**Metacognitions, rumination, and worry in Personality Disorder**

Running title: Metacognitions in Personality Disorder

Marcantonio M. Spada a,\*, Ana V. Nikčević b, Daniel, C. Kolubinski a, Alessia Offredi c, Simona Giuri c, Antonella Gemelli c, Alessandra Brugnoni c , Andrea Ferrari c and Gabriele Caselli a,c,d

a Division of Psychology, School of Applied Sciences, London South Bank University, London, UK

b Department of Psychology, School of Law, Social and Behavioural Sciences, Kingston University, London, UK

c Studi Cognitivi, Milan, Italy

d Sigmund Freud University, Milan, Italy

Authors’ email addresses:

[spadam@lsbu.ac.uk](mailto:spadam@lsbu.ac.uk)

[a.nikcevic@kingston.ac.uk](mailto:a.nikcevic@kingston.ac.uk)

[kolubid2@lsbu.ac.uk](mailto:kolubid2@lsbu.ac.uk)

[a.offredi@studicognitivi.net](mailto:a.offredi@studicognitivi.net)

[s.giuri@studicognitivi.net](mailto:s.giuri@studicognitivi.net)

[antonellagemelli1@gmail.com](mailto:antonellagemelli1@gmail.com)

[alessandra.brugnoni@gmail.com](mailto:alessandra.brugnoni@gmail.com)

[andrea.ferrari7@gmail.com](mailto:andrea.ferrari7@gmail.com)

[g.caselli@milano-sfu.it](mailto:g.caselli@milano-sfu.it)

\* Correspondence to: Professor Marcantonio M. Spada, Division of Psychology, School of Applied Sciences, London South Bank University, 103 Borough Road, London SE1 0AA, United Kingdom. Email: [spadam@lsbu.ac.uk](mailto:spadam@lsbu.ac.uk).

*Funding sources:* No financial support was received for this study.

*Authors’ contribution:* MMS, DCK, AVN and GC are responsible for the study concept and design. DCK performed the analysis. MMS, DCK, AVN and GC wrote the first draft of the manuscript. All authors critically reviewed and approved the final version of the manuscript.

*Conflict of interest:* The authors declare no conflict of interest.

*Ethical standards:* This study did not involve human and/or animal experimentation.

**Abstract**

Research on metacognitions and repetitive negative thinking in patients with Personality Disorder (PD) is scarce. We aimed to determine if metacognitions and repetitive negative thinking differed between patients with PD and those without PD, and if metacognitions would predict repetitive negative thinking in patients with PD controlling for several variables. A sample of 558 clinical participants were assessed for the presence of a PD diagnosis and completed the following questionnaires: Penn-State Worry Questionnaire, Ruminative Response Scale, Metacognitions Questionnaire 30, Beck Anxiety Inventory and Beck Depression Inventory. Compared to patients without a diagnosis of PD, patients with a PD diagnosis reported higher scores on both rumination and worry (as well as depression and anxiety) and three out of five of the MCQ-30 subscales (positive beliefs about worry, negative beliefs about thoughts concerning uncontrollability and danger, and beliefs about the need to control thoughts). Furthermore, the results of two hierarchical regression analyses in patients with a diagnosis of PD indicated that positive beliefs about worry and negative beliefs about thoughts concerning uncontrollability and danger were independent predictors of worry, and that negative beliefs about thoughts concerning uncontrollability and danger and cognitive self-consciousness were independent predictors of rumination. Metacognitions and repetitive negative thinking may play a role in the severity of psychological distress experienced in PD presentations. The implications of these findings are discussed.

Key words: Anxiety; depression; metacognitions; Personality Disorder; rumination; worry.

**Introduction**

The prevalence estimates of Personality Disorders (PDs) in the general population in the United States and Europe is in the region of 6-13% (Sansone, & Sansone, 2011). There is considerable comorbidity between PDs and a wide range of emotional disorders, particularly for those diagnosed with Borderline Personality Disorder (BPD) and Antisocial Personality Disorders (ASPD) (84.5% and 70.2% respectively met criteria for one or more 12-month Axis I Disorders (Lenzenweger et al., 2007; Goodwin et al., 2005). Importantly, it has been reported that the impairment in functioning resulting from PDs may be largely accounted for by Axis I comorbidity (Lenzenweger et al., 2007).

PDs are known to be difficult to treat and although psychological therapy is the treatment of choice (e.g., Bamelis et al., 2014), drop-out rates are high and can range from 25.6% (Swift, & Greenberg, 2012) to 40.8% (Gamache et al., 2018). These data highlight the importance of furthering our understanding of therapeutic mechanisms that need addressing in treatment in order to improve engagement and outcomes. One such mechanism that is amenable to therapeutic change and that may account for comorbidity between affective disorders and PDs is repetitive negative thinking.

**Repetitive negative thinking (rumination and worry) and its links with PDs**

Repetitive negative thinking (RNT) is defined as the “process of thinking attentively, repetitively or frequently about the self and one’s world” (Segerstrom et al., 2003, p.909). This form of maladaptive thinking plays a central role in various models of psychological maladjustment (Watkins, 2008). Two types of RNT, worry and rumination, have been found to be associated with a range of adverse outcomes such as the intensification and maintenance of negative mood, impaired concentration, memory, and problem-solving, and reduced motivation for instrumental behaviour, amongst others (for a review see Watkins, 2008). Rumination and worry appear to share the same processes but differ in terms of temporal orientation, with worry characterised by future directed thinking and rumination focused on past directed thinking (Watkins et al., 2005; Segerstrom et. al., 2000). Although worry is considered to be a primary attribute of Generalised Anxiety Disorder (APA, 2013), whereas rumination is typical of depression (Nolen-Hoeksema, 2000; Spasojevic, & Alloy, 2001), the two are considered transdiagnostic pathological processes that increase vulnerability to multiple anxiety and mood disorders. RNT accounts for comorbidity between anxiety and mood disorders; such comorbidity is associated with higher levels of RNT (McEvoy et al., 2013). Given the high comorbidity of emotional and PDs, it seems plausible that RNT may also be highly prevalent amongst individuals diagnosed with PDs. However, the extant literature on the topic is limited.

