Mediterranean Journal of Clinical Psychology

ISSN 2282-1619

MJCP

Volume 11, n 3, 2023

Clinical Psychology

Interference of difficulties in mindful acceptance and emotional intelligence, added to perseverative negative thinking, in emotional balance: A study with a low/high emotional symptomatology clinical sample

*Teresa Magalhães [1, 2], Ricardo João Teixeira [3, 4 *], Paulo Vitória [5, 6], Célia Nunes [7], Ana Meireles [1, 8], Mariana Vaz Marques [9, 10, 11], Frederica Carvalho [10, 11], Tânia Brandão [12]*

Abstract

Background: Mental health conditions, that exhibit high prevalence within the Portuguese population, can impact individuals' functioning and adversely affect their performance across various aspects of life. Thus, it is crucial to enhance our comprehension of the psychological processes that contribute to the onset or persistence of mental health problems. Recent studies have indicated that mindfulness, emotional intelligence, and perseverative negative thinking could potentially influence emotional symptomatology. However, their relationships and the extent of their association with psychopathology symptoms remain unclear. This study aimed to examine the relationship between mindfulness, perseverative negative thinking, emotional intelligence, sociodemographic factors, and the symptoms reported by patients attending a Portuguese mental health clinic. We expect that lower levels of mindfulness and emotional intelligence along with the presence of perseverative negative thinking would contribute to explain the emotional symptomatology experienced by these patients.

Participants and procedure: The clinical sample included 390 individuals (M age = 34.33; SD = 9.99; 66.4% women) receiving cognitive-behavioral therapy at a Portuguese mental health clinic. They completed a self-report questionnaire with scales assessing mindfulness (Philadelphia Mindfulness Scale), perseverative negative thinking (Perseverative Thinking Questionnaire), emotional intelligence (Wong and Law Emotional Intelligence Scale), and emotional symptomatology (Brief Symptom Inventory).

Results: The results of the logistic regression model revealed two important findings. Firstly, a negative association between mindfulness (specifically acceptance) and emotional intelligence (particularly the use of emotions and emotion regulation) with emotional symptoms among the patients. Secondly, higher levels of perseverative negative thinking (specifically interference and unproductivity) were linked to a greater manifestation of emotional symptoms.

Conclusions: The incorporation of mindfulness, emotional regulation and management of perseverative negative thinking might be considered as contributes to improve results on clinical interventions for patients dealing with emotional symptomatology.

[1] University of Beira Interior, Health Sciences Faculty, Covilhã, Portugal

[2] UCSP Anadia III, ACeS Baixo Vouga, ARS Centro, Portugal

[3] REACH - Mental Health Clinic, Porto, Portugal

[4] University of Coimbra, CINEICC, Center for Research in Neuropsychology and Cognitive Behavioral Intervention, Coimbra, Portugal

[5] University of Beira Interior, Social and Human Sciences Faculty, Psychology and Education Department, Covilhã, Portugal

[6] CIS - Centre for Psychological Research and Social Intervention, ISCTE - Instituto Universitário de Lisboa, Lisboa, Portugal

[7] Department of Mathematics and Center of Mathematics and Applications, University of Beira Interior, Covilhã, Portugal

[8] USF Caminhos do Cértoma, ACeS Baixo Mondego, ARS Centro, Portugal

[9] Coimbra Hospital and Universitary Centre, Coimbra, Portugal
[10] University of Coimbra, Institute of Psychological Medicine, Coimbra, Portugal
[11] Psintonia, Gabinete de Psicologia, Coimbra, Portugal
[12] William James Center for Research, Ispa – Instituto Universitário, Lisboa, Portugal
E-mail corresponding author: ricardo@reach.com.pt

Keywords:
Mindfulness; Emotional intelligence; Perseverative negative thinking; Emotional symptomatology; Mental health; Clinical psychology.

