



Non-suicidal self-injury in young adults with and without borderline personality disorder: the role of emotion dysregulation and negative urgency

Carlos Schmidt^{1,2}, Laia Briones-Buixassa^{1,3}, Stella Nicolaou¹, Joaquim Soler^{4,5,6}, Juan C. Pascual^{4,5,6} and Daniel Vega^{1,6,*}

¹ *Psychiatry and Mental Health Department, Hospital of Igualada. Consorci Sanitari de l'Anoia & Fundació Sanitària d'Igualada, Barcelona (Spain)*

² *Brain, Cognition and Behavior PhD Program, University of Barcelona (Spain)*

³ *Mental Health and Social Innovation Research Group and Centre for Health and Social Care Research, Universitat de Vic – Universitat Central de Catalunya, Catalonia (Spain)*

⁴ *Department of Psychiatry, Hospital de la Santa Creu i Sant Pau, Barcelona (Spain)*

⁵ *Centro de Investigación Biomédica en Red de Salud Mental, CIBERSAM, Madrid (Spain)*

⁶ *Department of Psychiatry and Forensic Medicine, Institute of Neurosciences, School of Medicine, Universitat Autònoma de Barcelona, Bellaterra, Barcelona (Spain)*

Título: Autolesión no suicida en adultos jóvenes con y sin trastorno límite de la personalidad: el papel de la desregulación emocional y la urgencia negativa.

Resumen: La Autolesión No Suicida (ANS) se define como un dolor autoinfligido que se utiliza como un mecanismo para aliviar la angustia psicológica. Aunque ANS es común en el trastorno límite de la personalidad (TLP), también es un problema creciente en estudiantes universitarios. Si bien la desregulación emocional y la urgencia negativa están asociadas con ANS, poco se sabe sobre las dimensiones específicas que predicen la motivación (funciones) y la frecuencia de las autolesiones. Se exploró la relación entre la desregulación emocional, la urgencia negativa, y ANS en 86 adultos jóvenes, divididos en tres grupos: estudiantes universitarios con ANS, pacientes TLP con ANS y un grupo de control sano sin ANS. Realizamos análisis de regresión múltiple para predecir las funciones y frecuencia de ANS. La no aceptación de las emociones, una dimensión específica de la desregulación emocional, predijo de manera única las funciones intrapersonales de ANS, pero no las funciones interpersonales. Por último, la falta de estrategias de regulación emocional predijo la frecuencia de ANS solo en individuos con una alta urgencia negativa, es decir, individuos que tienden a actuar impulsivamente cuando experimentan emociones negativas, pero no en aquellos con una baja urgencia negativa. Los hallazgos resaltan las motivaciones subyacentes a la autolesión y revelan facetas de la desregulación emocional relevantes para el tratamiento de ANS.

Palabras clave: Autolesión. Desregulación emocional. Urgencia negativa. Funciones de la autolesión.

Abstract: Non-suicidal self-injury (NSSI) is defined as self-inflicted pain, and it is used as a mechanism to alleviate psychological distress. Although NSSI is prevalent in Borderline Personality Disorder (BPD), it is also an increasing concern among college student populations. While emotion dysregulation and negative urgency are associated with NSSI, little is known about which dimensions specifically predict the motivations (NSSI-functions) and frequency of self-harm. The current study explored the relationship between emotion dysregulation, negative urgency, and NSSI in 86 young adults, divided into three groups: college students with NSSI, BPD patients with NSSI, and a healthy control group without NSSI. We conducted multiple regression analyses to predicted NSSI-functions and NSSI-frequency. Non-acceptance of emotions, a specific dimension of emotion dysregulation, uniquely predicted intrapersonal NSSI-functions (e.g., regulating distressing emotions), but not interpersonal NSSI-functions (e.g., communicating distress). Lastly, poor emotion regulation strategies predicted NSSI-frequency only in individuals with high negative urgency, that is, individuals who tend to act impulsively when experiencing negative emotions, but not in those with low negative urgency. Findings shed light on the underlying motivations for engaging in self-injury, and they reveal facets of emotion dysregulation relevant for NSSI treatment.

Keywords: Self-harm. Emotion dysregulation. Negative urgency. Self-harm functions.

Introduction

Non-suicidal self-injury (NSSI) is broadly defined as the self-inflicted destruction of body tissue in the absence of suicidal intent (Nock, 2010). It affects between 13% and 32% of adolescents and young adults in community samples (Muehlenkamp et al., 2012; Swannell et al., 2014), becoming a growing public health concern. Alarmingly, NSSI has been associated with interpersonal difficulties, high levels of psychological suffering, and high risk for suicide (Ribeiro et al., 2016; Vega et al., 2018). While growing research has significantly increased knowledge about NSSI, the factors involved in the motivations of this high-risk behavior (i.e., functions of NSSI) have yet to be fully elucidated.

Previous studies have supported a two-factor higher-order model to explain functions of NSSI. On the one hand,

intrapersonal NSSI-functions involve motivations associated with changes in one's internal state, such as an emotional state or thoughts (e.g., affect regulation) and, on the other hand, interpersonal functions involve motivations associated with changes in the external environment (e.g., interpersonal influence: Klonsky et al., 2015; Turner et al., 2012). Among the wide range of NSSI functions commonly reported by people who engage in self-injury, intrapersonal functions are the most prevalent, indicating that individuals typically engage in self-injury to cope with inner tension (Taylor et al., 2018). Consistently, previous results show that intrapersonal functions are related to high emotional reactivity as well as poor emotion regulation skills, while interpersonal functions are mainly associated with social difficulties (Andover, 2014; Turner et al., 2012). For example, in a sample of college students, individuals with high levels of emotion dysregulation reported that they engaged in NSSI mainly with an intrapersonal motivation, whilst those reporting greater difficulties in social relationships incurred in NSSI more commonly with an interpersonal motivation (Vega et al., 2017).

Although emotion dysregulation is considered an important transdiagnostic risk factor for a wide range of psy-

* Correspondence address [Dirección para correspondencia]:

Daniel Vega Psychiatry and Mental Health Department, Consorci Sanitari de l'Anoia & Fundació Sanitària d'Igualada, Hospital Universitari d'Igualada. Av. Catalunya 11, Barcelona, Igualada 08700 (Spain).

