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Borderline personality disorder features, emotion dysregulation and non-suicidal self-injury: Preliminary findings in a sample of community-dwelling Italian adolescents

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ABSTRACT

In order to assess the relationships among borderline personality disorder features, non-suicidal self-injury (NSSI) and emotion dysregulation, 122 community-dwelling Italian adolescents were administered by the Italian translations of the Borderline Personality Features Scale for Children-11, the Deliberate Self-Harm Inventory and the Difficulties in Emotion Regulation Scale (DERS). Regression models showed that both Deliberate Self-Harm Inventory (DSHI) and DERS scores significantly predicted Borderline Personality Features Scale for Children-11 total score; moreover, the DSHI total score significantly predicted the DERS total score. Our findings suggest that borderline personality features in adolescence are moderately, albeit significantly related to NSSI, and that emotion dysregulation does not completely account for the association between borderline personality features and NSSI, although it seems to explain a non-trivial proportion of this relationship. Copyright © 2016 John Wiley & Sons, Ltd.

Borderline personality disorder (BPD) is a debilitating disorder that occurs in approximately 1–3% of the general population (Leichsenring et al., 2011; Lenzenweger, 2008). Individuals with BPD often engage in self-injurious and suicidal behaviour, gambling, compulsive shopping, substance or alcohol use, binge eating and reckless driving (APA, 2013; Leichsenring et al., 2011). Given that these types of impulsive, self-destructive behaviours may lead to psychiatric hospitalization and/or incarceration (e.g. Leichsenring et al., 2011), there has been increased research focus on the early identification and treatment of BPD in youth in order to prevent the clinical and social burden that is frequently associated with BPD diagnosis in adults (Chanen, 2011; Miller et al., 2008; Sharp et al., 2009). Although BPD criteria may be over-inclusive of symptoms that characterize the developmental period of adolescence (Miller et al., 2008), prevalence rates of thoroughly assessed BPD diagnosis (3.27% in a community sample of 6330 11-year-old participants) support the diagnosis of BPD in adolescence and even in late childhood (Zanarini et al., 2011).

Psychometric data clearly indicate that BPD can be reliably diagnosed in adolescence by using descriptive diagnostic criteria (Michonski et al., 2013; Miller et al., 2008; Sharp et al., 2012); however, a dimensional perspective may be particularly important for conceptualizing BPD pathology among youth because it is better able to account for the developmental fluctuations and increased heterogeneity that have been reported in younger samples (e.g. Michonski et al., 2013).

Valid and reliable dimensional instruments that are both time and cost-effective would greatly assist clinicians in the assessment of BPD features in adolescence (Sharp et al., 2012). Starting from these considerations, Sharp et al. (2014) proposed the 11-item version of the Borderline Personality Features Scale for Children (BPFSC-11), a reliable and valid measure of BPD in adolescence (Fossati et al., 2016; Sharp et al., 2014). The BPFSC-11 includes items concerning affective instability, identity problems and negative relationships, which represent core features of BPD in adolescence (Fossati, 2014), and seems to represent a promising measure for assessing BPD features in community samples of adolescents, since it reduces the risk of 'defensive' responses based on adolescents' social desirability while retaining the diagnostic information for dimensional assessment of BPD features.

In adult subjects, non-suicidal self-injury (NSSI) is considered part of behaviour dysregulation, which represents a core feature of BPD (e.g. Leichsenring et al., 2011). NSSI is defined as 'the deliberate destruction of body tissue without conscious suicidal intent but resulting in injury severe enough for tissue damage to occur' (Gratz & Roemer, 2008). The relationship between NSSI and BPD features in adolescence seems to be more controversial than in adulthood. A number of studies documented that NSSI is frequently observed among community-dwelling adolescents. A review from the last decade suggested that 7–14% of adolescents deliberately injure themselves at least once (Hawton & James, 2005), with a higher prevalence in women than in men. Recently, Brunner et al. (2014) reported that the overall lifetime prevalence of NSSI among community-dwelling adolescents from 11 countries was 27.6%; in particular, the estimated prevalence of NSSI in Italian adolescents was 20.6%. The prevalence of occasional NSSI was 19.7% with significantly lower number of adolescents (7.8%) reporting to engage in repetitive NSSI (Brunner et al., 2014); however, BPD diagnosis is rarely observed among community-dwelling adolescents (3.27%; Zanarini et al., 2011).