Most of the evidence linking RNT and PDs comes from studies using student populations, cross-sectional designs and focuses on features of BPDs. Titus and DeShong (2020) reported that worry and rumination were positively associated with both BPD features as well as suicide risk in university students. Other researchers (Peters et al., 2017) have reported that symptoms of BPD are positively associated with various types of dysfunctional rumination i.e., depressive brooding, anger rumination, rumination on interpersonal situations, anxious rumination, and stress-reactive rumination, after controlling for general rumination. Baer & Sauer (2011) found that depressive and anger rumination were strongly associated with the severity of borderline features over and above trait-level sadness, anger, and general negative affect.

BPD is a severe disorder characterised by difficulties with affective disturbance and regulation, interpersonal problems, and maladaptive impulsive behaviours (APA, 2013). According to the Emotional Cascade Model (Selby et al., 2009; Selby et al., 2008), rumination plays a central role in driving dysregulated behaviour in individuals with BPD. Typically, rumination will be initiated following an emotionally arousing event (e.g., an interpersonal conflict), in a misguided effort to solve problems, understand the causes and meanings and to reduce distress. However, these efforts will backfire and lead to the intensification of distress which in turn will lead to engagement in impulsive behaviour (self-harm or substance abuse) in order to escape or obtain relief from distress (Peters et al., 2017). In line with this model Selby and colleagues (2009) have established that a composite rumination variable that includes depressive brooding, anger rumination and catastrophising fully mediated relationship between BPD symptoms and dysregulated behaviour such as self-harm and binge eating.

Apart from the limited literature concerning the role of rumination in BPD, we have not been able to identify any other studies where the role of RNT was examined in the context of other PDs. It is plausible to hypothesise that rumination plays a role in other PDs, such as in antisocial PD or narcissistic PD, as it may exacerbate distress which in turn will lead to antisocial behaviour (in those with antisocial PD) or acts of rejection or harm in those with narcissistic PD. Thus, rumination may mediate the relationship between distress and PD symptoms. This remains to be established empirically.

**The metacognitive model of psychopathology**

Since the early 1990s metacognition has been introduced as a basis for understanding and treating psychological distress (Wells, & Matthews, 1994; 1996). In the metacognitive model of psychopathology (the Self-Regulatory Executive Function model; S-REF model), Wells and Matthews argue that psychological distress is maintained by maladaptive coping strategies (e.g., rumination and worry, threat monitoring, avoidance, and thought suppression) that cause negative thoughts and emotions to become perseverative (Wells, 2000). The activation and persistence of these maladaptive coping strategies is linked to metacognitions (sometimes termed ‘metacognitive beliefs’).

Metacognitions can be broadly separated into positive metacognitions, which are beliefs about the impact of coping strategies on cognition (e.g., “Ruminating will help me make sense of my thoughts”) and negative metacognitions, which are beliefs about the uncontrollability and dangers relating to thinking (e.g., “I cannot control my mind”). Metacognitions and typically assessed using the Metacognitions Questionnaire-30 (MCQ-30; Wells, & Cartwright- Hatton, 2004). The MCQ-30 assesses the following metacognitions: positive beliefs about worry (reflecting beliefs that RNT is useful); negative beliefs about thoughts concerning uncontrollability and danger (reflecting beliefs that thinking may be uncontrollable and harmful); cognitive confidence (reflecting beliefs in one's own attention and memory); beliefs about the need to control thoughts (reflecting beliefs about the importance of controlling cognition); and cognitive self-consciousness (reflecting beliefs about the tendency to self-focus attention and monitor thoughts). A very substantial literature base has focused, over the last 20 years, on the role of metacognitions across the spectrum of psychiatric disorders (Casale, Musicò, & Spada, 2021; Hamonniere, & Varescon, 2018; Palmieri et al., 2021; Spada et al., 2013;; ‏Wells, 2013) and, in addition, the structure of the S-REF model has been showcased empirically in anxiety disorders (Wells, & Carter, 2001), Obsessive Compulsive Disorder (Myers, & Wells, 2005), Unipolar Depression (Papageorgiou, & Wells, 2003), and addictive behaviours (Spada et al., 2015; Caselli et al., 2018). No research, to date, however, has investigated the role of metacognitions in PDs.

**Aims of the current study**

In the light of current scientific evidence, the first aim of the current study was to determine if metacognitions and RNT differed between patients diagnosed with PD and those without a diagnosis of PD. First, we hypothesised that both metacognitions and RNT would be higher in patients with a diagnosis of PD when compared to patients with emotional disorders but without a diagnosis of PD. Furthermore, we hypothesised that RNT will be positively associated with the severity of PD features, that is the number of PD criteria met. Secondly, we wanted to establish if metacognitions would predict levels of RNT in patients diagnosed with PD controlling for gender, number of PD criteria met, anxiety, and depression. If so, this would indicate the value of targeting both metacognitions and RNT in patients diagnosed with PD.