E-mail: daniel.vegamo@gmail.com

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chopathology in adolescents and adults (Aldao et al., 2010; Sheppes et al., 2015), previous work has reported a specific robust association between emotion (dys)regulation and NSSI (Fox et al., 2015; Wolff et al., 2019). In this regard, individuals who incur in NSSI exhibit poor emotion regulation compared to non-NSSI individuals (Taylor et al., 2018), and the degree of emotion dysregulation is correlated with the frequency of NSSI (Andover, 2014).

It is therefore not surprising that NSSI is strongly related to emotional disorders such as Borderline Personality Disorder (BPD) (Glenn & Klonsky, 2013). Affective dysregulation and poor emotion regulation skills are principal characteristics of BPD (Linehan, 1993). The emotional cascade model suggests that individuals with BPD experience intense negative affect and excessive rumination that may motivate engaging in dysregulated behaviors (e.g., self-injury) to reduce emotional arousal (Selby & Joiner, 2009).

Closely related to emotion dysregulation, negative urgency is an impulsivity trait that is conceptualized as a disposition or a proclivity to act rashly when experiencing strong negative emotions (Cyders & Smith, 2008). Most importantly, negative urgency is implicated in NSSI (Peckham et al., 2020). Engaging in NSSI has been associated with higher scores in negative urgency (Bresin et al., 2013), indicating a difficulty to control the urge to hurt oneself when experiencing negative emotions. In addition, a prospective study revealed that adolescents with baseline negative urgency are more vulnerable to later engagement in NSSI (You et al., 2016).

While negative urgency has been identified as the impulsivity measure that is most robustly associated with NSSI (Hamza et al., 2015), some dimensions of emotion dysregulation have also been established as more relevant for NSSI than other dimensions. For example, a meta-analysis concluded that limited access to emotion regulation strategies, followed by nonacceptance of emotions, were most robustly associated with NSSI engagement (Wolff et al., 2019). Additionally, a recent study has reported that adolescents with severe NSSI show higher negative affect, less emotion regulation strategies, and more difficulties with impulse control, relative to their less severely affected counterparts (Chen & Chun, 2019). Collectively, these findings highlight the importance of considering measures of both emotion dysregulation and impulsivity to better characterize NSSI behavior.

Notwithstanding the above, there is a dearth of literature exploring the role of specific dimensions of emotion regulation in the engagement of NSSI and with regards to the motivation (intrapersonal vs. interpersonal function) of NSSI. A better understanding of this relationship, both in clinical and nonclinical samples, may help refine interventions for individuals who engage in self-injury. To bridge the gap in extant literature, the current study aimed to investigate the association of specific dimensions of emotion dysregulation with the functions and frequency of NSSI, in a sample of young adults. Innovatively, we included both a clinical group of pa-

tients with BPD and NSSI and a subclinical group of college students with NSSI.

Based on prior research suggesting that NSSI is associated with poor emotion regulation skills (Taylor et al., 2018; Wolff et al., 2019; Fox et al., 2016), it was hypothesized that participants with NSSI (both the clinical and subclinical groups) would present more clinical symptoms and more difficulties with emotion regulation relative to the healthy control group. In turn, this would indicate that NSSI is associated with a worse clinical status and higher emotion dysregulation (hypothesis 1). Second, it was predicted that emotion (dys)regulation (assessed by DERS subscales) would show a strong positive association with intrapersonal functions of NSSI and a weaker or no association with interpersonal functions of NSSI. Specifically, given recent meta-analytic findings (Wolff et al., 2019), it was postulated that limited access to emotion regulation strategies and non-acceptance of emotions would be more strongly associated with intrapersonal (i.e., affect-regulating) functions of NSSI and frequency of NSSI (hypothesis 2). Lastly, given prior findings portraying negative urgency as a vulnerability factor for self-harm (You et al., 2016), it was anticipated that negative urgency would predict NSSI frequency (hypothesis 3). Given no prior research regarding the role of negative urgency in motivations for self-harm, exploratory analyses were conducted to explore whether this impulsivity construct would predict intrapersonal or interpersonal NSSI-functions.

Materials and Methods

Participants and procedures

The sample consisted of 86 young adults (aged 18 to 33 years old), divided into three groups: (i) 25 college students with NSSI (ST-NSSI group), (ii) 30 patients with BPD and NSSI (BPD-NSSI group), and (iii) 31 healthy controls with no history of any mental disorder or NSSI (HC group). Participants were recruited from different sources. All participants underwent the Structured Clinical Interview for DSM IV Axis II Disorders (SCID-II) (First et al., 1997) and the Diagnostic Interview for Borderlines-Revised (DIB-R) (Barrachina et al., 2004). Using these two clinical interviews, an experienced clinical psychologist with a PhD conducted the assessment in order to confirm (for BPD patients) or discard (for students) the BPD diagnosis criteria based on the SCID-II and DIB-R. Also, both ST-NSSI and BPD-NSSI participants fulfilled the DSM-5 diagnostic criteria for the DSM-5 (American Psychiatric Association, 2013) 'non-suicidal self-injury disorder' (Supplemental material). The present study is part of a larger study for which all participants received monetary compensation (€30-50). All procedures were approved by the corresponding Clinical Research Ethics Committee the study was conducted in accordance with the Declaration of Helsinki.

College student sample (ST-NSSI group)

This group included college students from Igualada (Barcelona) who studied engineering and social sciences and agreed to take part in the research voluntarily and anonymously. A total of 180 students completed an anonymous assessment including sociodemographic, self-report questionnaires, and a screening of NSSI in a mass session. Those who reported a history of NSSI behaviors were invited to participate in a second stage of the study, and if interested, they were asked to include their email address. Finally, 25 students with a positive NSSI screening (that is, 25 students reported a history of NSSI behaviors) qualified for the study and were included in the analysis. This group was not previously diagnosed with any pathology and did not meet criteria for any personality disorders, as determined by the Structured Clinical Interview (SCID II) (First et al., 1997). Additionally, they were not receiving psychiatric/psychological treatment at the time of evaluation

Group of patients (BPD-NSSI group)

The BPD-NSSI group ($n = 30$) consisted of young patients with BPD and NSSI, who were recruited from the Mental Health Department of Igualada General Hospital. They were patients undergoing psychological treatment at the time of recruitment, and they agreed to participate in the study voluntarily. Diagnosis was based on the DSM-IV-TR and the Diagnostic Interview for Borderlines-Revised (DIB-R) (Barrachina et al., 2004). Exclusion criteria for this group included any presence of brain injury, psychotic, bipolar, current major depressive disorder, and drug abuse.

