Cognitive processes associated with emotional disorders: implications for efficient psychological treatments

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Abstract

Background: Emotional disorders are the most prevalent worldwide. Despite psychotherapies are their treatment of choice, there are difficulties to apply them property in mental health services. Since literature shows that cognitive processes are associated with anxiety and depressive symptoms, more information is needed in order to improve psychological treatments.

Aims: To determine the relation between cognitive factors with specific and non-specific emotional disorder symptoms in order to promote the development of accurate psychological treatments.

Methods: We analyzed the relation between rumination, worry, and metacognition with generalized anxiety, panic, and depression disorder symptoms from a clinical sample of 116 individuals through correlation and linear regression analyses.

Results: Although each specific disorder had a closer link with a particular cognitive process, all general emotional disorder symptoms were associated with the three cognitive factors studied.

Conclusions: For "pure" disorders, targeting a concrete cognitive process might be an optimal therapeutic option. However, due to the high comorbidity among emotional disorders, we support the dissemination of the transdiagnostic treatment approach in which all cognitive factors are taken into account.

Keywords: emotional disorders; anxiety; depression; cognitive processes; psychological treatments; transdiagnostic

1. Introduction

Emotional disorders (EDs) such as generalized anxiety, panic disorder, and depression are the most prevalent mental disorders worldwide (WHO, 2017). They have been increasing since the last decade (Chisholm et al., 2016), and with the recent COVID-19 pandemic their prevalence is even higher (Huang & Zhao, 2020). Thereby, mental health care is a highly demanded service that faces the challenging task of offering efficient treatments to an exponential number of individuals (Fisher & Dickinson, 2014; Kudyba, 2018; McHugh & Barlow, 2010). Scientific research recommends psychological therapies as the treatment of choice for EDs (NICE, 2011; Watts et al., 2015). In spite of the importance of applying evidence-based interventions (Gálvez-Lara et al., 2018, 2019; Moriana et al., 2017), it is complicated to do so in real therapeutic contexts (Bird et al.,

2014; Kovess-Masféty et al., 2007; Moreno & Moriana, 2016). This might be explained by the complexity to deliver manualized extensive psychotherapies (Rashidian et al., 2008; Sheldon et al., 2004) and the difficulty to provide specific-disorder interventions when the comorbidity among EDs is the rule rather than the exception (González-Robles et al., 2018; Kessler et al., 2005; Wu & Fang, 2014).

In light of the above, the interest in studying a transdiagnostic conceptualization and treatment of EDs have been growing (Barlow et al., 2004; Barlow et al., 2017; Newby et al., 2015; Sakiris & Berle, 2019). This transdiagnostic approach aims to address the EDs underlying characteristics (Barlow et al., 2004; Hofmann & Barlow, 2014; McManus et al., 2011). In this sense, research has pointed a causal relationship between cognitive processing biases and the vulnerability to both anxiety and depressive symptoms (Alloy & Rissind, 2006; Mathews & MacLeod, 2005). In fact, it has been claimed that high pre-treatment levels of dysfunctional cognitive processes predict an inferior treatment response (Ciesla & Roberts, 2002; Jones et al., 2008). Literature shows that some maladaptive mental strategies are common to a whole variety of psychiatric disorders. For instance, pathological worry has been pointed as a key cognitive factor in the development and maintenance of anxiety disorders like generalized anxiety or social anxiety and mood disorders like mayor depression (Chelminski & Zimmerman, 2003; McEvoy et al., 2013; Starcevic et al., 2007). Besides, high levels of worry are associated with neurotic personality traits and poorer management of emotions (McLaughlin et al., 2007; Muris et al., 2005). Similarly, rumination has been linked to different mental disorders like depression, generalized anxiety and post-traumatic stress disorder (McEvoy et al., 2013; McLaughlin & Nolen-Hoeksema, 2011; Hu et al., 2014). Moreover, studies emphasize on the risk of anxiety and depressive symptoms when high levels of this mental process are present (Ehring & Watkins, 2008; Spinhoven et al., 2018; Yapan et al., 2020). However, it appears that rumination is not only related to internalizing disorders, but also to externalizing ones like aggressive behavior (McLaughlin et al., 2014). Lastly, the meta-analytic review of Sun et al. (2017) shows how dysfunctional metacognitive beliefs are a common process across psychopathology. In this sense, metacognition has been identified as a cognitive factor in personality, psychotic and eating disorders (Seow & Gillan, 2020; Gumley, 2011; Vann et al., 2014). It has also detected in the large spectrum of EDs, including generalized anxiety,

obsessive-compulsive disorder, depression and panic disorder (Leahy et al., 2019; McEvoy et al., 2013; Wells, 2008).

