anger, and shame. Ratings of 'self' and 'other' affirmations were also reported to measure responses to feedback. The results showed that BPD patients reported more intense negative emotions (sadness, anger, and shame) and less happiness than healthy controls across all social feedback conditions. BPD patients' responses also corresponded with the valence of the feedback: they were most happy after positive than neutral feedback and least happy after negative feedback. Both groups exhibited more anger and less 'other' affirmation in the disagreement condition, but only the BPD group exhibited higher shame (Jeung et al., 2018). The chatroom paradigm allowed these researchers to be the first to study aspects of social feedback that have not been assessed in previous literature and

highlights the everyday negative emotional reactions that play an important role in the interpersonal difficulties of patients with BPD. The results of this study are similar to the findings by Gratz et al. (2010), suggesting context-dependent reactivity in BPD patients, specifically more negative emotions such as anger and shame experienced in response to negative feedback, such as disagreement.

The results from the subjective measures discussed in the current review both provide similar results, perhaps because they both use comparable research designs. Both studies provide evidence for generalized negative emotional intensity in BPD and emphasize context-dependent emotional reactivity. While Gratz et al. (2010) included only one feedback condition (negative feedback) and only assessed negative emotions, Jeung et al. (2018) extended these findings by including three feedback conditions (agreement, disagreement, and neutral statements) and assessments of happiness. Both studies also recognize shame as having significantly higher reactivity in BPD patients in comparison to both non-PD patients and healthy controls, suggesting that BPD patients are more vulnerable to experiencing shame after negative feedback and disagreement. In the context of the current review, these studies provide evidence for studying emotional reactivity and intensity in BPD patients through self-report responses in

feedback paradigms. It is also proposed that the role of shame in BPD can be further explored with similar research methods.

Physiological Measures

In an attempt to understand emotional reactivity in BPD patients, Limberg et al. (2011) recorded eye-blink, HR, and SCR responses in 40 nonmedicated BPD patients (37 female, 3 male) and 32 healthy controls (27 female, 5 male) in a script-driven imagery paradigm. The participants first read and then imagined the scripts while physiological activity was recorded. Idiographic aversive BPD-specific scripts (scenes about rejection and abandonment) and standard unpleasant, neutral, and pleasant scripts were presented to all participants. In total, nine pleasant, nine unpleasant, and three neutral scripts were presented. For the unpleasant scripts, three described survival threat, three described scenes of abandonment, and three described scenes of rejection. No between-group differences were observed in the overall emotional modulation of the startle responses. Although standardized emotional scripts did not result in group differences, BPD-specific scripts (rejection and abandonment) led to significant differences, resulting in a clear potentiation of the startle response and an increase in autonomic responses in BPD patients (Limberg et al., 2011). The results of this study present similar findings to

the self-report findings previously discussed, emphasizing the role of BPD-relevant stimuli in emotional reactivity in BPD.

Similarly, Kuo et al. (2016) presented neutral and BPD-relevant negative images to 25 medicated BPD patients and 30 healthy controls and instructed them to either behave as they naturally would, or to use mindful-based strategies to feel less negative. Measurements consisted of baseline and post-task assessments of heart rate, electrodermal activity, and respiratory sinus arrhythmia. Self-report measures were also collected in the study, but yielded no significant findings, resulting in their absence from the analysis. The study found that BPD patients had higher levels of physiological measurements at baseline and that they did not exhibit higher emotional reactivity than controls (Kuo et al., 2016). These findings indicate baseline levels of emotional dysfunction in BPD, suggesting that targeting resting-state emotions may be helpful for BPD treatment.

The studies utilizing physiological measures to assess emotional responsiveness discussed in this section (Limberg et al., 2011; Kuo et al., 2016) provide mixed results. While Limberg et al. (2011) found that BPD-relevant emotional stimuli resulted in heightened emotional reactivity in BPD patients, Kuo et al. (2016) found no between-group differences. This discrepancy in results

may be attributed to differences in BPD patient samples. While Limberg et al. (2011) recruited an unmedicated BPD sample, Kuo et al. (2016) included a medicated BPD sample, which may have had effects on physiological responses. Further research using similar methods to assess emotional reactivity in BPD is needed to clarify this notion.

Results

Many studies in the field have also compared findings from self-report and physiological measures to better understand emotional responsiveness in BPD. Matzke et al. (2014) compared 28 healthy female participants and 28 female BPD patients on their self-report and physiological responses in the context of a facial emotion recognition task. The researchers found no correlation between self-report and physiological measures. The self-report component of the study involved participants rating the intensity of a displayed emotion and the intensity of their subjective feeling while watching the displayed emotion. The physiological responses consisted of recording facial electromyography (EMG) data from five facial muscles: the occipitofrontalis, corrugator supercilia, levator labii superioris, zygomaticus major, and orbicularis oculi. The study found evidence for a negativity bias in BPD: BPD patients showed increased facial reactions to negative facial stimuli and decreased responses to positive faces.

In terms of the correlation between the self-report and physiological measures used in this study, no significant correlation was found between EMG responses or subjective emotional responses to the different facial emotions and the psychometric measurements of emotional state or trait variables. There were no overall group differences in emotion recognition performance or intensity ratings (Matzke et al., 2014). The findings from this study suggest a reduced experience of happiness in BPD, providing evidence against the notion that BPD patients have generally impaired facial emotion recognition and increased sensitivity to others' displayed emotions. Along with the previous studies discussed in the current review, this study provides support for a negativity bias in BPD patients by observing their reduced facial reactions to positive social signals and increased facial reactions to negative social signals.