Healthy control group (HC group)

Healthy control participants ($n = 31$) with no history of NSSI were recruited via local advertisement using social media. Inclusion criteria for this group included: (i) no current psychiatric/psychological treatment, (ii) no current or past mental disorder, (iii) no present or past self-harm behaviors. To ensure that they met these inclusion criteria, healthy control participants completed a clinical interview in a single session with an expert clinician.

Measures

Inventory of Statements About Self-Injury (ISAS) (Klonsky & Glenn, 2009). This inventory consists of two sections. The first one assesses lifetime frequency of 12 NSSI behaviors (e.g., Cutting). Participants who endorsed one or more NSSI behaviors were then instructed to complete a second section of the inventory, which assesses 13 NSSI functions. These functions are grouped into two separate factors that index interpersonal (e.g., interpersonal influence, self-care) and intrapersonal NSSI functions (e.g., affect-regulation, anti-suicide) (Klonsky & Glenn, 2009). We used the Spanish ver-

sion of the ISAS which shows good internal reliability for both Interpersonal and Intrapersonal scales ($\alpha = 0.87$ and $\alpha = 0.90$, respectively) (Vega et al., 2017).

The Borderline Personality Questionnaire (BPQ) (Poreh et al., 2006). This is a self-report questionnaire that assesses BPD based on DSM-IV criteria. It consists of 80 statements, distributed over nine subscales: Impulsiveness, Affective Instability, Abandonment, Relationship, Self-Image, Suicide/Self-Mutilation, Emptiness, Intense Anger, and Quasi-Psychotic States. The Spanish version of the BPQ presents moderate to high internal reliability (Cronbach's $a = .78$ to $.93$) for all nine scales (Fonseca-Pedrero et al., 2011). BPQ is a good screening tool for the diagnosis of BPD in outpatient youth (Chanen et al., 2008). In this study, the total BPQ score was used as a measure of the severity of borderline personality symptoms. A higher total BPQ score indicated higher or more severe BPD symptoms.

Depression Anxiety Stress Scales (DASS-21) (Bados et al., 2005). The DASS-21 is a self-report instrument that assesses the intensity/frequency of 21 negative emotional symptoms during the previous week, distributed over three subscales: Depression, Anxiety, and Stress. The Spanish version presents moderate to good internal reliability (Cronbach's $\alpha = 0.84$, 0.70 and 0.82) for each of the three scales, respectively (Bados et al., 2005).

Brief Version of the Difficulties in Emotion Regulation Scale (DERS-18) (Victor & Klonsky, 2016). DERS-18 is the abbreviated version of the Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004). The 18-item short-form maintains a similar structure to the 36-item DERS, with 6 subscales that assess emotion regulation difficulties: (i) lack of emotional awareness, (ii) lack of emotional clarity, (iii) nonacceptance of emotions, (iv) inability to engage in goal-directed behavior when feeling emotional, (v) engagement in impulsive behavior when feeling emotional, and (vi) inability to access emotion regulation strategies. The total DERS score presents a high internal reliability (Cronbach's $a = .91$) and the six scales present moderate to high internal reliability (Cronbach's $a = .77$ to $.90$) (Victor & Klonsky, 2016).

Urgency-Premeditation-Perseverance-Sensation Seeking-Positive Urgency Impulsive Behavior Scale (UPPS-P) (Verdejo-García et al., 2010). UPPS-P is a 59-item inventory that measures five distinct features of impulsive behavior. In the present study, we used only the negative urgency scales (see supplemental material for additional information). The urgency subscale consists of 12 items and it presents a good internal reliability (Cronbach's $a = .87$) in the Spanish version (Verdejo-García et al., 2010).

Statistical analysis

First, all continuous variables (ISAS, BPQ, DASS-21, DERS, UPPS-P-Negative Urgency) were assessed for normality and outliers. The scores for DASS-21 and DERS subscales were not normally distributed. NSSI-lifetime frequen-

cy and Intrapersonal functions of the ISAS were also non-normally distributed. Second, differences between groups for sociodemographic and self-report measures were evaluated; for categorical variables, Pearson's Chi-square test (χ^2) was used, whereas for continuous variables one-way ANOVA was used when the assumption of normality was met, and non-parametric Kruskal-Wallis test was used when the assumption of normality was not met. In these analyses, self-report measures were included as within-subjects factors (BPQ, DERS, UPPS-P, DASS-21), and Group (BPD-NSSI, ST-NSSI, HC) as between-subjects factor. A post-hoc analysis was also performed using pairwise comparisons (Bonferroni correction) or Games-Howell tests, where applicable. Third, differences in NSSI-functions between BPD-NSSI and ST-NSSI groups were evaluated by using the Mann-Whitney and Wilcoxon non-parametric test. Finally, hierarchical multiple regression analyses were performed to evaluate whether measures of emotion dysregulation (DERS-subcales) and impulsivity (UPPS-P-Negative Urgency) were significant predictors of NSSI-functions and NSSI-lifetime frequency. Natural logarithm in NSSI-lifetime frequency and square-root transformations in the Interpersonal functions of ISAS and DERS subscales were used to achieve normal

distribution. The descriptive analyses were performed with SPSS-21 and statistical tests were performed with RStudio Version 1.1.463.

Results

Demographics and NSSI-characteristics

Demographical information and NSSI characteristics are shown in Table 1 and psychometric properties of scales in Table S1. The three groups were matched by age ($\chi^2 = 2.83$, $p = .24$) and sex ($\chi^2 = .60$, $p = .74$). The HC group had more years of formal education than the BPD-NSSI and ST-NSSI groups. Regarding NSSI-functions within self-harm groups, intrapersonal functions were significantly more prevalent than interpersonal functions both in BPD-NSSI ($Z = -4.45$, $p < .001$) and ST-NSSI group ($Z = -4.37$, $p < .001$). Between-group analysis can be found in Table S2. Notably, intrapersonal NSSI-functions were significantly more prevalent in the BPD-NSSI group than in the ST-NSSI group and, specifically, anti-suicide NSSI-function was higher in the BPD-NSSI group. There were no significant differences in interpersonal NSSI-functions between groups.

Table 1
Sociodemographic characteristics.