Received: 28 June 2023
Accepted: 6 December 2023
Published: 28 December 2023

Citation: Magalhães, T., Teixeira, R.J., Vitória, P., Nunes, C., Meireles, A., Vaz Marques, M., Carvalho, F., Brandão, T. (2023). Interference of difficulties in mindful acceptance and emotional intelligence, added to perseverative negative thinking, in emotional balance: A study with a low/high emotional symptomatology clinical sample. *Mediterranean Journal of Clinical Psychology 11*(3). https://doi.org/10.13129/2282-1619/mjcp-3862

1. Introduction

Mental health problems remain a leading cause of disability worldwide. A previous meta-analysis found that one in five persons experience a mental health problem (Steel et al., 2014). Additionally, the COVID-19 pandemic may result in an additional rise in the burden of mental health problems throughout the population (Pierce et al., 2020). Depression and anxiety rank among the most prevalent mental health problems, with estimated rates of approximately 4.4% and 3.6%, respectively (World Health Organization, 2017). These difficulties elevate the likelihood of developing other health conditions and increase the risk of suicide (e.g., Clarke & Currie, 2009; Moitra et al., 2021).

In Portugal, in 2010, mental health difficulties already represented 11.75% of disability-adjusted life years (DALYs), compared to 13.74% for cerebrovascular diseases and 10.38% for oncological diseases (Carvalho et al., 2016). The increase of life expectancy and the rapid changes in lifestyles, and in social contexts relevant to the lives of individuals, are factors that influence the incidence of mental health difficulties, and related incapacities (Direção-Geral da Saúde, 2017). Portugal has one of the highest prevalence rates of mental health problems in Europe (Direção-Geral da Saúde, 2017). In the World Mental Health Survey Initiative (Xavier et al., 2013), Portugal had the fourth highest position among 34 countries that entered in the study, with an annual prevalence of 22.9% for common mental health problems (anxiety and depression), in comparison to 9.2% in Spain and 8.2% in Italy, being only surpassed by Northern Ireland with a rate of 23.1% (Carvalho, 2018). Depression, anxiety, and dementia

represent the mental health problems that most contribute to the increase of patients with these problems in primary health care units in the last 10 years (Direção-Geral da Saúde, 2017). At a global scale, depression is a prominent factor contributing to the prevalent health challenges in developed countries (Direção-Geral da Saúde, 2017). Studies show that, with the increase of age, depression is less common and less severe (Fiske et al., 2009; Gallo et al., 1994). Moreover, women seem to have a higher risk for the development of emotional problems and, at the same time, present a higher prevalence of depression and anxiety, when compared to men (Apóstolo et al., 2008; Kuehner et al., 2017). Some psychosocial variables explain the mental health difficulties experienced by individuals. For instance, several studies have shown that lack of perceived control is a risk factor for depression and emotional distress in different contexts (Dracup et al., 2003; Myles et al., 2020; 2021). Mental health problems affect the individuals´ functioning and may harm their performance in several aspects (e.g., personally, socially, and even professionally) (e.g., Ruthig et al., 2008). The origin of these difficulties is multifactorial, being determined by genetic factors, brain functioning changes, personality factors, relational and social factors. Gaining a better understanding of the psychological processes that promote the maintenance (or onset) of mental health problems, especially those that have direct implications for treatment, is of high importance.

Cognitive Behavioral Therapy (CBT) stands out as one of the most widely embraced approaches for understanding and addressing mental health challenges (e.g., Johnstone & Dallos, 2013). Thoughts, emotions, behaviors, and physical sensations are, thus, key aspects related to mental health difficulties (Merlo et al., 2022). In this this study, we will examine the association between mindfulness, emotional intelligence, and perseverative negative thinking with symptoms of psychopathology in a clinical sample, psychological aspects that can contribute to influence thoughts, emotions, behaviors, and physical sensations and, consequently, individuals' mental and physical health.

1.1 Mindfulness

Mindfulness is conceptualized has a state of full attention to the present moment, of experiencing, accepting without judging, and it can be developed by certain practices and activities (e.g., meditation; Davis & Hayes, 2011). With origins in Buddhist traditions, mindfulness is constituted by two components: acceptance and awareness. While awareness implies the attention to the present moment and to the experiences of the internal and external world, acceptance refers to an attitude of compassion and nonjudgement about the experiences of an individual.