Although NSSI is a common feature of BPD in adolescence (e.g. Nock et al., 2006), available evidence suggests that it is neither necessary nor sufficient symptom for diagnosing BPD in adolescence (e.g. Glenn & Klonsky, 2013; Siever et al., 2002). For instance, in a large sample of middle-school and high-school students ($n = 1931$), Gratz et al. (2012) showed that although BPD features were reliably associated with NSSI status, rates of NSSI varied as function of gender, racial/ethnic background and school level. Despite this, NSSI should be carefully assessed in adolescence because of four key issues: (1) it is highly addictive (Stanley et al., 2010); (2) it shows a significant overlap with suicidal behaviour (Nock et al., 2006); (3) it is a marker of mentalizing collapse (Bleiberg et al., 2011); and (4) it may be evocative of intense, albeit frequently chaotic and problematic reactions in others—e.g. acute hospitalizations and desperate efforts of parental control.

It seems also important to understand the role of emotion dysregulation in BPD features and NSSI in adolescence. Indeed, prominent scholars proposed that emotion dysregulation may represent a core feature of BPD in adulthood (e.g. Bateman & Fonagy, 2004; Crowell et al., 2009); however, research has not clarified the specific role of emotion dysregulation in the relationship between NNSI and BPD in adolescence yet. In this respect, Linehan (1993) proposed that NSSI is triggered by emotion dysregulation and may serve an emotion-regulation function in adult BPD subjects, and a recent analysis of 18 studies, which investigated various reasons for self-

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injuring, found strong support for an overall affect-regulation function of NSSI (Klonsky & Olino, 2007). However, other researchers proposed that NSSI might serve other intrapersonal (e.g. self-punishment) and interpersonal (e.g. bond with peers and establishing autonomy) functions (Muehlenkamp et al., 2013; Sadeh et al., 2014).

Given the high prevalence of NNSI behaviours in the general adolescent population (e.g. Muehlenkamp et al., 2012) and the fact that some adolescents who engage in self-harm behaviours go on to develop BPD, studying the relationship between NNSI and BPD in adolescence may have important implications for conceptualizing and treating BPD during its early stages, when targeted treatment is most effective. Although previous research has linked both NSSI and emotion dysregulation with BPD traits, no study has investigated simultaneously the associations between BPD traits, emotion dysregulation and NSSI in adolescence. This aspect is relevant because there are unique aspects in adolescence that warrants replication of adult findings in this developmental period (e.g. De Clercq et al., 2014). Indeed, not only adolescents may engage in NNSI behaviours in the absence of prominent BPD features, but emotion dysregulation also undergo specific changes in adolescence (Casey et al., 2008), and it means that it may correlate differently with relevant constructs (e.g. BPD features) during this developmental period. Moreover, the availability of studies on BPD traits in adolescence in different linguistic or cultural contexts (i.e. rural Italian community) will help to address concerns that useful clinical information is not lost in the translation of BPD diagnoses from adulthood to adolescence also in a cultural context different from the USA.

Starting from these considerations, we aimed at testing the association between dimensionally assessed BPD features, and measures of NSSI and emotion dysregulation respectively, as well as the association between measures of NSSI and emotion dysregulation, in a sample of community-dwelling adolescents. Community-based studies may be particularly useful in improving our knowledge of BPD psychopathology, including in adolescence. Indeed, Berkson's bias (Berkson, 1946) suggests that clinic/hospital patients may not only be unrepresentative of the population of BPD cases (e.g. showing more severe personality disorder impairment and perhaps greater Axis II comorbidity) but are also likely to present with greater pathology of all sorts (e.g. Axis I, medical disorders and other impairments; Lenzenweger, 2008).