**Method**

**Participants**

Participants were a consecutive series of 558 patients (270 females; mean age = 37.08 years [SD = 11.40; range 18 to 72 years]) seeking outpatient psychological treatment in two private clinical centres in Modena (Studi Cognitivi and Psicologica). After the clinician administered assessment of PDs (details provided below), 372 (175 females) out of 558 patients, did not meet criteria for PD and 186 (95 females) met criteria for at least one PD (166 patients presenting with one PD diagnosis, 16 presenting with two PD diagnoses, three presenting with three PD diagnoses, and one presenting with four PD diagnoses). A full list of the diagnoses made by type of PD can be found in Table 1. Comorbidities with Axis I disorder are presented in Table 2. Study inclusion criteria were: (1) 18 years of age or above; (2) understanding of spoken and written Italian; (3) informed consent to participate in the study; and (4) completion of the clinician-administered Structured Clinical Interview for DSM-IV Axis II (SCID-II) – from September 2013 to January 2017 - or Structured Clinical Interview for DSM-5 Personality Disorder (SCID-5-PD) – from February 2017 to December 2019.

**Self-report measures**

**Worry.** The Penn-State Worry Questionnaire (PSWQ; Meyer et al., 1990) is a widely-used self-report measure of the intensity and uncontrollability of worry. The PSQW comprises of 16 items which are rated using a 5-point Likert scale (1 = “Not typical at all of me” and 5 = “Very typical of me”). Items include “As soon as I finish one task, I start to worry about everything else I have to do”. Higher scores indicated higher levels of worry. The PSWQ has demonstrated good reliability and validity across clinical and community samples (Brown, Antony, & Barlow, 1992; van Rijsoort, Emmelkamp, & Vervaeke, 1999).

**Rumination.** The Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) is a widely used self-report measure of the tendency to ruminate in response to depressed mood. The RRS comprises of 22 items which are rated using a 4-point Likert scale (1 = “Almost never” and 4 = “Almost always”). Items include: “Think about how alone you feel” and “Think about how angry you are with yourself”. Higher scores indicate higher levels of rumination. The RRS has demonstrated good reliability and validity across clinical and community samples (Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

**Metacognitions.** The Metacognitions Questionnaire 30 (MCQ-30; Wells, & Cartwright-Hatton, 2004) is widely used self-report measure of generic metacognitions in psychopathology. The MCQ-30 comprises of 30 items which are rated using a 4-point Likert scale (1 = “Do not agree” and 4 = “Agree very much”). Five factors are assessed, which include: (a) positive beliefs about worry; (b) negative beliefs about thoughts concerning and uncontrollability and danger; (c) cognitive confidence; (d) beliefs about the need to control thoughts; and (e) cognitive self-consciousness. Higher scores indicate higher levels of dysfunctional generic metacognitions. The MCQ-30 has demonstrated good reliability and validity across clinical and community samples (Spada, Mohiyeddini, & Wells, 2008; Wells & Cartwright-Hatton, 2004).

**Anxiety.** The Beck Anxiety Inventory (BAI; Beck, & Steer, 1993) is a widely used 21-item self-report measure assessing the main components of anxiety, such as “Numbness or tingling”, “Feeling hot” and “Dizzy or lightheaded”. Items are rated on a 4-point Likert scale (0 = “Not at all” and 3 = “Severe”). Higher scores indicate higher levels of anxiety.

**Depression.** The Beck Depression Inventory (BDI; beck et al., 1961) is a widely used 21-item self-report measure assessing symptoms of depression, which are rated on a on a 4-point Likert scale (e.g. “I do not feel sad” to “I am so sad or unhappy that I can't stand it”. Higher scores indicate higher levels of depression.

**Procedure**

Participants were outpatients who voluntarily sought psychological treatment at the Studi Cognitivi and Psicologica Clinics in Modena, Italy, between September 2013 and December 2019. Ethics approval for the study was granted by the Ethics Committee of Studi Cognitivi. After obtaining informed consent, all participants were enrolled in the study, which included providing demographic details, completing self-report measures, and the diagnostic interview SCID-II or SCID-5-PD (the clinical interview changed due to the DSM-5 publication in 2015). Diagnostic interviews were conducted by five trained psychotherapists with the supervision of two senior clinicians who are both psychiatrists. Self-report measures were completed by participants in a small office on the clinical premises. Following this, SCID-II or SCID-5-PD were administered, with a duration between 40 minutes and 2 hours. Inclusion and exclusion criteria were also verified during the interviews.

**Data analysis**

Group differences were calculated across all self-report measures between those who had qualified for a diagnosis of a PD and those who did not. To conduct a non-parametric MANOVA, a series of independent Mann-Whitney U tests were performed, which included a Bonferroni adjustment to reduce the chance of a type-I error. Correlation analyses using Spearman’s Rho were conducted in order to test the associations between the variables of interest. A hierarchical regression analysis was also conducted with worry and rumination as outcome variables. All analyses were conducted using SPSS (version 25; IBM Corp, 2017).

**Results**

**Distribution of data and group differences between patients with a diagnosis of PD and patients without a diagnosis of PD**

A series of Shapiro-Wilk normality tests indicated that all variables in the study were non-normally distributed at the *p* < .001 level. A Chi-Square test determined that there were no gender differences between the groups (X2(1) = .298, n.s.). However, a Mann-Whitney U Test demonstrated that there was a significant difference in age between the groups (35.7 [11.4] for the group with a diagnosis of PD and 37.9 [11.4] for the group without a diagnosis of PD).

After applying a Bonferroni adjustment, a series of Independent Samples Mann-Whitney U Tests indicated that statistically significant differences did exist between groups for worry (U = 47,227.5, Z = 7.039, *p* < .01); rumination (U = 48,380, Z = 7.684, *p* < .01); depression (U = 48,754, Z = 7.891, *p* < .01); and anxiety (U = 42,122.5, Z = 4.195, *p* < .01). There were also significant differences for three of the MCQ-30 subscales: positive beliefs about worry (U = 40,821.5, Z = 3.481, *p* < .01); negative beliefs about thoughts concerning uncontrollability and danger (U = 45,234, Z = 5.941, *p* < .01); and beliefs about the need to control thoughts (U = 44,930, Z = 5.774, *p* < .01). Mean differences on two subscales of the MCQ-30, however, were not statistically significant (cognitive confidence and cognitive self-consciousness). See Table 3 for group means.