	BPD-NSSI (<i>n</i> = 30)	ST-NSSI (<i>n</i> = 25)	HC (<i>n</i> = 31)	Analysis χ^2/Z	χ^2	<i>p</i> -value
Age (mean, <i>SD</i>)	23.57 (4.5)	20.92 (1.4)	23.26 (4.2)	2.83		.24
Sex (female, %)	90 %	84 %	83.9 %		.60	.74
Education years (mean, <i>SD</i>)	12.30 (1.5)	12.80 (1.6)	14.38 (2.9)	6.85		< .05
Employment (Working, %)	26.1 %	40 %	36.7 %		1.11	.57
NSSI features (mean, <i>SD</i>):						
Age of onset NSSI (years)	14.73 (4.7)	13.22 (2.3)	-	-1.10		.27
Frequency (Lifetime)	291.74 (356.7)	194.48 (239.8)	-	-1.01		.31
No. Method (range 1-12)	6.08 (2.5)	5.80 (2.5)	-	-42		.66

Note. BPD-NSSI = Border Personality Disorder with Non-suicidal self-injury; ST-NSSI = Student with Non-suicidal self-injury; HC = healthy control group; Others = unemployment or sickness disability.

χ^2 = Kruskal-Wallis test; *Z* = U Mann-Whitney test.

NSSI, emotion dysregulation, and clinical symptoms in 3 groups (hypothesis 1)

Table 2 illustrates between-group differences in clinical measures. As shown, BPD patients with NSSI (BPD-NSSI group) and college students with NSSI (ST-NSSI group) scored higher than healthy controls on all scales, suggesting a higher clinical severity associated with the presence of NSSI. Additionally, the BPD-NSSI group scored higher than the ST-NSSI group in Negative Urgency (UPPS-P), symptoms

of Depression (DASS-21), and inability to access emotion regulation Strategies (DERS). No differences (BPD-NSSI vs. ST-NSSI) were found in levels of emotion dysregulation (except on lack of emotion regulation strategies), suggesting that the presence of NSSI is associated with poor emotion regulation. Importantly, BPQ discriminated between the three groups, and specifically, the ST-NSSI group differed significantly from the BPD-NSSI group in borderline pathology.

Table 2
Multiple comparisons for the three groups in self-report measures.

	BPD-NSSI (<i>n</i> = 30)	ST-NSSI (<i>n</i> = 25)	HC (<i>n</i> = 31)	Analysis		
	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	<i>F</i> test/ χ^2 †	η^2	Post-hoc
BPQ						
BPD symptoms	54.00 (10.7)	39.52 (14.4)	12.41 (8.3)	107.67***	.72	BPD > ST > HC
UPPS-P						
Negative Urgency	37.17 (5.2)	31.77 (6.1)	24.16 (4.7)	45.69***	.53	BPD > ST > HC
DASS-21						
Depression	14.32 (5.3)	9.25 (5.8)	1.52 (1.7)	51.91***	.59	BPD > ST > HC
Anxiety	10.96 (5.5)	7.54 (5.0)	1.39 (1.6)	43.78***	.48	BPD = ST > HC
Stress	14.04 (4.8)	11.92 (5.5)	3.39 (3.1)	44.86***	.53	BPD = ST > HC
DASS total	39.32 (14.3)	28.71 (14.7)	6.29 (5.9)	50.66***	.59	BPD > ST > HC
DERs-18						
Awareness	9.37 (2.8)	9.72 (2.4)	6.13 (2.0)	19.01***	.34	BPD = ST > HC
Clarity	11.17 (2.9)	11.16 (2.8)	5.61 (2.4)	42.28***	.48	BPD = ST > HC
Goals	12.80 (2.6)	11.36 (2.5)	6.97 (2.3)	42.67***	.45	BPD = ST > HC
Impulse	7.16 (3.8)	8.68 (3.5)	4.00 (1.6)	39.64***	.42	BPD = ST > HC
Nonacceptance	10.10 (4.1)	8.08 (4.0)	4.61 (2.5)	29.33***	.32	BPD = ST > HC
Strategies	11.23 (2.9)	8.52 (4.0)	4.03 (2.2)	45.48***	.49	BPD > ST > HC
DERs total	63.83 (11.3)	57.52 (11.6)	31.35 (8.3)	54.61***	.62	BPD = ST > HC

Note. BPD-NSSI = Borderline Personality Disorder with Non-Suicidal Self-Injury; ST-NSSI = Student with Non-suicidal self-injury; HC = healthy control group; BPQ = Borderline Personality Questionnaire; UPPS = The Impulsivity Scale; DASS-21 = Depression, Anxiety and Stress Scale; DERs-18 = Difficulties in Emotion Regulation Scale.

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

† = Kruskal-Wallis test.

Emotion dysregulation, Negative Urgency and NSSI-functions (hypothesis 2)

We assessed whether difficulties in emotion regulation are differentially associated with intrapersonal and interpersonal NSSI functions (Table 3). In these analyses, we controlled for Group (BPD-NSSI vs. ST-NSSI) to account for potential differences associated with the presence of a BPD diagnosis. In addition, since significant correlations were observed between predictors, we assessed multicollinearity by calculating the variance inflation factor (VIF). All VIF values were under 3, indicating that there were no multicollinearity problems (Hair, 2010).

First, we used NSSI-intrapersonal functions as the outcome variable. We entered Group and DERs-scales (Awareness, Clarity, Goals, Impulse, Nonacceptance, Strategies) as predictors. Results showed that only the lack of acceptance of one’s emotions (i.e., Nonacceptance DERs-scale) significantly predicted NSSI-intrapersonal functions ($R^2 = .47$, $F(7, 43) = 5.64$, $p < .001$).

We repeated the previous analysis with NSSI-interpersonal functions as the outcome. When Group (BPD-NSSI vs. ST-NSSI) and DERs-scales were entered simultaneously as predictors, none of these variables significantly predicted NSSI-interpersonal functions. However, there was a moderate trend for clarity about the nature of one’s emotions (i.e., Clarity DERs-scale) (Table 3).

We also evaluated whether Negative urgency, together with Group (BPD-NSSI vs. ST-NSSI), significantly predicted intrapersonal and interpersonal NSSI-functions. Surprisingly, negative urgency did not predict any NSSI-functions (all $p > .17$).

All analyses were repeated using BPQ (i.e., severity of borderline symptoms) as an additional covariate, and results remained the same (supplementary material). Collectively, these results suggest that individuals with high negative urgency in the current sample are not more likely to incur to NSSI with an intrapersonal or an interpersonal motivation. However, results also suggest that out of all emotion regulation difficulties (DERs-scales), participants with specific difficulties in acceptance of emotions were more likely to engage in NSSI with an intrapersonal motivation, even after controlling for BPD severity.