In mental health, mindfulness is associated with lesser prevalence of psychopathology, improvements in well-being and better behavioral and emotion regulation. For instance, in a

validation study with two larger samples of undergraduate students, it was found that mindfulness presented a high capacity to predict psychological symptoms (Baer et al., 2006). Also, in a study conducted with a larger sample of adolescents (N = 1660), mindfulness was linked to lower levels of depression and anxiety (Barcaccia et al., 2020). In another cross-sectional study conducted with 1628 adults, mindfulness was positively linked to positive well-being and negatively linked to negative well-being (Crego et al., 2020). In one study with 205 high-school students, dispositional mindfulness was positively associated with academic performance (Heshmati & Pellerone, 2018).

Some reviews have shown that mindfulness contributes to reduce psychological symptoms (Davis & Hayes, 2011; Keng et al., 2011). In a recent systematic review, lower levels of dispositional mindfulness were associated not only with more psychopathological symptoms but also with less adaptive cognitive processes (e.g., rumination, pain catastrophizing) and poor emotional processing and emotion regulation (Tomlinson et al., 2018). These results suggested that mindfulness is likely to influence psychological health. Also, the link between mindfulness and mental health was supported by a recent systematic review focused on the ecological momentary assessment of these processes (Enkema et al., 2020). According to a meta-analysis, the most useful facets of mindfulness to reduce emotional symptomatology are non-judge (effect size = -0.48) and act with awareness (effect size = -0.47), followed by non-react (effect size = -0.33) and describe (effect size = -0.29) (Carpenter et al., 2019). Furthermore, a recent meta-analysis demonstrated the effectiveness of mindfulness-based programs in enhancing mental health among adults. These programs have been shown to reduce anxiety, depression, and stress, while simultaneously increasing overall well-being (Galante et al., 2021).

1.2 Emotional intelligence

Emotional intelligence (EI) is seen as set of skills for information processing. It involves individuals' capacity to recognize and express their own and others' emotions, to understand them and their meanings, to use them to facilitate thinking and to regulate them (Mayer et al., 2016). Therefore, there are four dimensions that sustain EI, making it a multidimensional construct: 1) assessment and expression of the individual´s own emotions - based on the ability to recognize and understand one´s own emotions and express them in an appropriate way; 2) assessment and recognition of other´s emotions - concerns the capacity to identify emotions in other people; it allows a greater sensitivity to other´s emotions; 3) regulation of own´s emotions - it involves the capacity of self-regulation, enables emotional control and allows the fast transition from emotional negative states to states of positive valency; 4) use of emotions to improve performance - based on the ability to use emotions to facilitate own´s performance.

EI has been linked to improvements in well-being and less perceived stress. For example, in a longitudinal study a positive association was found between EI and wellbeing components – self-esteem, life satisfaction, and self-acceptance (Carmeli et al., 2009). In the context of work, EI has been linked to lower levels of perceived stress (Cîrstoveanu et al., 2020). Also, in a comparative study between a clinical group (i.e., patients diagnosed with major depressive disorder, substance abuse disorder, or borderline personality disorder) and a non-clinical group, it was found that participants in the clinical group showed impairments in EI (Hertel et al., 2009). Also, Schutte et al. (2002) reported the results of three studies that found significant associations between EI, self-esteem, and positive mood. Furthermore, EI has been linked to greater positive affect, life satisfaction, and lower negative affect (Schutte & Malouff, 2011) as well as with less anxiety, depression, and stress in adult population (Tolsa & Malas, 2022). In cross-sectional studies with university students, EI has been linked to higher well-being and lower depression, anxiety, stress, and burnout (e.g., Loi & Pryce., 2022; MacCann et al., 2022). Also, in clinical contexts, EI deficits have been linked to eating problems and alexithymia in adults (Biolcati et al., 2021).