**Predictors of rumination and worry in patients with a diagnosis of PD**

Table 4 shows the means, standard deviations, and correlations between the variables included in this study. All correlations were conducted using Spearman’s Rho, with a particular focus on the variables correlating with worry and rumination. Worry and rumination had a moderate correlation with each other (rs = .46, *p* < .001). Worry was moderately correlated with anxiety (rs = .38, *p* < .001) and depression (rs = .36, *p* < .001) and two subscales of the MCQ-30: negative beliefs about thoughts concerning uncontrollability and danger (rs = .49, *p* < .001) and beliefs about the need to control thoughts (rs = .33, *p* < .001). There was a weak correlation between worry and gender (rs = .16, *p* < .05), the number of PD criteria (rs = .19, *p* < .05) and two MCQ-30 subscales: positive beliefs about worry (rs = .17, *p* < .05) and cognitive self-consciousness (rs = .19, *p* < .01).

There were strong correlations between rumination and depression (rs = .69, *p* < .001) and negative beliefs about thoughts concerning uncontrollability and danger (rs = .51, *p* < .001). Rumination was moderately correlated with anxiety (rs = .44, *p* < .001), and beliefs about the need to control thoughts (rs = .44, *p* < .001). Lastly, there were weak correlations between rumination and cognitive confidence (rs = .23, *p* < .001), cognitive self-consciousness (rs = .25, *p* < .001) and the number of PD criteria (rs = .16, p < .001).

A four-step hierarchical regression analysis was conducted with the worry as the outcome variable (See Table 5). Gender was entered as the predictor variable on the first step. Anxiety and depression were entered on the second step, followed by the number of PD criteria on the third step. Lastly, four subscales of the MCQ-30 were entered on the fourth step. Each of the first two steps resulted in a significant increase in variance, resulting in a model that accounted for 18.6% of the variance of worry scores. When controlling for levels of depression and anxiety, however, gender and the number of PD criteria were not significant predictors of worry (B = 2.105, n.s.; B = .349, n.s). The addition of the four MCQ-30 subscales that correlated with worry on the fourth step did produce a significant increase in the level of variance (R2 change = .167, *p* < .001). However, only positive beliefs about worry and negative beliefs about thoughts concerning uncontrollability and danger were predictors of worry when controlling for the other variables (B = .414, *p* < .05 [LL = .084, UL = .743]; B = 1.270, *p* < .001 [LL = .803, UL = 1.737]). None of the other variables retained their significance.

A three-step hierarchical regression was conducted with rumination as the outcome variable (See Table 6). Anxiety and depression were entered on the first step, which accounted for 46.8% of the variance of rumination scores. However, only depression scores were significant predictors of rumination (B = .793, *p* < .001 [LL = .634, UL = .952]). This was followed by the number of PD criteria on the second step, which did not result in a significant change to the variance (R2 change = .003, n.s.). The four MCQ-30 subscales that correlated with rumination were placed on the third step, which did produce a significant increase in the variance explained (R2 change = .07, *p* < .001). Depression retained its significance as a predictor of rumination (B = .698, *p* < .001 [LL = .533, UL = .862]), as did both negative beliefs about thoughts concerning uncontrollability and danger, and cognitive self-consciousness (B = .712, *p* < .01 [LL = .267, UL = 1.158]; B = .484, *p* < .01 [LL = .117, UL = .852]).

**Discussion**

To our knowledge, this is the first study to investigate metacognitions and RNT in a sample of patients with the PD diagnoses. Results showed that, compared to patients without a diagnosis of PD, participants with a diagnosis of PD reported higher scores on both rumination and worry (as well as depression and anxiety). RNT was also positively associated with the number of PD criteria met by the patients. These results are in line with the findings from previous studies confirming that presenting with features of BPD, and the severity of BPD, are associated with higher scores on rumination and worry (e.g., Baer, & Sauer, 2011; Peters et al., 2017; Titus, & DeShong, 2020). However, previous studies have predominantly utilised university student samples and focused exclusively on BPD features. The novelty of our findings thus lies in showcasing the differences in levels of RNT in patients with a diagnosis of PD, taken as a whole, relative to patients with other emotional disorders and without a diagnosis of PD.

Our findings also highlight the importance of metacognitions in differentiating patients with a diagnosis of PD from those without a diagnosis of PD. We found that patients with a diagnosis of PD reported higher scores on three out of five of the MCQ-30 subscales (positive beliefs about worry, negative beliefs about thoughts concerning uncontrollability and danger, and beliefs about the need to control thoughts). Furthermore, the results of two hierarchical regression analyses in the patients with a diagnosis of PD indicated that controlling for gender, number of PD criteria, anxiety, and depression: (1) positive beliefs about worry and negative beliefs about thoughts concerning uncontrollability and danger were independent predictors of worry; and (2) negative beliefs about thoughts concerning uncontrollability and danger and cognitive self-consciousness were independent predictors of rumination.

These findings are consistent with the S-REF model psychopathology (Wells, & Matthews, 1994; 1996) which postulates that metacognitions are associated with the activation and maintenance of maladaptive coping strategies (e.g., rumination and worry) that bring to an escalation of psychological distress. We know from the extant literature that holding positive beliefs about the benefits of worry is linked to the activation of RNT and that the combination of negative beliefs about thoughts concerning uncontrollability and danger and beliefs about the need to control thoughts leads to cycles of greater accessibility of threat concepts in processing and an escalation of negative affect across psychological disorders (e.g., Wells, 2000; Spada et al., 2015). For example, several researchers investigating the link between rumination, metacognitions, and depression (Papageorgiou, & Wells, 2003; Faissner et al., 2018) have described the importance of both these metacognitions in the pathogenesis of unipolar depression, highlighting its connection to the activation and maintenance of rumination. Since depressive symptoms are a part of the clinical picture in PD (APA, 2013), rumination, negative beliefs about thoughts concerning uncontrollability and danger and beliefs about the need to control thoughts could emerge as a clinical expression of negative affect in this condition.