Frequency of NSSI: Emotion dysregulation and Negative urgency (hypothesis 3)

According to hypothesis 3, we explored whether DERs-scales and Negative Urgency could potentially predict NSSI-lifetime frequency. In a first model, Group (BPD-NSSI vs. ST-NSSI) and DERs-scales were entered simultaneously as predictors, yet none of these scales predicted NSSI-lifetime frequency (all $p > .13$). Lastly, when negative urgency was included in a second model with Group as a control variable, it showed no predictive effect on NSSI-lifetime frequency (all $p < .62$).

Additionally, we examined possible interactions between DERs-scales and Negative urgency. Results revealed a significant interaction between Strategies DERs-scale and Negative urgency in predicting NSSI-lifetime frequency (Strategies by Urgency = $.32$, $p < .05$; $R^2 = .20$, $F(3, 40) = 3.46$, $p < .05$), even after controlling for BPQ ($R^2 = .21$, $F(4, 39) = 2.71$, $p < .05$). To decompose the interaction, we conducted simple slopes analysis to assess whether Strategies DERs-

scale predicts NSSI-lifetime frequency for individuals with high and low Negative urgency (Preacher et al., 2006). We draw on previous studies to consider Negative Urgency as a moderator (Bresin et al., 2013). First, we mean-centered the two predictors of the interaction and then estimated individ-

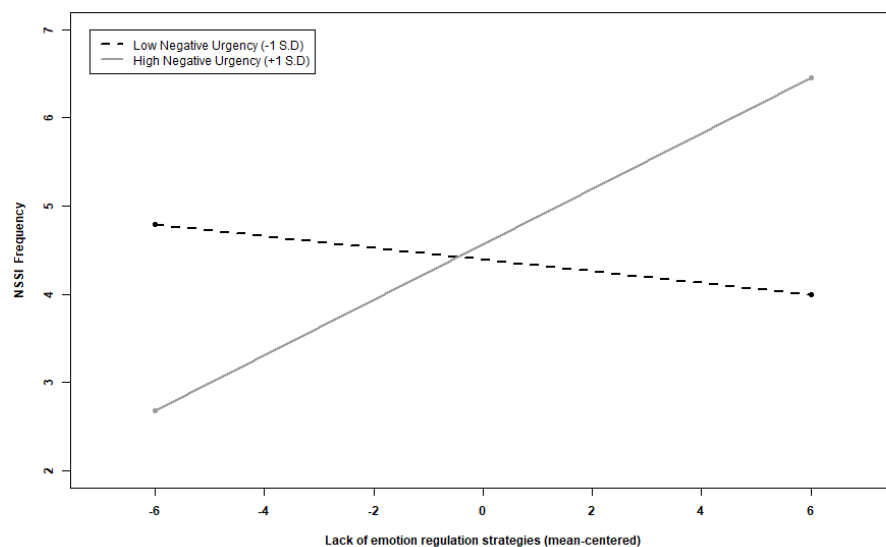
uals with high and low (± 1 S.D) negative urgency. We found that DERS-strategies was significantly associated with NSSI-lifetime frequency ($B = .24, p < .05$) in individuals with high negative urgency, but not in individuals with low negative urgency ($B = -.04, p = .58$) (Figure 1).

Table 3
Multiple linear regression analysis.

	ISAS Intrapersonal function				ISAS Interpersonal function			
	B	SE B	β	P-value	B	SE B	β	P-value
	BPD-NSSI and ST-NSSI groups ($n = 51$)							
Model	(1)				(2)			
Group (BPD vs. ST)	.48	.30	1.59	.11	-.07	.12	-0.61	.53
Awareness	.28	.34	.82	.41	-.09	.14	-.64	.52
Clarity	.08	.36	.23	.81	.30	.15	1.98	.05
Goals	-.30	.44	-.67	.50	-.13	.18	-.71	.48
Impulse	.28	.29	.95	.34	.18	.12	1.44	.15
Nonacceptance	.87	.23	3.75	< .001	.04	.09	.47	.63
Strategies	.41	.33	1.24	.22	.14	.14	1.00	.31

Note. ISAS = Inventory of Statements about Self-Injury; BPQ = The Borderline Personality Questionnaire.

Figure 1
Association between Lack of Emotion Regulation Strategies and NSSI-frequency moderated by Negative Urgency.



Discussion

Innovatively, the present study investigated whether specific dimensions of emotion dysregulation and negative urgency are differentially associated with NSSI functions and NSSI frequency. Innovatively, we recruited both a clinical and a subclinical group of young adults characterized by frequent NSSI engagement (and a group of healthy controls). Our findings indicate that a specific dimension of emotion dysregulation, namely nonacceptance of emotions, uniquely predicted intrapersonal motivations for engaging in NSSI, even after controlling for BPD symptom severity. Importantly, results also revealed an interaction between lack of emotion regulation strategies and negative urgency in predicting NSSI-frequency.

While not previously documented, the unique association of nonacceptance of emotions (DERS-scale) with intrapersonal NSSI-functions may cohere with prior work in the field. For instance, a recent meta-analysis (Taylor et al., 2018) found that individuals most commonly engage in self-injury with an intrapersonal motivation (between 66 to 81%), most commonly to avoid or escape distressing emotions. A lack of acceptance of emotions implies rejecting states of distress by attempting to extinguish the emotion altogether or responding to the emotion with secondary negative emotions such as shame or guilt (Gratz & Roemer, 2004). Accordingly, non-acceptance of emotions could be perceived as an experiential avoidance strategy that may promote engaging in NSSI when individuals are faced with intense negative emotions (Chapman et al., 2006; Selby & Joiner, 2009). In-

deed, previous studies have found that experiential avoidance and thought suppression strategies -constructs related to nonacceptance of emotions (Gratz & Roemer, 2004)- have been associated with an increased risk of NSSI (Chapman et al., 2005, 2006). Importantly, nonacceptance of emotions has also been associated with an increased risk of maintenance of NSSI. Compared to college students who stopped engaging in self-injury one year ago, students who continued engaging in NSSI behaviors showed significantly less acceptance of emotional responses, regardless of gender (Anderson & Crowther, 2012). Interestingly, efforts to suppress or avoid a negative emotion may have a counter-effect, increasing rather than decreasing psychological distress (Kashdan et al., 2006). Therefore, recurrent use of these strategies in the presence of high-intensity emotions may serve as a stepping-stone towards other maladaptive strategies, such as NSSI, when emotional avoidance alone is no longer effective.