In particular, consistent with previous work (e.g. Gratz et al., 2012), we expected that the frequency of NSSI episodes showed a significant, positive association with BPD features. In addition, consistent with different theoretical models of BPD (Bateman & Fonagy, 2004; Linehan, 1993), we expected that emotion dysregulation showed a positive and significant association with BPD features. Moreover, research has provided support for an association between NSSI and emotion dysregulation (e.g. Gratz & Roemer, 2008); thus, we expected that the frequency of NSSI episodes were positively and significantly associated with emotion dysregulation. Finally, we tested a mediation model in order to evaluate if emotion dysregulation was a significant mediator of the association between frequency of NSSI episodes and BPD features (e.g. Klonsky, 2007). Moderated regression was used to evaluate the presence of significant gender effects on slope parallelism in regression models.

Method

Participants

One hundred and forty adolescents who were attending public high school with specialization in teacher training or social sciences (100% of the students in the school) in Todi, a small town in a rural county of Central Italy, originally agreed to participate in the study; however, 17 participants (2.7%) yielded incomplete questionnaires (questionnaires were considered incomplete if

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more than 10% of the items in any given scale were not answered) and were excluded from the final sample. Participants with incomplete questionnaires did not differ from participants with complete questionnaires on gender, $\chi^2(1) = 1.52$, $p > 0.20$, $\phi = 0.04$, and age $t(138) = 0.29$, $p > 0.70$, $d = 0.05$. The final sample was composed by 122 adolescent; 93 participants (76.2%) were female and 29 participants (23.8%) were male, with a mean age of 16.69 years, $SD = 1.81$ years (range: 14–19 years). All participants voluntarily took part in the study and gave their written consent to participate in the study after it had been explained to them; for those participants of minor age, their parents provided consent for them to participate in the study. Institutional Review Board approval was obtained for all aspects of this study, which was conducted adhering to the American Psychological Association ethical norms.

Measures

Participants completed the Italian versions of the Borderline Personality Features Scale for Children-11 (BPFSC-11; Sharp et al., 2014), the Deliberate Self Harm Inventory (DSHI; Gratz, 2001) and the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). For all questionnaires, the adequacy of the Italian translations to their respective original versions was controlled by English mother-tongue professional translators through back-translations. The questionnaires were administered and scored anonymously during class time by graduate psychology students when teachers were not present in the classrooms; participants had approximately 45 min to complete the questionnaires. The questionnaires were administered in random order.

Borderline Personality Features Scale for Children-11 (Sharp et al., 2014)

The BPFSC-11 is an 11-item, Likert-type measure that was specifically designed to measure borderline personality features in childhood (for ages 9 and older, including adolescents). It was developed from the original 24-item BPFSC (Crick et al., 2005). BPFSC-11 items are rated on a 5-point Likert-type scale ranging from *not true at all* to *always true*. Items in the BPFSC-11 comprise behaviour reflective of core BPD features, namely affective instability, identity problems and negative relationships. No 'self-harm' item has been included in the BPFSC-11. The BPFSC-11 has shown adequate reliability (Cronbach $\alpha = 0.85$; Sharp et al., 2014); in terms of construct validity, the BPFSC-11 showed adequate sensitivity (0.74) and specificity (0.71) with respect to *DSM-IV* BPD diagnosis, as well as significant correlations with measures of self-harm and emotion dysregulation, in a sample of adolescent inpatients (Sharp et al., 2014). The BPFSC-11 yields a total score measuring the overall level of borderline characteristics: the higher the BPFSC-11 total score, the greater the intensity of BPD features. In a previous sample of 805 Italian adolescents, the Italian translation of the BPFSC-11 correlated substantially with a self-report measure of *DSM-IV* BPD symptoms, $r = 0.64$, $p < 0.001$ (Fossati et al., 2016).

Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004)

The DERS is a 36-item, Likert-type, self-report measure that provides a comprehensive assessment of overall emotion dysregulation as well as six specific dimensions: nonacceptance of negative emotions, difficulties engaging in goal-directed behaviours when distressed, difficulties controlling impulsive behaviours when distressed, limited access to effective emotion regulation strategies, lack of emotional awareness and lack of emotional clarity. Participants are asked to indicate how often the items apply to themselves, with responses ranging from 1 to 5, where 1 is *almost never* and 5 is *almost always*. The DERS has demonstrated good test–retest reliability and adequate construct and predictive validity (Gratz & Roemer, 2004). Further, the DERS has been found to have good internal consistency and adequate construct and

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convergent validity among adolescents aged 11–17 years, as well as a similar factor structure to that found in adults (Neumann et al., 2010).

Deliberate Self-Harm Inventory (Gratz, 2001)

The DSHI is a behaviourally based, self-report questionnaire that assesses deliberate self-harm (the deliberate, direct destruction or alteration of body tissue without conscious suicidal intent, but resulting in injury severe enough for tissue damage to occur). This measure is composed of 17 items and assesses various aspects of deliberate self-harm, including frequency, severity, duration and type of self-harming behaviour. The DSHI has high internal consistency ($\alpha = 0.82$), adequate construct, convergent and discriminant validity and adequate test–retest reliability over a period ranging from 2 to 4 weeks, with a mean of 3.3 weeks ($\phi = 0.68$, $p < 0.001$; Gratz, 2001). Consistent with previous studies (e.g. Gratz, 2001), in the present study, a continuous variable was created to measure frequency of reported self-harm behaviour. Participants' scores on the frequency questions for each of the 17 items were summed to create a variable of the total frequency of self-harm behaviour.

Results

Descriptive statistics, Cronbach α values and gender comparisons for the BPFSC-11, DSHI and DERS total scores are listed in Table 1. When the BPFSC-11 total score was averaged over the 11 items in order to rescale it on a 1-to-5 scale, we obtained a value of 2.67, suggesting that on average, the characteristics that are measured by the BPFSC-11 items were rated by our adolescent participants between 'hardly ever true' and 'sometimes true'. Thirty-five adolescents (28.7%) reported at least one episode of self-injury on the DSHI (in this sample, DSHI scores ranged from 0 to 8); however, high frequency (i.e. three or more episodes) of self-injury was reported on the DSHI only by 5.7% ($n = 7$) of our participants. Interestingly, a significantly higher proportion of female participants (88.6%) than male participants (11.4%) was observed among adolescent who reported at least one self-injury episode, $\chi^2(1) = 4.13$, $p < 0.05$, $\phi = 0.18$. The most frequently reported NSSI behaviours were cutting (12.3%), severe scratching (8.2%), carving words into skin (5.7%) and preventing wounds from healing (4.9%). In the whole sample, the BPFSC-11 total score correlated (Pearson r) 0.38 and 0.55, all ps < 0.001, with the DSHI total score and the DERS total score respectively; the DERS total score correlated significantly with the DSHI total score, $r = 0.37$, $p < 0.001$. Considering DSHI items (i.e. individual NNSI behaviours), multiple regression analysis showed that carving words into skin, $\beta = 0.34$, $p < 0.001$, and self-cutting, $\beta = 0.27$, $p < 0.01$ predicted significantly, albeit

Table 1: Descriptive statistics, Cronbach α values and gender comparisons for the Borderline Personality Features Scale for Children-11, Deliberate Self-Harm Inventory and Difficulties in Emotion Regulation Scale total scores ($n = 122$)