Various meta-analyses concluded that EI is associated with mental health (effect size = .36/.29), psychosomatic health (effect size = .33/.31) and physical health (effect size = .27/.22) (Martins et al., 2010; Schutte et al., 2007, respectively). Also, in adolescents, a recent meta-analysis provided evidence about the positive association between EI and affective and cognitive well-being (effect size = 0.35/0.27, respectively) (Llamas-Díaz et al., 2022).

1.3 Perseverative negative thinking

Perseverative negative thinking (PNT) is considered a transdiagnostic factor for several mental health problems, despite differences in thoughts content for diverse condition (Ehring & Watkins, 2008). PNT is defined as a type of thought about individual problems (past, present, and future) or about negative experiences (past or anticipated) that lays in three central characteristics from the process of thinking: the thought(s) are repetitive, intrusive, and hard to break. Two additional characteristics are associated with the dysfunctional effect perceived by individuals: it is unproductive, and it captures the mental capacity of one´s person (Ehring et al., 2011; Azevedo et al., 2017).

Several emotional problems are related to higher levels of PNT, in the form of worry and/or rumination. (Nolen-Hoeksema, 2000; Nolen-Hoeksema et al., 2007; Segerstrom et al., 2000). For instance, in a longitudinal study with 496 female adolescents, Nolen-Hoeksema et al. (2007) found that rumination is associated with future increases in bulimic and substance abuse symptoms, and with the onset of major depression, binge eating, and substance abuse, suggesting that this cognitive vulnerability is a risk factor for mental health. Also, in a

longitudinal study, repetitive though was associated with both anxiety and depression (Segerstrom et al., 2000).

In a recent investigation that compared three samples (individuals diagnosed with depression, with generalized anxiety and healthy controls), the authors found that the clinical samples exhibited differences from healthy sample in PNT, with moderate to large effect sizes; no significant differences were observed between the two clinical conditions (Wahl et al., 2019). Similarly, Zagaria et al. (2023) found that PNT is strongly associated with specific domains of psychopathology, including depression and anxiety.

In a systematic review that examined the role of PNT in the context of long-term conditions, significant associations were found with depression, anxiety, and emotional distress (with correlations ranging from 0.23 to 0.73) (Trick et al., 2016).

1.4 The present study

While recent research has found that mindfulness and EI are protective factors and PNT is a risk factor associated with the development and maintenance of psychopathology (e.g., Azevedo et al., 2017; Schutte & Malouff, 2011; Teixeira et al., 2019; Tomlinson et al., 2018), few studies have addressed their inter-relationships and relative strengths of association, especially within clinical samples. Thus, the main goal of this study was to explore the connections among mindfulness, EI, PNT and emotional symptomatology in patients of a mental health clinic.

Our hypotheses were:

(H1) we expected that the group of patients with high emotional symptomatology would report lower levels of mindfulness (e.g., Baer et al., 2006; Barcaccia et al., 2020) and emotional intelligence (e.g., Carmeli et al., 2009; Schutte et al., 2002; Schutte & Malouff, 2011) and higher levels of PNT (e.g., Nolen-Hoeksema et al., 2007; Segerstrom et al., 2000);

(H2) we expected that mindfulness, emotional intelligence and PNT would contribute to explain high emotional symptomatology within these individuals.

2. Method

2.1 Study design

This study adopts an analytical and observational approach, utilizing a cross-sectional design to examine and analyze the various factors under investigation. The cross-sectional nature of the study allows for the simultaneous collection of data at a single point in time. The analytical focus enables a detailed examination of these relationships, contributing to better understanding of the complex dynamics involved.

2.2 Participants

The sample size was estimated using a calculation for designing clinical research, considering two independent groups (Hulley et al., 2013). Based on an effect size of 0.6, to ensure statistical power of 80% and a significance level of 0.05, the recruitment of 118 participants is needed. With 75% designated for the 'With high emotional symptomatology' group, 88 participants are required for this group and 30 for the 'With reduced emotional symptomatology' group. A total of 390 patients answered to a sociodemographic and clinical questionnaire, underscoring the enhanced robustness, and increased analytical power resulting from this expanded sample size in comparison to the required 118 participants.