It has been argued that modifying these cognitive processes through a transdiagnostic psychological treatment could help to reduce the severity of the different EDs symptoms at the same time (Akbari & Khanipour, 2018; Aldao et al., 2010; Salguero et al., 2019). Nevertheless, it is needed more information about the mental processing behind EDs and how to implement efficient psychological therapies in practical contexts (Dalgleish et al., 2020). For that reason, the aims of this work are to elucidate how cognitive processes (worry, rumination, and metacognition) influence in the presence of specific and non-specific EDs symptoms, with the objective to guide clinicians and researchers to develop more accurate psychological treatments.

2. Methods

2.1. Participants

The sample was composed of participants aged 18-65 with generalized anxiety disorder, panic disorder and/or mayor depression disorder. They were initially evaluated anonymously by a clinical independent researcher using DSM-5 (APA, 2013) criteria according to SCDI-I interview in order to fulfill the inclusion criteria of presenting at least one of the mentioned EDs. Afterwards, participants were assessed with different self-reported measures. Participants with personality disorders, addiction disorders or intellectual disability were excluded. Besides, individuals who were receiving any type of treatment (psychological or pharmacological) for their EDs symptoms were also excluded.

2.2. Measures

Clinic*al variables*

Depression. *Beck Depression Inventory-Second Edition (BDI-II)* (Beck et al., 1996). It measures the severity of the different symptoms of depression. Scores can be located between 0 and 63 points. This inventory has excellent internal consistency (α = 0.94) (Arnau et al., 2001).

Generalized anxiety. *Generalized Anxiery Disorder Scale (GAD-7)* (Spitzer et al., 2006). It measures anxiety symptoms and their frequency is rated. Scores could vary between 0-21 points. The scale has good internal consistency (α = .89 to .93) (García-

Campayo et al., 2010; Zhong et al., 2015). It has been validated to be used in Spanish primary care with a high sessitivity (Muñoz-Navarro et al., 2017).

Panic. *Patient Health Questionnaire-Panic Disorder (PHQ-PD*) (Spitzer et al., 1999). It asseses the somatic and cognitive symptoms related to panic disorder which are responded affirmativively or negatively. Scores can be located from 0 to 15 points. It has been validated to be used in Spanish primary care with a high sensitivity (Muñoz-Navarro et al., 2016).

Mixed EDs symptoms. *Brief Symptom Inventory 18 (BSI-18)* (Derogatis, 2000). It evaluates the severity EDs symptoms (including anxiety, somatizations and depressive ones) and scores vary from 0 to 72. The instrument has good internal consistency ($\alpha = .93$) (Franke et al., 2017). Since the BSI-18 is not a specific-disorder scale, we used it to evaluate EDs symptoms from a transdiagnotic approach.

Cognitive processes variables

The following instruments have been recently validated to be used in primary care settings for individuals with EDs (Muñoz-Navarro et al., 2020).

Worry. *Penn State Worry Questionnaire-Abbreviated (PSWQ-A)* (Meyer et al., 1990; Sandín et al., 2009). It assesses the tendency to experience worry. It has eight items that are responded according to a 5-point Likert-type scale. Higher scores indicate higher levels of tendency to worry. It has excellent internal consistency ($\alpha = .90$) (Muñoz-Navarro et al., 2020).

Rumination. *Ruminative Response Scale-Brooding (RRS-B)* (Hervás, 2008; Nolen-Hoeksema, 1991). The RRS is the most used measure of rumination. The short version that evaluates "brooding rumination", which is defined as passive and judgmental thoughts about one's mood (Treynor et al., 2003), consists of 5 items that are responded on a 4-point Likert-type scale. Higher scores mean higher tendency to ruminate. It presents good internal consistency ($\alpha = .79$) (Muñoz-Navarro et al., 2020).