	Full sample ($n = 122$)			Male adolescents ($n = 29$)			Female adolescents ($n = 93$)			$t(120)$	d
	M	*SD*	α	*M*	*SD*	α	*M*	*SD*	α		
BPFSC-11 total score	29.33	7.49	0.83	25.30	7.18	0.85	30.68	7.20	0.83	−3.42***	−0.62
DSHI total score	0.57	1.18	0.73	0.38	1.12	0.83	0.61	1.18	0.71	−0.94	−0.17
DERS total score	92.34	24.08	0.93	84.20	15.42	0.84	94.34	24.86	0.93	−2.50*[a]	−0.34

Note: BPFSC-11: Borderline Personality Features Scale for Children-11, DSHI: Deliberate Self-Harm Inventory, DERS: Difficulties in Emotion Regulation Scale, *d*: standardized mean difference, a: separate-variance *t*-test with 63 degrees-of-freedom.
*$p < 0.05$.
***$p < 0.001$.

DOI: 10.1002/pmh

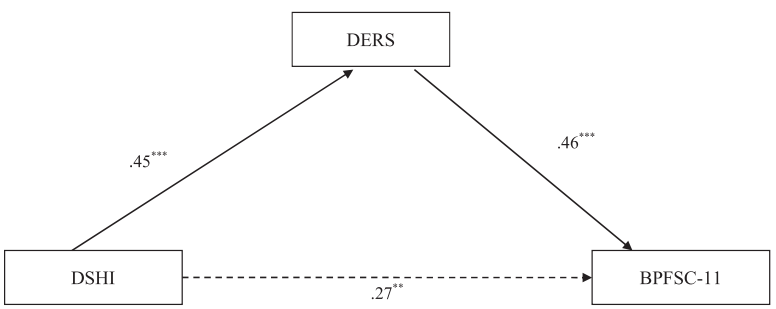
moderately, the BPFSC-11 total score, adjusted $R^2 = 0.18$.

Regression analyses showed that the DSHI total score explained a significant, albeit moderate proportion of variance in the BPFSC-11 total score, adjusted $R^2 = 0.14$, $\beta = 0.38$, $p < 0.001$; moderated regression showed no significant slope difference between male participants and female participants, gender-by-DSHI interaction $R^2 = 0.001$, $p > 0.70$. The DERS total score explained a significant and substantial proportion of variance in the BPFSC-11 total score, adjusted $R^2 = 0.30$, $\beta = 0.55$, $p < 0.001$, with no significant gender-by-DERS interaction effect, $R^2 = 0.000$, $p > 0.80$. Finally, the DSHI total score predicted a significant proportion of variance in the DERS total score, adjusted $R^2 = 0.13$, $\beta = 0.37$, $p < 0.001$; moderated regression analysis did not evidence any significant difference in slope coefficient between male adolescents and female adolescents, gender-by-DSHI interaction effect, $R^2 = 0.01$, $p > 0.40$.

Mediation analyses showed that the DSHI total score was significantly related to the BPFSC-11 total score, $\beta = 0.48$, $p < 0.001$, as well as to the mediator, namely, the DERS total score, $\beta = 0.45$, $p < 0.001$; in turn, the DERS total score significantly predicted the BPFSC-11 total score, $\beta = 0.46$, $p < 0.001$. When the mediator effect was controlled for, a significant effect of the mediator on this association was observed, *axb* coefficient = 0.21, 95% bias corrected and accelerated confidence interval (based on 1000 bootstrap replications) = 0.07, 0.39. Although the DERS total score explained a moderately large amount of the relationship between the DSHI total score and the BPFSC total score, $k^2 = 0.18$, 95% bias corrected confidence interval (based on 1000 bootstrap replications) = 0.07, 0.31, the direct effect of the DSHI total score on the BPFSC-11 total score remained significant, $\beta = 0.27$, $p < 0.01$. The results of this mediation analysis are summarized in Figure 1.

Discussion

Although preliminary, the present study represents the first attempt to test the associations among BPD features, NSSI and emotion dysregulation in a sample of nonclinical adolescents. Consistent with previous findings (Fossati et al., 2016), our



Note. DSHI: Deliberate Self Harm Inventory; DERS: Difficulties in Emotion Regulation Scale total score; BPFSC-11: Borderline Personality Features Scale for Children-11.