The inclusion criteria comprised individuals who were patients attending a Mental Health Clinic, actively seeking support through psychotherapy, psychiatry, or a combination of both, and who provided their consent to participate. The exclusion criteria encompassed individuals with severe cognitive impairment, substance abuse issues, or inability to communicate effectively.

A total of 390 patients answered a sociodemographic and clinical questionnaire. The sample presented a mean age of 34.33 (SD = 9.99; range = 13-66 years old), and the majority were women (66.4%). Moreover, the majority lived alone (55.1%; single/widow/divorced), were employed (63.9%) and had higher education (degree, master´s degree or PhD; 59%).

Table 1. Sociodemographic variables

Variable		***n***	***%***
Gender	Male	131	33.6
	Female	259	66.4
Marital status	Married/together	175	44.9
	Single	191	49.0
	Divorced/separated/widowed	24	6.1
Education	Under 9th grade	39	10
	High school	121	31
	College degree	173	44.4
	Master's/PhD	57	14.6
Professional status	Unemployed	64	16.4
	Employed	249	63.9
	Student	71	18.3
	Retired	6	1.5
Age	**Mean ± SD**	**Minimum**	**Maximum**
	34.33 ± .99	13	66

2.3 Measures

Philadelphia Mindfulness Scale (PHLMS; Cardaciotto et al., 2008; Portuguese version: Teixeira et al., 2017). The self-report scale utilized in this study consists of 20 items and includes two subscales: acceptance, which refers to an attitude of openness and receptivity towards whatever arises in one's awareness, and present moment awareness, which pertains to the regulation of attention to focus on immediate experiences, facilitating greater recognition of mental events in the present moment (Bishop et al., 2004, p. 232). Each subscale comprises 10 items that participants rate on a Likert-type scale ranging from 1 (never) to 5 (very often). The Portuguese validation confirmed the two-factor structure of the scale, and provided evidence regarding construct validity, with mindfulness being negatively linked to self-differentiation and alexithymia, as well as for their internal reliability (Cronbach's $\alpha = 0.77$ for awareness and 0.85 for acceptance) (Teixeira et al., 2017). The internal consistency of the scale in the present study was assessed using Cronbach's α coefficients, resulting in a value of 0.78 for awareness and 0.81 for acceptance.

Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002; Portuguese version: Rodrigues et al., 2011). The self-report scale utilized in this study comprises 16 items and aims to assess emotional intelligence. It encompasses four dimensions: self-emotion appraisal, others' emotion appraisal, use of emotion, and regulation of emotion. Participants rate the items on a Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The Portuguese validation confirmed the four-factor structure of the scale and provided evidence of its reliability (Cronbach's α ranging from 0.73 to 0.89) (Rodrigues et al., 2011). In the current study, the internal consistency of the scale was evaluated using Cronbach's α coefficients, resulting in values of 0.79 for self-emotion appraisal, 0.81 for others' emotion appraisal, 0.84 for use of emotion, and 0.89 for regulation of emotion.

Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011; Portuguese version: Chaves et al., 2013). The self-report scale employed in this study consists of 15 items designed to assess repetitive negative thinking. It encompasses three dimensions: the core characteristics of repetitive negative thinking, which include repetitiveness, intrusiveness, and difficulty of disengagement (each dimension comprising 3 items); the perceived unproductiveness of negative repetitive thinking (3 items); and the extent to which repetitive negative thinking captures mental resources (3 items). Participants rate the items on a Likert-type scale, ranging from 0 (never) to 4 (almost always). The Portuguese validation found a two-factor structure – repetitive thought and cognitive interference and unproductiveness, with good reliability (Cronbach's α for the total score = 0.93) and stability (test-retest = 0.79) (Chaves et al., 2013).

In this study, we used the total score of the scale. The internal consistency of the scale was evaluated using Cronbach's α coefficient, which yielded a value of 0.95.