Metacognition. *Metacognition Questionnaire-Negative Beliefs (MCQ-NB)* (Ramos-Cejudo et al., 2013; Wells & Cartwright-Hatton, 2004). This instrument has been used to assess metacognitive beliefs about uncontrollability and danger. It consists of 5 items that are responded on a 4-point Likert-type scale. Higher scores indicate higher tendency to interpret the own thoughts as dangerous. The instrument has a good internal consistency ($\alpha = .82$) (Muñoz-Navarro et al., 2020).

2.3. Procedure

Participants were recruited from January 2020 to March 2020 when they consulted for the first time in primary care centers of Cordoba (Spain) with EDs symptoms. From the 147 participants that were invited, 125 (85.03%) were willing to participate in the study, and 116 (78.92%) were considered clinically affected after the first assessment. The study was carried out in accordance with the Declaration of Helsinki and the Spanish Data Protection Law. All the included participant provided written informed consent. The study was authorized by the Ethics and Clinical Research Committee of the Ministry of Health of the Andalusian Government (Spain) (code: PSI2014-56368-R).

2.4. Statistical analyses

Firstly, the presence of outliers was checked by a box plot and some subjects were eliminated. Subsequently, descriptive statistics were performed using the SPSS v.25 (IBM) program. Normal distribution assumptions were confirmed with Kolmogorov-Smirnov. In order to explore the association of the sociodemographic variables, the different diagnoses, and the cognitive factors with the EDs symptoms, Student´s *t*, ANOVAs and Pearson´s correlation coefficient tests were calculated. Multiple linear regression analyses were performed including worry, rumination, and metacognition as explanatory variables of the different clinical symptoms of each specific and non-specific disorder. Regression coefficients with 95% interval confidence were calculated and standardized regression coefficients were also provided. Lastly, determination coefficients for each model were also analyzed. Following Cohen (1988), an R^2 around 0.02 indicates a small effect, an R^2 value around 0.15 indicates a medium effect, and an R^2 around 0.35 or larger indicates a high effect.

3. Results

From the 116 participants were finally recruited, the typical profile was a married woman with secondary studies. The majority of the participants (75.8%) presented more than one ED. Therefore, the comorbidity among the EDs was high in the sample. Details of the sample can be found on Table 1.

Any of the sociodemographic variables showed a significant correlation with any of the different EDs symtoms. Regarding the diagnoses, positive significant correlations were found between them and some EDs symptoms. Mayor depressive disorder

correlated with BDI-II, panic disorder with PHQ-PD, and generalized anxiety disorder with GAD-7 and PHQ-PD. From a transdiagnostic approach, we found that all the disorders correlated with BSI-18. When exploring the link between the cognitive factors and EDs symptoms, outcomes showed that all mental processing variables had a possitive significant correlation with the severity of every specific symptom´s disorder measure. For depression symptoms, rumination showed a large effect and worry and metacognition showed a medium effect. For panic disorder symptoms, metacognition pointed a large effect, while rumination and worry pointed a medium effect. Lastly, for generalized anxiety symptoms, worry presented a large effect, whereas rumination and metacognition presented a medium effect. For its part, we found that all cognitive factors (rumination, worry and metacognition) had a significant possitive bidirectional impact on global non-specific EDs symptoms with a moderate effect (see Table 2).

Finally, regression analyses showed that each cognitive factor acted as a single explanatory variable for each specific disorder symptoms. In this sense, rumination was the only variable contributing to an explanatory model of depressive symptoms, worry was the only one contributing to the developtment of generalized anxiety disorder symptoms, and metacognition was the only one contributing to the development of panic disorder symptoms. However, when the transdiagnostic symptom approach was taken into account, all three cognitive factors acted as signigicant contributors of the explanatory model. Every regression model performed showed a large determination coefficient (see Table 3).

Table 1. Characteristic of the sample (*N* = 116)