Taken together, our findings show, for the first time, that patients with a diagnosis of PD report higher levels of metacognitions and RNT compared to patients with emotional disorders but without a diagnosis of PD. If this finding were to be replicated, it could open-up new prospects in the psychotherapeutic treatment of patients with a diagnosis of PD through targeting metacognitions and RNT. This could be achieved by through Metacognitive Therapy (MCT; Wells, 2009). MCT has already been developed and applied to, with significant success, the treatment of a wide range of psychological disorders (see Wells, 2013 and Normann, & Morina, 2018 for a review). MCT techniques, such as the restructuring of metacognitions, the postponement of RNT, attention training and detached mindfulness may be of benefit when targeting the rumination-depression and worry-anxiety axes in PD.

Results of this study must be considered with regards to its limitations. Firstly, a cross-sectional design was adopted, and this precludes the drawing of conclusions as to whether or not metacognitions play a causal role in predicting RNT in PD. Secondly, social desirability, self-report biases, context effects, and poor recall may have contributed to errors in self-report measurements. Thirdly, though results showed that, compared to patients without a diagnosis of PD, participants with a diagnosis of PD reported higher scores on both rumination and worry (as well as depression and anxiety) it is possible that this difference may be due to the comorbidity of PD with anxiety disorders and depression, which has not been considered in this study. Fourthly, our findings were limited to data collected from two clinics in the same city, which may limit generalisation. These limitations also suggest some directions for future research. For example, an ideal demonstration of any causal contribution of metacognitions to RNT in PD could involve an experimental or clinical manipulation of metacognitions, rumination and worry, or the employment of a longitudinal research design.

**Conclusions**

Our findings show, for the first time, that patients with a diagnosis of PD report higher levels of both metacognitions and RNT compared to patients with emotional disorders but without a diagnosis of PD, and that metacognitions predict both rumination and worry in patients with a diagnosis of PD beyond negative affect and PD criteria. If this finding were to be replicated, it could open-up new prospects in the psychotherapeutic treatment of PD patients including the potential use of MCT.

**References**

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5).* American Psychiatric Pub.

Baer, R. A., & Sauer, S. E. (2011). Relationships between depressive rumination, anger rumination, and Borderline Personality features. *Personality Disorders: Theory, Research, and Treatment, 2*, 142-150.

Bamelis, L. L., Evers S. M., Spinhoven P., & Arntz A. (2014). Results of a multicenter randomized controlled trial of the clinical effectiveness of schema therapy for personality disorders. *Ametican Journal of Psychiatry*, *171*, 305–322.

Beck, A. T., & Steer, R. A. (1993). *Beck Anxiety Inventory - Manual.* San Antonio, TX: The Psychological Corporation.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*(6), 561-571.

Brown, T. A., Antony, M. M., & Barlow, D. H. (1992). Psychometric properties of the Penn State Worry Questionnaire in a clinical anxiety disorders sample. *Behaviour Research and Therapy*, *30*(1), 33-37.

Casale, S., Musicò, A., & Spada, M. M. (2021). A systematic review of metacognitions in

Internet Gaming Disorder and problematic Internet, smartphone, and social networking sites use. *Clinical Psychology & Psychotherapy.* In press.

Caselli, G., Martino, F., Spada, M. M., & Wells, A. (2018). Metacognitive therapy for alcohol use disorder: A systematic case series. *Frontiers in Psychology*, *9*, 2619.‏

Faissner, M., Kriston, L., Moritz, S., & Jelinek, L. (2018). Course and stability of cognitive and metacognitive beliefs in depression. *Depression & Anxiety, 35*(12), 1239-1246.

Gamache, D., Savard, C., Lemelin, S., Cote, A., & Villeneuve, E. (2018). Premature psychotherapy termination in an out- patient treatment program for personality disorders: a survival analysis. *Comprehensive Psychiatry*, *80*, 14-23.

Goodwin, R. D., Brook, J. S., & Cohen, P. (2005). Panic attacks and the risk of personality disorder. *Psychological Medicine*, *35*, 227-235.

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.

Hamonniere, T., & Varescon, I. (2018). Metacognitive beliefs in addictive behaviours: A systematic review. *Addictive Behaviors*, *85*, 51-63.‏

IBM Corp. (2017). *IBM SPSS Statistics for Windows, Version 25*. Armonk, NY: IBM Corp.

Lenzenweger, M. F., Lane, M. C., Armand W. L., & Kessler, R. C. (2007). DSM-IV personality disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, *62*(6), 553-564.

McEvoy, P. M., Watson, H., Watkins, E. R., & Nathana, P. (2013). The relationship between worry, rumination, and comorbidity: evidence for repetitive negative thinking as a transdiagnostic construct. *Journal of Affective Disorders, 151,* 313-320.

Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, *28*(6), 487-495.

Myers, S. G., & Wells, A. (2005). Obsessive-compulsive symptoms: The contribution of metacognitions and responsibility. *Journal of Anxiety Disorders, 19*, 806-817.

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109*, 504-511.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology*, *61*, 115-121.

Normann, N., & Nexhedin, M. (2018). The efficacy of Metacognitive Therapy: A systematic

review and meta-analysis. *Frontiers of Psychology, 9*, 2211.