Subsequently, a study by Bortolla et al. (2019) compared 14 female healthy controls' and 14 female BPD patients' self-reported (quality and intensity of emotions) and physiological (heart rate and respiratory sinus arrhythmia) data in response to 6 emotion-eliciting film clips. Each video clip included different emotional content to induce distinct emotions. This study found no group differences in the self-report measures, indicating that patients did not seem to report differences in the quality and

intensity of the emotions elicited by the affective stimuli (with the exclusion of the amusement clip). This is in line with previous research showing null differences between BPD patients and controls in general trait level responses to emotional stimuli. Another finding consistent with previous research was that BPD patients rated positive stimuli with significantly lower scores on happiness compared to healthy controls, supporting the notion of a negativity bias in BPD. The physiological measures in this study also demonstrated no significant group differences, showing that the hyperreactivity hypothesis was not supported. The clinical group showed lower respiratory sinus arrhythmia activity and higher heart rate at baseline, which remained consistent throughout the study, supporting the hypothesis of a biological vulnerability to emotion dysregulation in BPD (Bortolla et al., 2019). This supports the notion that a constant state of hyperactivation in BPD patients may result in the interpersonal difficulties that characterize the disorder.

A consistent finding among both studies comparing self-report and physiological measures of emotional responsiveness in BPD within this review is the limited access to positivity in BPD. Bortolla et al. (2019) found that BPD participants rated positive stimuli with significantly lower scores on happiness compared to healthy controls. Matzke et al. (2014) observed this phenomenon in physiological responses, whereby BPD patients exhibited

increased facial responses to negative facial stimuli and decreased responses to positive stimuli. Obtaining this result through different types of measures provides strong evidence for a negativity bias in BPD.

The results on the comparisons of self-report and physiological measures are mixed. Matzke et al. (2014) found no correlation between self-report and physiological responses, but found significant group differences within each measure, while Bortolla et al. (2019) were not able to find significant group differences using either measure. The support for negativity bias in both these studies is in line with the other studies discussed in the current review, but perhaps they would have found support for BPD reactivity by including BPD-relevant emotional stimuli along with standardized emotional stimuli.

Discussion

The current review aimed to evaluate the available literature on emotional responsiveness in individuals with BPD. Specifically, results from self-report and physiological measures were compared to synthesize similarities and differences. Self-report findings indicate generalized negative emotional intensity in BPD and emphasize context-dependent emotional reactivity. Both of the studies with subjective measures used self-report questionnaires that assessed participants' emotions in feedback paradigms, finding

that shame may play an important role in BPD. Studies employing physiological measures and those comparing both self-report and physiological findings produced variable results. The studies in the former section may have varied since Kuo et al. (2016) included a medicated BPD sample while Limberg et al. (2011) did not.

The studies in the latter section did not use methods that employed any BPD-specific stimuli, which may explain the inconsistency in their findings. The studies discussed in the Self-Report Measures and The studies in the latter section did not use methods that employed any BPD-specific stimuli, which may explain the inconsistency in their findings. The studies discussed in the Self-Report Measures and Physiological Measures sections of this paper utilized BPD-relevant emotional situations and were able to find significant implications for reactivity in BPD. The studies comparing both self-report and physiological measures used standard emotional pictures (Matzke et al., 2014) and film clips (Bortolla et al., 2019), which may have resulted in mixed and non-significant findings. Overall, the results suggest that the most effective way to assess emotional reactivity in BPD is to utilize BPD-relevant stimuli and situations.

The current review does hold some limitations. Firstly, the studies included in this review did not employ the same research designs and measures. Due to the limited research on negative affect in BPD,

studies using different research designs were compared (i.e., emotion-eliciting film clips, feedback paradigms, surveys). Additionally, questionnaires are susceptible to self-report bias that does not exist with the use of physiological measures. Reports may find different patterns of results depending on the type of measure that was used. This may explain why in the current review, studies with self-report findings showed more consistent and similar results than studies with physiological measures. Perhaps heightened negative affect in BPD is more prevalent when subjective measures are used. Keeping this limitation in mind, the current review compared self-report and physiological measures to understand how findings using different measures differed. Future reviews may benefit from comparing studies that utilize similar research designs.

Some studies only included female participants (Bortolla et al., 2019), which could limit the generalizability of the results. This may be because females are more likely to seek treatment for BPD (Grant et al., 2008), so they were more accessible for the study. Since BPD is equally prevalent among males and females, conclusions based on female-only samples may not apply to the general BPD population. Additionally, the studies in this review contain small sample sizes, which may inflate the results and further limit generalizability. Future research may benefit from reviewing studies with larger

BPD patient samples across both sexes. It is also important to consider the findings within the wider body of research on emotional responsiveness and BPD (rather than just self-report and physiological responses), such as brain imaging scans and behavioural measures.

It is also worth considering that these findings may not be specific to BPD. Similar patterns might be observed in other clinical samples that are also characterized by negative affectivity, such as anxiety and depression. Future research should compare BPD patients with those diagnosed with anxiety and major depressive disorder to see if similar patterns of a negativity bias are observed.

Conclusion

In summary, although evidence on emotional responsiveness in BPD is mixed, it appears that BPD patients possess a negativity bias and limited access to happiness, making them experience negative emotions more intensely than positive emotions. In terms of reactivity, BPD patients do not display significant differences in comparison to control groups unless BPD-specific emotional stimuli or situations are used. This suggests that emotional responsiveness in BPD could be better understood by employing specific contexts rather than studying it at the general trait level. There seem to be variable results regarding comparisons of self-report and

physiological data, in which some studies show strong physiological responses and blunted self-report findings, while other studies find no differences. Further research comparing different measures of emotional responsiveness in individuals with BPD needs to be conducted in order to develop clear targets of treatment. Understanding the specific emotional functions in BPD paves the way for enhanced evidence-based treatments that may improve emotion regulation strategies.

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