Sociodemographic factors	
Age, *M (SD)*	39.40 (11.67)
Gender: *n (%)*	
Male	25 (21.6)
Female	91 (78.4)
Civil status: *n (%)*	
Single	31 (26.7)
Married/Cohabiting	65 (56)
Divorced/Separated	17 (14.7)
Widowed	3 (2.6)
Educational level: *n (%)*	
Basic	33 (28.4)
Medium	60 (51.7)
Superior	23 (19.8)
Employment status: *n (%)*	
Employed	48 (41.4)
Unemployed	50 (43.1)
Sick leave	18 (15.5)
Annual income: *n (%)*	
< 12000€	21 (18.1)
12000 ≤ 24000€	53 (45.7)
24000 ≤ 36000€	33 (28.4)
> 36000€	9 (7.8)
Clinical variables	
Diagnoses: *n (%)*	
MDD	93 (80.17)
GAD	89 (76.72)
PD	74 (63.79)
Comorbidity: *n (%)*	
1/3 Disorders	28 (24.14)
2/3 Disorders	36 (31.03)
MDD + GAD	18 (50)
MDD + PD	10 (27.78)
GAD + PD	8 (22.22)
3/3 Disorders	52 (44.83)
Symptomatology: *M (SD*)	
BDI-II	27.84 (10.38)
PHQ-PD	8.33 (3.85)
GAD-7	10.83 (4.58)
BSI-18	34.73 (11.10)
Cognitive processes	
RRS-B, *M (SD)*	12.00 (3.64)
PSWQ-A, *M (SD)*	21.56 (8.35)
MCQ-NB, *M (SD)*	14.21 (4.73)

Notes: BDI-II = Beck Depression Inventory-Second Edition; BSI-18 = Brief Symptom Inventory; GAD = Generalized Anxiety Disorder; GAD-7 = Generalized Anxiety Disorder Scale; MCQ-NB = Metacognition Questionnaire-Negative Beliefs; MDD = Mayor Depressive Disorder; PD = Panic Disorder; PHQ-PD = Patient Health Questionnaire-Panic Disorder; PWQS-A = Penn State Worry Questionnaire-Abbreviated; RRS-B = Ruminative Response Scale-Brooding

Table 2. Associations between the different variables and the clinical symptoms

Variables	BDI-II		PHQ-PD		GAD-7		BSI-18	
	Statistical	*p*	Statistical	*p*	Statistical	*p*	Statistical	*p*
Sociodemographic factors								
Age	ρ = -.08	.413	ρ = -.14	.130	ρ = -.17	.068	ρ = -.11	.221
Gender	t = -1.00	.318	t = 1.55	.125	t = 0.77	.441	t = 0.41	.681
Civil status	F = 1.87	.139	F = 1.17	.326	F = 1.62	.188	F = 1.24	.299
Educational level	F = 0.63	.534	F = 0.65	.524	F = 2.18	.118	F = 1.15	.319
Employment status	F = 0.41	.662	F = 0.39	.680	F = 1.34	.266	F = 0.55	.580
Annual income	F = 1.25	.295	F = 0.43	.732	F = 0.08	.971	F = 0.72	.543
Diagnoses								
MMD	F = 67.96	.000	F = 1.13	.290	F = 0.00	.999	F = 8.53	.004
GAD	F = 0.27	.605	F = 3.16	.078	F = 83.83	.000	F = 7.29	.008
PD	F = 0.74	.393	F = 202.3	.000	F = 7.17	.009	F = 7.79	.006
Cognitive processes								
RRS-B	r = .73	.000	r = .26	.005	r = .29	.002	r = .50	.000
PWQS-A	r = .30	.001	r = .31	.001	r = .77	.000	r = .45	.000
MCQ-NB	r = .27	.000	r = .72	.000	r = .33	.000	r = .41	.000

Notes: BDI-II = Beck Depression Inventory-Second Edition; BSI-18 = Brief Symptom Inventory; GAD = Generalized Anxiety Disorder; GAD-7 = Generalized Anxiety Disorder Scale; MCQ-NB = Metacognition Questionnaire-Negative Beliefs; MDD = Mayor Depressive Disorder; PD = Panic Disorder; PHQ-PD = Patient Health Questionnaire-Panic Disorder; PWQS-A = Penn State Worry Questionnaire-Abbreviated; RRS-B = Ruminative Response Scale-Brooding

Table 3. Regression analyses examining the contribution of cognitive processes in the clinical symptoms