Palmieri, S., Mansueto, G., Ruggiero, G. M., Caselli, G., Sassaroli, S., & Spada, M. M. (2021).

Metacognitive beliefs across eating disorders and eating behaviors: A systematic review. *Clinical Psychology & Psychotherapy*. Published electronically 19th of February 2021.

Papageorgiou, C., & Wells, A. (2003). An empirical test of a clinical metacognitive model of rumination and depression. *Cognitive Therapy and Research*, *27,* 261-273 .

Peters, J. R., Eisenlohr-Moul, T. A., Upton, B.T., Talavera, N. A., Folsom, J. J., & Baer, R. A. (2017). Characteristics of repetitive thought associated with Borderline Personality features: A Multimodal investigation of ruminative content and Style. *Journal of Psychopathology and Behavioral Assessment. 39,* 456-466.

Sansone, R. A., & Sansone, L. A. (2011). Personality disorders: a nation-based perspective on prevalence. *Innovations in Clinical Neuroscience*, *8*(4), 13-18.

Segerstrom, S. C., Stanton, A. L., Alden, L. E., & Shortridge, B. E. (2003). A multidimensional structure for repetitive thought: What’s on your mind, and how, and how much? *Journal of Personality and Social Psychology, 85*, 909-921

Segerstrom, S. C., Tsao, J. C. I., Alden, L. E., & Craske, M. G. (2000). Worry and rumination: Repetitive thought as a concomitant and predictor of negative mood. Cognitive *Therapy and Research, 24,* 671-688.

Selby, E.A., Anestis, M. D., Bender, T. W., & Joiner, T.E. (2009). Exploration of the Emotional Cascade Model in Borderline Personality Disorder. *Journal of Abnormal Psychology, 118,* 375-387.

Selby, E. A, Anestis, M. D., & Joiner, T. E. (2008). Understanding the relationship between emotional and behavioral dysregulation: Emotional cascades. *Behaviour Research and Therapy, 46,* 593-611.

Spada, M. M., Caselli, G., Nikčević, A. V., & Wells, A. (2015). Metacognition in addictive behaviors. *Addictive Behaviors*, *44*, 9-15.‏

Spada, M. M., Mohiyeddini, C., & Wells, A. (2008). Measuring metacognitions associated with emotional distress: Factor structure and predictive validity of the Metacognitions Questionnaire 30. *Personality and Individual Differences*, *45*, 238-242.

Spada, M. M., Proctor, D., Caselli, G., & Strodl, E. (2013). Metacognition in substance misuse. In P. Miller (Ed.), Principles of Addiction: Comprehensive Addictive Behaviors and Disorders, Volume 1. Oxford, UK: Elsevier.

Spasojevic, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion, 1*, 25-37.

Swift J. K., & Greenberg, R. P (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *Journal of Consultant Clinical Psychology*, *80*, 547-559.

Titus, C. E., & DeShong, H. L. (2020). Thought control strategies as predictors of borderline personality disorder and suicide risk. *Journal of Affective Disorders*, 266, 349-355.

Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, *27*(3), 247-259.

van Rijsoort, S. Van, Emmelkamp, P., & Vervaeke, G. (1999). The Penn State Worry Questionnaire and the Worry Domains Questionnaire: Structure, reliability and validity. *Clinical Psychology & Psychotherapy*, *6*, 297-307.

Watkins, R. E. (2008). Constructive and unconstructive repetitive thoughts. *Psychological Bulletin, 134,* 263-206.

Wells, A. (2000). *Emotional Disorders and Metacognition: Innovative Cognitive Therapy*.

Chichester, UK: Wiley.

Wells, A. (2013). Advances in Metacognitive Therapy. *International Journal of Cognitive Therapy, 6*, 186-201.

Wells, A., & Carter, K. (2001). Further tests of a cognitive model of generalized anxiety

disorder: metacognitions and worry in GAD, panic disorder, social phobia, depression, and non patients. *Behavior Therapy, 32*, 85-102.

Wells, A., & Cartwright-Hatton, S. (2004). A short form of the metacognitions questionnaire: Properties of the MCQ-30. *Behaviour Research and Therapy*, *42*(4), 385-396.

Wells, A., & Matthews, G. (1994). *Attention and Emotion. A Clinical Perspective*. Hove, UK: Erlbaum.

Wells, A., & Matthews, G. (1996). Modelling cognition in emotional disorder: the S-REF model. *Behaviour Research and Therapy, 34,* 881-888.

Table 1: Diagnoses by type of Personality Disorder.

|  |  |  |
| --- | --- | --- |
|  | Number | Percentage |
| Antisocial | 6 | 3.2 |
| Avoidant | 43 | 22.8 |
| Borderline | 50 | 26.4 |
| Dependent | 10 | 5.3 |
| Histrionic | 5 | 2.7 |
| Narcissistic | 10 | 5.3 |
| Obsessive-Compulsive | 34 | 17.9 |
| Paranoid | 26 | 13.8 |
| Schizoid | 2 | 1.1 |

Table 2: Comorbidities with Axis I disorder (% on total sample, nr = 558)

|  |  |  |  |
| --- | --- | --- | --- |
|  | With PD | Without PD | Total |
| MDD (%) | 68 (8.8) | 49 (12.2) | 117 (21.0) |
| DYS (%) | 8 (1.4) | 7 (1.3) | 15 (2.7) |
| PaD (%) | 22 (3.9) | 29 (5.2) | 51 (9.1) |
| GAD (%) | 64 (11.5) | 53 (9.5) | 117 (21.0) |
| SAD (%) | 20 (3.6) | 16 (2.9) | 36 (6.5) |
| SP (%) | 5 (0.9) | 3 (0.5) | 8 (1.4) |
| HYP (%) | 2 (0.4) | 4 (0.7) | 6 (1.1) |
| PTSD (%) | 6 (1.1) | 1 (0.2) | 7 (1.3) |
| OCD (%) | 18 (3.2) | 24 (4.3) | 42 (7.5) |