Consistent with our hypothesis, we did not find a significant association between any emotion dysregulation dimensions and interpersonal NSSI-functions. As reported in previous literature, interpersonal motivations for NSSI are less common (Taylor et al., 2018), especially among individuals with high levels of emotion dysregulation (Vega et al., 2017), as is the case in the current sample. Interpersonal NSSI functions such as communicating distress or seeking support (Taylor et al., 2018) reflect deficits in interpersonal emotion regulation skills that are not necessarily captured by the DERS scale. Only lack of emotional clarity DERS-scale approached a significant association with interpersonal NSSI-functions. This trend may reflect deficits in identification and communication of emotions (Gratz & Roemer, 2004; Gross, 2015), which may stem from invalidating environments and dysfunctional parenting that detriment the emotion regulation capacity (Crowell et al., 2009; Linehan, 1993). Indeed, a recent study found that an invalidating environment characterized by childhood maltreatment was specifically related to deficits in emotional clarity, which were in turn associated with increased probability of NSSI in young adults (Guérin-Marion et al., 2020). These deficits, added to a context of interpersonal conflicts (Adrian et al., 2011), may motivate engagement in NSSI. However, these relationships should be explored in larger samples.

Additionally, we found that the association between lack of emotion regulation strategies (DERS-dimension) and NSSI-frequency was moderated by negative urgency. Specifically, among individuals who reported a lack of emotion regulation strategies, only those with higher negative urgency, that is, a proclivity to act rashly when experiencing intense negative emotions, were likely to engage in more frequent NSSI. These findings are consistent with meta-analyses that identify limited access to emotion regulation strategies and negative urgency as the most robust predictors of NSSI (Sheppes et al., 2015; You et al., 2016) and with bio-social models that characterize NSSI by emotion dysregulation and impulsivity (Kashdan et al., 2006; Lieb et al., 2004).

Effectively, the observed interaction highlights negative urgency as a critical risk factor for NSSI and corroborates prior research reporting that negative affect, specifically daily sadness, only predicted NSSI engagement in college students with high negative urgency but not with low urgency (Peckham et al., 2020).

Notably, while negative urgency predicted NSSI-frequency (in interaction with lack of emotion regulation strategies), it did not predict motivations for self-harm. This null finding is not surprising, given that negative urgency interferes with NSSI only after NSSI urges surpass a temporal or intensity threshold. As recently study demonstrated, negative urgency in NSSI is not associated with deficits in restraining an emotionally impulsive act before it is initiated, but it is rather associated with deficits in terminating an ongoing negative emotional response after it is initiated (Allen & Hooley, 2019). Such findings suggest that negative urgency may not be involved in the motivations for engaging in NSSI, but it may be involved in readily transforming the NSSI urge into an NSSI act.

Additionally, when comparing the NSSI groups with healthy controls, individuals with NSSI scored higher on all clinical measures. As predicted, the BPD-NSSI group presented higher severity (e.g., psychopathology) than the student group, which is also reflected in the higher prevalence of intrapersonal NSSI-functions. Importantly, both the BPD-NSSI and ST-NSSI groups showed similar levels of emotion dysregulation and did not differ in age onset, frequency, and number of methods used in NSSI. Complementarily, both BPD and student groups engaged in NSSI with intrapersonal functions more frequently than with interpersonal functions, which reflects that the main motivation for NSSI in both groups was to regulate an internal state of emotional distress. These findings are consistent with a study reporting that intrapersonal NSSI-functions are associated with affective dysregulation in college students (Vega et al., 2017). Given the growing prevalence of NSSI among young adults in community populations (Muehlenkamp et al., 2012; Swannell et al., 2014), exploring the characteristics of NSSI in subclinical samples may be particularly pertinent. Findings indicate that the phenotypic characteristics of NSSI may not differ for clinical and subclinical groups with frequent NSSI.

Our results suggest that specific dimensions of emotion dysregulation may provide unique information about different NSSI features. Precisely, nonacceptance of emotions may predict the motivation for engaging in NSSI (i.e., NSSI used as an experiential avoidance strategy), while lack of emotion regulation strategies (in the presence of negative urgency) may predict increased frequency and maintenance of NSSI. Addressing these emotion regulation deficits in therapy could have a direct impact on NSSI. Interestingly, Dialectical Behavioral Therapy (DBT), specifically DBT skills training (Linehan, 1993; 2014), has been shown to effectively reduce NSSI acts (Linehan et al., 2015) by improving acceptance skills (Krantz et al., 2018). Therefore, therapeutic interventions which target emotion acceptance and emotion

regulation (e.g., DBT) may be a necessary goal for patients with NSSI. Correspondingly, by learning acceptance and mindfulness skills, patients can learn to tolerate disruptive emotions that can trigger urgency of NSSI, and by learning emotion regulation skills they can learn to identify and describe emotions that precede the NSSI act and obtain greater cognitive and behavioral control (Linehan et al., 2014).

Despite promising findings, this study has some important limitations that need to be addressed to inform cautious interpretation of the data. Firstly, the low sample size may have led to less robust estimates as well as some null findings, therefore the results presented should be confirmed by future research with larger sample sizes. Secondly, the BPD-NSSI and ST-NSSI groups demonstrated considerable homogeneity in emotion dysregulation, which may have attenuated associations and reduced power to detect subtle differences. Also, our data is based on self-reports, therefore, information about retrospective NSSI may be under or overestimated (or may entail memory biases). In addition, the clinical measures only assessed the past few weeks, while NSSI-frequency was measured over a longer timeframe; therefore, comparison of these measures could be biased. Ecological momentary assessment may offer a better alternative to capture clinical information related to NSSI acts in

real time. Lastly, we used a cross-sectional design, whereas longitudinal studies could be more informative of the NSSI trajectory.

Conclusion

Results reveal facets of emotion dysregulation that are uniquely associated with the functions and frequency of NSSI and they highlight the need for emotion regulation skills and distress tolerance (to prevent negative urgency) as a common treatment target in psychotherapy. While preliminary, our findings are expected to have clinical implications and may serve as a guide for more proactive interventions, especially in subclinical groups of people with NSSI.