	B	*SE B*	95% CI for *B*	*β*	*F / t*	R^2	*p*
BDI-II					42.81	.53	.000
RRS-B	1.99	0.20	1.60 – 2.39	.70	10.00		.000
PSWQ-A	0.07	0.09	-0.11 – 0.25	.06	0.77		.444
MCQ-NB	0.07	0.16	-0.24 – 0.39	.03	0.46		.385
PHQ-PD					39.76	.52	.000
RRS-B	0.03	0.08	-0.12 – 0.18	.03	0.46		.650
PSWQ-A	0.01	0.03	-0.06 – 0.18	.02	0.29		.773
MCQ-NB	0.57	0.06	0.45 – 0.69	.70	9.55		.000
GAD-7					54.45	.59	.000
RRS-B	0.04	0.08	-0.12 – 0.20	.03	0.50		.615
PSWQ-A	0.41	0.04	0.34 – 0.48	.75	11.11		.000
MCQ-NB	0.02	0.07	-0.11 – 0.15	.02	0.32		.751
BSI-18					21.77	.37	.000
RRS-B	1.06	0.25	0.57 – 1.55	.35	4.26		.000
PSWQ-A	0.33	0.11	0.12 – 0.55	.25	2.95		.004
MCQ-NB	0.49	0.49	0.10 – 0.88	.21	2.49		.014

Notes: BDI-II = Beck Depression Inventory-Second Edition; BSI-18 = Brief Symptom Inventory; GAD-7 = Generalized Anxiety Disorder Scale; MCQ-NB = Metacognition Questionnaire-Negative Beliefs; PHQ-PD = Patient Health Questionnaire-Panic Disorder; PWQS-A = Penn State Worry Questionnaire-Abbreviated; RRS-B = Ruminative Response Scale-Brooding

4. Discussion

This study provides two main findings. On the one hand, it is remarkable how, each cognitive factor presented a clear relationship with the symptoms of an specific disorder. In fact, it seems that "pure" EDs can be explained by a single cognitive process. To be concrete, excessive worry was specially related to generalize anxiety disorder symptoms, rumination with depresssion symptoms, and biased metacognitive thoughts with panic disorder ones. This is consistent with other works that have also detected a more powerful link between worry for generalized anxiety disorder (Borkovec & Inz, 1990; Makovac et al., 2016; Thayer et al., 1996), ruminative thoughts for depression (Gibb et al., 2012; Piraman et al., 2016) and negative metacognitive beliefs about uncontrollability and danger for panic disorder (Cucchi et al., 2012; Oguz et al., 2019). On the other hand, in accordance with previous literature (Barlow et al., 2004, 2017), our results suggest that EDs share several maldaptative cognitive factors, since worry, rumination and metacognition were directly related with the symptoms of all disorders and with their overall severity. This may be realated to the extensive comorbidity among

them. Indeed, all three cognitive processes contributed to explain EDs symptoms from a transdiagnostic approach.

Taking this into consideration, it would be plausible to propose to focus on a particular cognitive mechanism for the treatment of each ED. For that reasons, clinicians may opt for paying more attention to worry when facing generalized anxiety disorder, to rumination when treating depression, and to metacognition when treating panic disoder. In this sense, some studies have claimed the existing differences in the cogntive model of the different EDs, specially when comparing anxiety and depression (Clark & Steer, 1996; Hallion &Ruscio, 2011). This is why focusing on the modification of a concrete cognitive processes for the treatment of each ED could have a potential clinical value and could promote targeted therapy. Although other potential alternatives, such as metacognitive therapy for generalized anxiety and mayor depression have been postulated (Hagen et al., 2017; Papageorgiou & Wells, 2015; Wells, 2005), this clinical guideline would be useful to shorten the lengh of psychothrerapies for the treatment of EDs. Indeed, the abbreviation of traditional psychological treatments seems to be a clinical efficient possibility to treat a whole variety of anxiety and depressive disorders (Cape et al., 2010; Corpas et al., 2021; Saravanan et al., 2017; Shepardson et al., 2016) Moreover, it has been demostrated the interaction between the different mental processes on affect states and cognitive control and activity (Beckwé et al., 2014; McLauglin et al., 2007). Therefore, it might be expected that if the principal cognitive mechanisms behind one disorder is altered, other cognitive factors would also change. Consequently, other EDs symptoms would be indirectly treated as well. In fact, it has been proven that modifying worry thinking (Chen et al., 2013), rumination (McEvoy et al., 2013) or metacognition (Callesen et al., 2019; Normann et al., 2014) by themselves reduce both anxiety and depressive symptoms. Ultimately, treating the core cognitive process of an specific disorders may be an efficient tactic to respond to EDs in the clinical practice.