Note: PD = Personality Disorder MDD = Major Depressive Disorder; DYS = Dystimia; PaD = Panic Disorder; GAD = Generalized anxiety disorder; SAD = Social Phobia; SP = Specific Phobia; HYP= Hypocondriasis; PTSD = Post Traumatic Stress Disorder; OCD = Obsessive Compulsive Disorder.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Table 3: Means and standard deviations for patients with a Personality Disorder diagnosis versus those without a Personality Disorder diagnosis.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Patients with a PD diagnosis | |  | Patients without a PD diagnosis | |  |
|  | Mean | S.D. | n | Mean | S.D. | n |
| 1. Age\* | 35.66 | 11.37 | 182 | 37.87 | 11.36 | 340 |
| 1. PSWQ\* | 60.18 | 11.15 | 186 | 52.29 | 12.26 | 372 |
| 1. RRS\* | 57.41 | 12.51 | 186 | 48.53 | 12.38 | 372 |
| 1. BAI\* | 19.02 | 12.66 | 186 | 14.36 | 11.02 | 372 |
| 1. BDI\* | 19.73 | 9.79 | 186 | 12.92 | 8.89 | 372 |
| 1. MCQ-30 (POS)\* | 12.04 | 4.22 | 186 | 10.70 | 3.83 | 372 |
| 1. MCQ-30 (NEG)\* | 16.97 | 3.88 | 186 | 14.78 | 3.87 | 372 |
| 1. MCQ-30 (CC) | 12.67 | 5.39 | 186 | 11.45 | 5.08 | 372 |
| 1. MCQ-30 (NC)\* | 13.52 | 3.96 | 186 | 11.50 | 3.81 | 372 |
| 1. MCQ-30 (CSC) | 15.87 | 3.97 | 186 | 15.11 | 3.79 | 372 |

*n* 182 to 372

Note: PD = Personality Disorder; PSWQ = Penn State Worry Questionnaire; RRS = Rumination Responses Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; MCQ-30 (POS) = Metacognitions Questionnaire-30 – Positive Beliefs about Worry; MCQ-30 (NEG) = Metacognitions Questionnaire-30 – Negative Beliefs about Thoughts Concerning Uncontrollability and Danger; MCQ-30 (CC) = Metacognitions Questionnaire-30 – Cognitive Confidence; MCQ-30 (NC) = Metacognitions Questionnaire-30 – Beliefs about the Need to Control Thoughts; MCQ-30 (CSC) = Metacognitions Questionnaire-30 – Cognitive Self-Consciousness; \**p* < .01.

Table 4: Correlations for the sample of patients diagnosed with a Personality Disorder.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1. Gender |  |  |  |  |  |  |  |  |  |  |  |
| 1. Age | .00 |  |  |  |  |  |  |  |  |  |  |
| 1. PSWQ | .16\* | -.05 |  |  |  |  |  |  |  |  |  |
| 1. RSS | .14 | -.14 | .46\*\* |  |  |  |  |  |  |  |  |
| 1. BAI | .19\* | -.20\* | .38\*\* | .44\*\* |  |  |  |  |  |  |  |
| 1. BDI | .19\* | -.10 | .36\*\* | .69\*\* | .56\*\* |  |  |  |  |  |  |
| 1. MCQ-30 (POS) | -.10 | -.03 | .17\* | .10 | -.05 | .06 |  |  |  |  |  |
| 1. MCQ-30 (NEG) | .12 | -.12 | .49\*\* | .51\*\* | .51\*\* | .45\*\* | .12 |  |  |  |  |
| 1. MCQ-30 (CC) | .10 | .15\* | .13 | .23\*\* | .19\* | .26\*\* | .04 | .28\*\* |  |  |  |
| 1. MCQ-30 (NC) | .00 | -.19\* | .33\*\* | .44\*\* | .29\*\* | .41 | .17\* | .62\*\* | .22\*\* |  |  |
| 1. MCQ-30 (CSC) | .09 | -.23\*\* | .19\*\* | .25\*\* | .17\* | .11 | .12 | .31\*\* | .07 | .46\*\* |  |
| 1. Number of PD criteria | .05 | .15\* | .19\* | .16\* | .14 | .17\* | -.13 | .19\* | .22\*\* | .16\* | .04 |

*n* 182 to 186; \**p* < .05; \*\**p* < .01.

Note: PSWQ = Penn State Worry Questionnaire; RRS = Rumination Responses Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; MCQ-30 (POS) = Metacognitions Questionnaire-30 – Positive Beliefs about Worry; MCQ-30 (NEG) = Metacognitions Questionnaire-30 – Negative Beliefs about Thoughts Concerning Uncontrollability and Danger; MCQ-30 (CC) = Metacognitions Questionnaire-30 – Cognitive Confidence; MCQ-30 (NC) = Metacognitions Questionnaire-30 – Beliefs about the Need to Control Thoughts; MCQ-30 (CSC) = Metacognitions Questionnaire-30 – Cognitive Self-Consciousness. Number of PD criteria = total of PD criteria fully satisfied following the structured clinical interview.