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References

- Adrian, M., Zeman, J., Erdley, C., Lisa, L., & Sim, L. (2011). Emotional dysregulation and interpersonal difficulties as risk factors for nonsuicidal self-injury in adolescent girls. *Journal of Abnormal Child Psychology*, *39*(3), 389–400. <https://doi.org/10.1007/s10802-010-9465-3>
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237. <https://doi.org/10.1016/j.cpr.2009.11.004>
- Allen, K. J. D., & Hooley, J. M. (2019). Negative Emotional Action Termination (NEAT): Support for a cognitive mechanism underlying negative urgency in nonsuicidal self-injury. *Behavior Therapy*, *50*(5), 924–937. <https://doi.org/10.1016/j.beth.2019.02.001>
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders*. American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, N. L., & Crowther, J. H. (2012). Using the experiential avoidance model of non-suicidal self-injury: understanding who stops and who continues. *Archives of Suicide Research: Official Journal of the International Academy for Suicide Research*, *16*(2), 124–134. <https://doi.org/10.1080/13811118.2012.667329>
- Andover, M. S. (2014). Non-suicidal self-injury disorder in a community sample of adults. *Psychiatry Research*, *219*(2), 305–310. <https://doi.org/10.1016/j.psychres.2014.06.001>
- Bados, A., Solanas A., & Andrés, R. (2005). Psychometric properties of the Spanish version of Depression, Anxiety and Stress Scales (DASS). *Psicothema*, *17*(4), 679–683.
- Barrachina, J., Soler, J., Campins, M. J., Tejero, A., Pascual, J. C., Alvarez, E., Zanarini, M. C., & Pérez Sola, V. (2004). [Validation of a Spanish version of the Diagnostic Interview for Borderlines-Revised (DIB-R)]. *Actas Espanolas de Psiquiatria*, *32*(5), 293–298. <http://www.ncbi.nlm.nih.gov/pubmed/15529214>
- Bresin, K., Carter, D. L., & Gordon, K. H. (2013). The relationship between trait impulsivity, negative affective states, and urge for nonsuicidal self-injury: a daily diary study. *Psychiatry Research*, *205*(3), 227–231. <https://doi.org/10.1016/j.psychres.2012.09.033>
- Chanen, A. M., Jackson, H. J., McCutcheon, L. K., Jovev, M., Dudgeon, P., Yuen, H. P., Germano, D., Nistico, H., McDougall, E., Weinstein, C., Clarkson, V., & McGorry, P. D. (2008). Early intervention for adolescents with borderline personality disorder using cognitive analytic therapy: randomised controlled trial. *The British Journal of Psychiatry: The Journal of Mental Science*, *193*(6), 477–484. <https://doi.org/10.1192/bjp.bp.107.048934>
- Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self-harm: the experiential avoidance model. *Behaviour Research and Therapy*, *44*(3), 371–394. <https://doi.org/10.1016/j.brat.2005.03.005>
- Chapman, A. L., Specht, M. W., & Cellucci, T. (2005). Borderline personality disorder and deliberate self-harm: Does experiential avoidance play a role? *Suicide and Life-Threatening Behavior*, *35*(4), 388–399. <https://doi.org/10.1521/suli.2005.35.4.388>
- Chen, W.-L., & Chun, C.-C. (2019). Association between emotion dysregulation and distinct groups of non-suicidal self-injury in Taiwanese female adolescents. *International Journal of Environmental Research and Public Health*, *16*(18), 3361. <https://doi.org/10.3390/ijerph16183361>
- Crowell, S. E., Beauchaine, T. P., & Linehan, M. M. (2009). A biosocial developmental model of borderline personality: Elaborating and extending linehan's theory. *Psychological Bulletin*, *135*(3), 495–510. <https://doi.org/10.1037/a0015616>
- Cyders, M. A., & Smith, G. T. (2008). Emotion-based dispositions to rash action: Positive and negative urgency. *Psychological Bulletin*, *134*(6), 807–828. <https://doi.org/10.1037/a0013341>
- First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B. W., & Benjamin, L. S. (1997). *Structured Clinical Interview for DSM-IV Axis I Personality Disorders (SCID-II)*. American Psychiatric Press.
- Fonseca-Pedrero, E., Paino, M., Lemos-Giráldez, S., Sierra-Baigrie, S., González, M. P. G.-P., Bobes, J., & Muñiz, J. (2011). Borderline personality traits in nonclinical young adults. *Journal of Personality Disorders*, *25*(4), 542–556. <https://doi.org/10.1521/pedi.2011.25.4.542>
- Fox, K. R., Franklin, J. C., Ribeiro, J. D., Kleiman, E. M., Bentley, K. H., & Nock, M. K. (2015). Meta-analysis of risk factors for nonsuicidal self-injury. *Clinical Psychology Review*, *42*, 156–167. <https://doi.org/10.1016/j.cpr.2015.09.002>