However, based on our high comorbity results, which are in the line of other several studies (González-Robles et al., 2018; Kessler et al., 2005; Wu & Fang, 2014), it seems undenible that “pure” EDs are very uncommon. In fact, all three diagnoses contempleted in this study were directly related with the transdiagnotic measure of EDs symptoms. With this in mind, selecting a particular cognitive mechanisms appears to be complicated in the practice. Instead, therapy models that are based on combinations of cogntive processes rather than only one of them would became the most efficient strategy.

In fact, the study of Drost et al. (2014) points that all cogntive processes are suitable targets for the transdignostic treatment of EDs. . In this sense, the recent systematic review of Cassiello-Robbins et al. (2020) encourages the adaptation of transdiagnostic treatments to real therapeutic circumstances. In this vein, some countries have already begun to incorporate these types of interventions. Notoriously, the United Kingdom started the Improving Access to Psychological Therapies (IAPT) programme 10 years ago with excellent clinical results (Clark, 2018; Wakefield et al., 2020). That experience might inspire other countries to switch from traditional therapies to a brief transdiagnostic approach for EDs. In this line, some studies have proven that time-limited and non-specific disorder treatments are effective in reducing anxiety and depressive symptoms (Corpas et al., 2021; Dear et al., 2011; Kristjánsdóttir et al., 2019). Finally, the study of Arnold et al. (2020) is the most recent example of the suitability of brief transdiagnostic psychotherapies in the COVID-19 pandemic context. That study shows the benefits of applying these psychological interventions for several EDs and warns about the need disseminate them now more than ever.

4.1. Limitations

The main limitations of the present study are related to some of the sample characteristics. For instance, the predefined age restrictions did not include children, adolescents or the elderdly. That might makes it difficult to apply our results to that specific populations. Regarding children and youth, some studies have also pointed that ruminnation is closely related to depression (Abela & Hankin, 2011; Hankin, 2009; Verstraeten et al., 2011) and that high levels of worry is a risck factor for generalized anxiety disorder in youth (Rabner et al., 2017; Verstraeten et al., 2011). Furthemore, the recent work of Schweizer et al. (2020) claims that global cognitive vulnarability transdiagnotically associates with EDs in youth, which is consistent with our results. Similarly, repetitive thinking also appears to deplete mood in older adults (Pierre & Stefan, 2017). Besides, this particular mental processes seems to be transdiagnotically related to several anxiety and depressive disorders in the elderly (Chen et al., 2020). On the contrary, the study of Diefenbach et al. (2010) pointed that similar levels of worry are present in older aldults with and witout generalized anxiety disorder. Therefore, worry might not be a key point in the ederly, since that cognitive factor could be inherent to that sector of the populaton. For its part, the 91% of women in our study migh be another limitation. However, as it is indicated in the meta-analysis of Steel et al. (2014), the

prevalence of females suffering from common mental disorders are very high. Finally, we did not contemplate other comorbidities, such as intellectual disabilities or personality disorders. Therefore, the results obtained might vary in more clinically complicated cases.

5. Conclusions

Previous research highlighted the need to study the cognitive characteristics of individuals suffering from EDs (Bower et al., 2011; Dalgleish et al., 2020). In this sense, we conclude that an optimal initial assessment might be fundamental insomuch as it would determine the type of treatment. For "pure" EDs, psychotherapies targeting a particular cognitive process might be the best option because they could be sufficient to archive recovery. However, for mixed EDs, transdiagnostic psychological treatments that contemplate several mental mechanisms would be recommended. Since the probabilities of facing the second scenario are much higher (González-Robles et al., 2018; Kessler et al., 2005; Wu & Fang, 2014), we claim that supporting the dissemination of adapted transdiagnostic treatments within mental health services would be the most efficient strategy for the treatment of EDs. In this sense, updated literature suggests that, precisely, the transdiagnostic approach should be the first therapeutic step for anxiety and depressive disorders (Arnold et al., 2020; Cassiello-Robbins et al., 2020; Choi et al., 2020). In fact, it has been pointed that these types of interventions would also benefit health systems because they would reduce wait-lists and treatment costs (Radhakrishnan et al., 2013; Ruiz-Rodríguez et al., 2018). Nevertheless, despite the demonstrated weight of cognitive factors have on EDs, more underlying mechanisms, like emotional regulation strategies, must be considered from now on.

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