Table 5: Four-step hierarchical regression analysis with worry (PSWQ) as the outcome variable (patients diagnosed with a Personality Disorder).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | | **Coefficientsa** | | | | | | | |
| Model | | | R2 | Change in R2 | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|  |  | | B | Std. Error | β | Lower Bound | Upper Bound |
| 1 | (Constant) | | .032 | .032\* | | 58.143 | 1.153 |  | 50.433 | .000 | 55.868 | 60.417 |
|  | Gender | |  |  | | 3.994 | 1.613 | .180 | 2.476 | .014 | .811 | 7.177 |
|  |  | |  |  | |  |  |  |  |  |  |  |
| 2 | (Constant) | | .186 | .154\*\* | | 49.840 | 1.780 |  | 27.995 | .000 | 46.328 | 53.353 |
| Gender | |  |  | | 2.106 | 1.522 | .095 | 1.384 | .168 | -.897 | 5.108 |
| BAI | |  |  | | .156 | .069 | .177 | 2.255 | .025 | .019 | .292 |
| BDI | |  |  | | .319 | .090 | .281 | 3.567 | .000 | .143 | .496 |
| 3 | (Constant) | | .200 | .013 | | 46.520 | 2.605 |  | 17.859 | .000 | 41.381 | 51.660 |
| Gender | |  |  | | 2.105 | 1.513 | .095 | 1.391 | .166 | -.881 | 5.091 |
| BAI | |  |  | | .154 | .069 | .175 | 2.244 | .026 | .019 | .290 |
| BDI | |  |  | | .288 | .091 | .253 | 3.166 | .002 | .108 | .467 |
| Number of PD Criteria | |  |  | | .349 | .201 | .119 | 1.738 | .084 | -.047 | .745 |
| 4 | (Constant) | | .366 | .167\*\* | | 26.028 | 4.158 |  | 6.260 | .000 | 17.822 | 34.233 |
| Gender | |  |  | | 2.244 | 1.400 | .101 | 1.603 | .111 | -.518 | 5.007 |
| BAI | |  |  | | .040 | .066 | .046 | .607 | .544 | -.090 | .171 |
| BDI | |  |  | | .159 | .088 | .139 | 1.797 | .074 | -.016 | .333 |
| Number of PD Criteria | |  |  | | .313 | .184 | .107 | 1.702 | .090 | -.050 | .677 |
| MCQ-30 (POS) | |  |  | | .414 | .167 | .157 | 2.480 | .014 | .084 | .743 |
| MCQ-30 (NEG) | |  |  | | 1.270 | .237 | .442 | 5.362 | .000 | .803 | 1.737 |
| MCQ-30 (NC) | |  |  | | -.219 | .245 | -.078 | -.893 | .373 | -.702 | .265 |
| MCQ-30 (CSC) | |  |  | | .124 | .196 | .044 | .630 | .529 | -.263 | .511 |
|  | |  | | |  | | | | | | | |

Note: PSWQ = Penn State Worry Questionnaire; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; MCQ-30 (POS) = Metacognitions Questionnaire-30 – Positive Beliefs about Worry; MCQ-30 (NEG) = Metacognitions Questionnaire-30 – Negative Beliefs about Thoughts Concerning Uncontrollability and Danger; MCQ-30 (NC) = Metacognitions Questionnaire-30 – Beliefs about the Need to Control Thoughts; MCQ-30 (CSC) = Metacognitions Questionnaire-30 – Cognitive Self-Consciousness; *n* = 186; \**p* < .05; \*\**p* < .001.

Table 6: Three-step hierarchical regression analysis with rumination (RSS) as the outcome variable (patients diagnosed with a Personality Disorder).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | | **Coefficientsa** | | | | | | | |
| Model | | | R2 | Change in R2 | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|  |  | | B | Std. Error | β | Lower Bound | Upper Bound |
| 1 | (Constant) | | .468 | .468\*\* | | 39.699 | 1.559 |  | 25.471 | .000 | 36.624 | 42.774 |
| BAI | |  |  | | .109 | .062 | .110 | 1.751 | .082 | -.014 | .232 |
| BDI | |  |  | | .793 | .080 | .621 | 9.854 | .000 | .634 | .952 |
| 2 | (Constant) | | .472 | .003 | | 37.839 | 2.333 |  | 16.217 | .000 | 33.235 | 42.442 |
| BAI | |  |  | | .108 | .062 | .109 | 1.738 | .084 | -.015 | .231 |
| BDI | |  |  | | .775 | .082 | .607 | 9.440 | .000 | .613 | .937 |
| Number of PD Criteria | |  |  | | .195 | .183 | .059 | 1.071 | .286 | -.165 | .556 |
| 3 | (Constant) | | .524 | .070\*\* | | 22.152 | 3.762 |  | 5.888 | .000 | 14.727 | 29.577 |
| BAI | |  |  | | .012 | .062 | .012 | .188 | .851 | -.111 | .135 |
| BDI | |  |  | | .698 | .083 | .546 | 8.365 | .000 | .533 | .862 |
| Number of PD Criteria | |  |  | | .090 | .175 | .027 | .511 | .610 | -.256 | .435 |
| MCQ-30 (NEG) | |  |  | | .712 | .226 | .221 | 3.157 | .002 | .267 | 1.158 |
| MCQ-30 (CC) | |  |  | | .073 | .129 | .032 | .568 | .570 | -.181 | .328 |
| MCQ-30 (NC) | |  |  | | -.034 | .230 | -.011 | -.148 | .883 | -.487 | .419 |
| MCQ-30 (CSC) | |  |  | | .484 | .186 | .154 | 2.599 | .010 | .117 | .852 |
|  | |  | | |  | | | | | | | |

Note: RRS = Rumination Responses Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; MCQ-30 (NEG) = Metacognitions Questionnaire-30 – Negative Beliefs about Thoughts Concerning Uncontrollability and Danger; MCQ-30 (CC) = Metacognitions Questionnaire-30 – Cognitive Confidence; MCQ-30 (NC) = Metacognitions Questionnaire-30 – Beliefs about the Need to Control Thoughts; MCQ-30 (CSC) = Metacognitions Questionnaire-30 – Cognitive Self-Consciousness; *n* = 186; \**p* < .05; \*\**p* < .001.