* $p < .05$
** $p < .01$
*** $p < .001$

Figure 1: Path diagram showing completely standardized mediated effect (through Difficulties in Emotion Regulation Scales) and direct effect of the Deliberate Self Harm Inventory on the Borderline Personality Features Scale for Children-11. For ease of presentation, residual terms were omitted. *Note*: DSHI: Deliberate Self Harm Inventory, DERS: Difficulties in Emotion Regulation Scale total score, BPFSC-11: Borderline Personality Features Scale for Children-11. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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results showed that BPFSC-11 items seemed to assess individual differences in characteristics that are endorsed at relatively low levels by dwelling-community adolescents, suggesting that it may be able to reliably disentangle BPD features from adaptive adolescence turmoil. This conclusion is supported by the results of the item response theory study by Sharp et al. (2014), which demonstrated that the BPFSC-11 items function at the more severe end of the BPD latent trait continuum.

Moreover, consistent with available evidence on NNSI in adolescence (e.g. Brunner et al., 2014), 28.7% of the youth in this sample reported at least one episode of NSSI, with a markedly lower number of adolescents (5.7%) reporting repetitive (at least three episodes) NSSI. In addition, the frequency of self-reported NSSI episodes, at least as operationalized in the DSHI total score, was significantly, albeit moderately related to BPD features and to emotion dysregulation respectively. Although our findings were based on a small sample of community-dwelling adolescents, this moderate association is consistent with available evidence indicating that NSSI is neither a necessary nor a sufficient condition for BPD diagnosis in adolescence (e.g. Siever et al., 2002). Interestingly, in our preliminary study, the frequency of NSSI episodes was a moderate predictor of self-reports of emotion dysregulation, at least as they are assessed by the DERS total score. It should be observed that these associations were based on measures that do not include overlapping items (i.e. items with similar wording or assessing the same behaviour), although may have been biased by shared-method variance (i.e. we relied on self-report measures).

In all, the findings of the current study are consistent with previous studies (Brunner et al., 2014) indicating that NSSI is manifested by a substantial minority of community-dwelling adolescents and that NSSI in adolescence may be associated with a number of different factors, including social and ethnic factors, rather than being uniquely related to BPD (Gratz et al., 2012). Of course, this is not to say that clinicians should overlook the importance of NSSI in adolescence; rather, our data suggest that they should monitor the frequency of the NSSI episodes and carefully assess the possible presence of a number of maladaptive behaviours (e.g. substance abuse and eating disorders (EDs)), including BPD.

It should be observed that the cross-sectional design of our study does not allow to test any causal model of BPD traits in adolescence; at best, it allows to make inferences on possible, hypothesized pathways leading to BPD features. However, consistent with available evidence on adult samples (e.g. Leichsenring et al., 2011) and with different theoretical models of BPD (e.g. Bateman & Fonagy, 2004; Linehan, 1993), in our study, emotion dysregulation (i.e. the DERS total score) seemed to represent a core feature of BPD, at least as it is assessed by the BPFSC-11 total score; indeed, the DERS total score explained roughly 30% of the overall variation in self-reported BPD features among our adolescent participants.

In our study, mediation analyses showed that emotion dysregulation was a significant mediator of the relationship between NSSI and BPD features, at least in a sample of dwelling-community adolescents; however, we observed only a partial mediation effect of the DERS total score. On the one hand, these findings seemed to suggest that NSSI may represent just one of several dysfunctional emotion-regulation strategies in adolescents at risk for BPD—for instance, sexual promiscuity, substance abuse and binge eating/drinking may represent alternative ways to down-regulate negative emotion or up-regulate positive emotions in BPD adolescents, although we did not explicitly tested this hypothesis in our study. On the other hand, our results (i.e. partial mediating role of the DERS total score) suggest that NSSI in adolescence may not represent exclusively an emotion regulation strategy; this is consistent with available evidence suggesting that NSSI in adolescence may fulfil several other intra-personal and inter-personal needs, ranging from self-punishment and physical externalization

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of emotional pain to regulating bond with peers and establishing autonomy, particularly in adolescents with BPD features (e.g. Sadeh et al., 2014).