- Glenn, C. R., & Klonsky, E. D. (2013). Nonsuicidal self-injury disorder: an empirical investigation in adolescent psychiatric patients. *Journal of Clinical Child and Adolescent Psychology: The Official Journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53*, 42(4), 496–507. <https://doi.org/10.1080/15374416.2013.794699>
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26(1), 41–54. <https://doi.org/10.1023/B:JOBA.0000007455.08539.94>
- Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, 26(1), 1–26. <https://doi.org/10.1080/1047840X.2014.940781>
- Guérin-Marion, C., Martin, J., Lafontaine, M.-F., & Bureau, J.-F. (2020). Invalidating caregiving environments, specific emotion regulation deficits, and non-suicidal self-injury. *Child Psychiatry & Human Development*, 51(1), 39–47. <https://doi.org/10.1007/s10578-019-00908-2>
- Hair, J. F., Black, W. C., Babin, B. J. (Eds.) (2010). *Multivariate data analysis: A global perspective*. Pearson Education.
- Hamza, C. A., Willoughby, T., & Heffer, T. (2015). Impulsivity and nonsuicidal self-injury: A review and meta-analysis. *Clinical Psychology Review*, 38, 13–24. <https://doi.org/10.1016/j.cpr.2015.02.010>
- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy*, 44(9), 1301–1320. <https://doi.org/10.1016/j.brat.2005.10.003>
- Klonsky, E. D., & Glenn, C. R. (2009). Assessing the functions of non-suicidal self-injury: Psychometric properties of the Inventory of Statements About Self-injury (ISAS). *Journal of Psychopathology and Behavioral Assessment*, 31(3), 215–219. <https://doi.org/10.1007/s10862-008-9107-z>
- Klonsky, E. D., Glenn, C. R., Styer, D. M., Olino, T. M., & Washburn, J. J. (2015). The functions of nonsuicidal self-injury: converging evidence for a two-factor structure. *Child and Adolescent Psychiatry and Mental Health*, 9(1), 44. <https://doi.org/10.1186/s13034-015-0073-4>
- Krantz, L. H., McMain, S., & Kuo, J. R. (2018). The unique contribution of acceptance without judgment in predicting nonsuicidal self-injury after 20-weeks of dialectical behaviour therapy group skills training. *Behaviour Research and Therapy*, 104, 44–50. <https://doi.org/10.1016/j.brat.2018.02.006>
- Lieb, K., Zanarini, M. C., Schmahl, C., Linehan, M. M., & Bohus, M. (2004). Borderline personality disorder. *Lancet (London, England)*, 364(9432), 453–461. [https://doi.org/10.1016/S0140-6736\(04\)16770-6](https://doi.org/10.1016/S0140-6736(04)16770-6)
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press.
- Linehan, M. M. (2014). *DBT Skills Training Manual* (2nd ed.). Guilford Press.
- Linehan, M. M., Korslund, K. E., Harned, M. S., Gallop, R. J., Lungu, A., Neacsiu, A. D., McDavid, J., Comtois, K. A., & Murray-Gregory, A. M. (2015). Dialectical behavior therapy for high suicide risk in individuals with borderline personality disorder: a randomized clinical trial and component analysis. *JAMA Psychiatry*, 72(5), 475–482. <https://doi.org/10.1001/jamapsychiatry.2014.3039>
- Muehlenkamp, J. J., Claes, L., Havertape, L., & Plener, P. L. (2012). International prevalence of adolescent non-suicidal self-injury and deliberate self-harm. *Child and Adolescent Psychiatry and Mental Health*, 6, 10. <https://doi.org/10.1186/1753-2000-6-10>
- Nock, M. K. (2010). Self-Injury. *Annual Review of Clinical Psychology*, 6, 339–363. <https://doi.org/10.1146/annurev.clinpsy.121208.131258>
- Peckham, A. D., Jordan, H., Silverman, A., Jarvi Steele, S., Björgvinsson, T., & Beard, C. (2020). From urges to action: Negative Urgency and nonsuicidal self-injury in an acute transdiagnostic sample. *Archives of Suicide Research: Official Journal of the International Academy for Suicide Research*, 24(3), 367–383. <https://doi.org/10.1080/13811118.2019.1625831>
- Poreh, A. M., Rawlings, D., Claridge, G., Freeman, J. L., Faulkner, C., & Shelton, C. (2006). The BPQ: a scale for the assessment of borderline personality based on DSM-IV criteria. *Journal of Personality Disorders*, 20(3), 247–260. <https://doi.org/10.1521/pedi.2006.20.3.247>
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, 31(4), 437–448. <https://doi.org/10.3102/10769986031004437>
- Ribeiro, J. D., Franklin, J. C., Fox, K. R., Bentley, K. H., Kleiman, E. M., Chang, B. P., & Nock, M. K. (2016). Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: a meta-analysis of longitudinal studies. *Psychological Medicine*, 46(2), 225–236. <https://doi.org/10.1017/S0033291715001804>
- Selby, E. A., & Joiner, T. E. (2009). Cascades of emotion: the emergence of borderline personality disorder from emotional and behavioral dysregulation. *Review of General Psychology*, 13(3), 219–229. <https://doi.org/10.1037/a0015687>
- Sheppes, G., Suri, G., & Gross, J. J. (2015). Emotion regulation and psychopathology. *Annual Review of Clinical Psychology*, 11, 379–405. <https://doi.org/10.1146/annurev-clinpsy-032814-112739>
- Swannell, S. V., Martin, G. E., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in nonclinical samples: systematic review, meta-analysis and meta-regression. *Suicide & Life-Threatening Behavior*, 44(3), 273–303. <https://doi.org/10.1111/sltb.12070>
- Taylor, P. J., Jomar, K., Dhingra, K., Forrester, R., Shahmalak, U., & Dickson, J. M. (2018). A meta-analysis of the prevalence of different functions of non-suicidal self-injury. *Journal of Affective Disorders*, 227, 759–769. <https://doi.org/10.1016/j.jad.2017.11.073>
- Turner, B. J., Chapman, A. L., & Layden, B. K. (2012). Intrapersonal and interpersonal functions of non suicidal self-injury: associations with emotional and social functioning. *Suicide & Life-Threatening Behavior*, 42(1), 36–55. <https://doi.org/10.1111/j.1943-278X.2011.00069.x>
- Vega, D., Sintes, A., Fernández, M., Puntí, J., Soler, J., Santamarina, P., Soto, A., Lara, A., Méndez, I., Martínez-Giménez, R., Romero, S., & Pascual, J. C. (2018). Review and update on non-suicidal self-injury: who, how and why? *Actas Espanolas de Psiquiatria*, 46(4), 146–155. <http://www.ncbi.nlm.nih.gov/pubmed/30079928>
- Vega, D., Torrubia, R., Soto, A., Ribas, J., Soler, J., Pascual, J. C., Rodríguez-Fornells, A., & Marco-Pallarés, J. (2017). Exploring the relationship between non suicidal self-injury and borderline personality traits in young adults. *Psychiatry Research*, 256, 403–411. <https://doi.org/10.1016/j.psychres.2017.07.008>
- Verdejo-García, A., Lozano, O., Moya, M., Alcázar, M. A., & Pérez-García, M. (2010). Psychometric properties of a Spanish version of the UPPS-P impulsive behavior scale: reliability, validity and association with trait and cognitive impulsivity. *Journal of Personality Assessment*, 92(1), 70–77. <https://doi.org/10.1080/00223890903382369>
- Victor, S. E., & Klonsky, E. D. (2016). Validation of a Brief Version of the Difficulties in Emotion Regulation Scale (DERS-18) in five samples. *Journal of Psychopathology and Behavioral Assessment*, 38(4), 582–589. <https://doi.org/10.1007/s10862-016-9547-9>
- Wolff, J. C., Thompson, E., Thomas, S. A., Nesi, J., Bettis, A. H., Ransford, B., Scopelliti, K., Frazier, E. A., & Liu, R. T. (2019). Emotion dysregulation and non-suicidal self-injury: A systematic review and meta-analysis. *European Psychiatry: The Journal of the Association of European Psychiatrists*, 59, 25–36. <https://doi.org/10.1016/j.eurpsy.2019.03.004>
- You, J., Deng, B., Lin, M.-P., & Leung, F. (2016). The interactive effects of impulsivity and negative emotions on adolescent nonsuicidal self-injury: A latent growth curve analysis. *Suicide & Life-Threatening Behavior*, 46(3), 266–283. <https://doi.org/10.1111/sltb.12192>