Our study was carried out in a relatively small sample of community-dwelling adolescents; thus, caution should be used in considering the clinical implications of our findings, and replications in clinical samples are necessary to generalize to adolescents with BPD pathology. Despite these limitations, our data suggest that clinicians should be sensitive to addressing the issue of emotion regulation in the assessment and treatment of BPD in adolescence (Bateman & Fonagy, 2004; Linehan, 1993). However, our results seem also to suggest that fostering emotion regulation may not immediately produce a reduction of NSSI in adolescents with emerging BPD features, as well as the reduction of NSSI is unlikely to result automatically in emotion regulation in adolescents. In other terms, both NSSI and emotion regulation should be individually and specifically addressed in the treatment of BPD adolescents.

Adolescence represents a period of elevated risk for NSSI as well as opportunities for early intervention and treatment. Our preliminary findings have clinical implications for targeting NSSI and emotion dysregulation in youth with BPD features in that they suggested that NSSI and emotion dysregulation are related to BPD features also in adolescence. Thus, the results of the present study seem to suggest that studying the relations between NSSI, BPD features and ED is worth it in adolescent subjects, and they may represent a justification and a starting point for future longitudinal, or 'daily diary' studies on BPD, ED and NNSI in large samples of community/clinical adolescence. Moreover, the present study was conducted in rural Italian community; thus, our findings seem to suggest that the BPFSC-11, the DERS and the DSHI may provide useful information also in a sample of community-dwelling Italian adolescents.

Of course, our findings should be considered in the light of several limitations. Our study was based on a small sample of community-dwelling adolescents who voluntarily took part in the study; moreover, seven (5.7%) participants had engaged in NSSI on three or more occasions. These considerations inherently limits the generalizability of our findings and requires independent replications before accepting our findings. However, we would like to stress that our findings were largely consistent with previous studies, particularly with studies on NSSI in adolescence, although relying on volunteers may have biased our sample towards the inclusion of adolescents with a high rate of problem behaviours, including BPD features. We relied only on self-report measures for the assessment of predictive variables, dependent variables and mediation variables respectively; although we used questionnaires which had no item overlap, shared-method variance may have spuriously inflated the bivariate (and multivariate) between-measure associations, biasing also regression/mediation analyses. We used the BPFSC-11 as a measure of BPD features in adolescence; although consistent data supported the reliability and validity of the BPFSC-11 as a measure of adolescent BPD features, we cannot exclude that we would have obtained different findings if we relied on a different measure of BPD. Moreover, consistent with previous studies (e.g. Gratz, 2001), we created a continuous variable to measure the frequency of reported self-harm behaviour (i.e. DSHI total score). It could be argued that the frequency alone does not translate into NSSI severity. However, we would like to stress that summing the frequency of reported self-harm behaviour over periods of time has been used to examine the relationship between NNSI and increased risk of suicide, depression, anxiety and personality disorder (e.g. Klonsky & Olino, 2007; Nock et al., 2006; Sansone et al., 1998). Indeed, the formation of a total score formed by summing the frequency of reported self-harm over a period of time is based on the premise that (1) the frequency of self-harm behaviour is clinically informative and (2) the various methods included in the counting procedure all relate to the same underlying NNSI construct (Latimer et al., 2013). Finally, our study was based on a cross-sectional design; although we performed

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mediation analyses, the design of our study prevented us from studying any causal relationship.

Despite these limitations in mind, the results of our study may be useful in improving our knowledge of emerging BPD features in adolescence and their relationships with NSSI and emotion dysregulation, in order to develop efficient strategies specifically designed for BPD treatment in adolescence.

Conflict of interest

The authors declare that they have no conflict of interest.

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