Brief Symptom Inventory (BSI; Derogatis & Fitzpatrick, 2004; Portuguese version: Canavarro, 2007). The self-report scale utilized in this study consists of 53 items and aims to evaluate both psychopathological and psychological symptoms. It encompasses nine dimensions, namely somatization, obsessive-compulsive symptoms, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Participants rate the items on a Likert-type scale, ranging from 0 (not at all) to 4 (extremely). In this study, the internal consistency of the scale was assessed using Cronbach's α coefficients, which ranged from 0.73 (for psychoticism) to 0.89 (for depression). It is important to note that individuals with emotional difficulties are expected to score higher across various categories and indices of the Brief Symptom Inventory (BSI). Specifically, the Positive Symptom Distress Index (PSDI) is considered the most effective in distinguishing between the two groups. The cut-off point for the Portuguese population is set at ≥ 1.7, indicating that scores below this value are more likely to be indicative of individuals without emotional difficulties, while scores above it suggests the presence of emotional difficulties. Therefore, for the purpose of this study, the cut-off points of ≥ 1.7 was employed to differentiate between individuals with low versus high emotional symptomatology.

2.4 Procedure

In adherence to the ethical principles outlined in the Helsinki Declaration, this study places a paramount emphasis on the protection of participants' rights and well-being. Prior to their involvement, participants were provided with comprehensive information about the study's objectives, procedures, potential risks, and benefits. A written informed consent was obtained from all participants, ensuring that individuals fully comprehend the nature of their participation. This study was approved by the Ethics Committee of the Clinic and the first author associated University (University of Beira Interior, Health Sciences Faculty, Covilhã, Portugal; Approval number: 2; 5 February 2020). Data was collected in a Mental Health private clinic from the North of Portugal. Patients attending the clinic were approached by the staff of the clinic. The 390 patients voluntarily answered the instruments, after being ensured about the confidentiality of the data and that their participation was voluntary. Participants did not receive any type of incentives.

2.5 Data analysis

The IBM SPSS Statistics (version 25) was used to conduct the statistical analyses. Since the sample was composed by 390 patients, assuming a degree of confidence of 95%, the associated

estimation error is less than 5%. A descriptive analysis was conducted (absolute and relative frequency for qualitative variables and mean and standard deviation, minimum and maximum values for quantitative variables). To explore relationships among study variables inferential statistical methods were conducted. Due to the non-normality of the data, the Mann–Whitney U test was applied to confirm the existence of significant differences between the two groups (with and without high emotional symptomatology). To verify if there was a relation between emotional symptomatology (BSI) and the quantitative variables, the Chi-square test or Fisher's exact test (when more than 20% of the cells of contingence tables present an expect frequency inferior to 5) were applied. To quantify the level of association between the variables, Cramer's V coefficient was considered. Its interpretation was based on the following criteria (Cohen, 2013): $V<0.1$, very weak association; $0.1 \leq V < 0.3$, weak association; $0.3 \leq V < 0.5$, moderate association; $V \geq 0.5$, strong association. A binary logistic regression analysis was conducted, considering emotional symptomatology as the dependent variable, measured with the BSI (dichotomized results: high and low emotional symptomatology) and considering as independent variables those that presented a significant relation in the bivariate analysis. Therefore, the variables included in the model were: acceptance (PHLMS); assessment of own´s emotions, use of emotions and emotions regulation (WLEIS); repetitive thinking (PTQ), interference and unproductivity, and sex. The results were reported by odds ratio (OR) estimates and their 95% confidence intervals (CI). The model's goodness of fit was assessed through the Hosmer-Lemeshow test and the area under the curve (AUC) through Receiver Operating Characteristic (ROC) was used to evaluate the discriminant capacity of the model. The percentage of explained variation in emotional symptomatology was assessed using NagelKerke's R^2. The variables were selected considering the forward stepwise method (likelihood ratio). There were no multicollinearity/collinearity situations between the independent variables. A statistical significance of $p<5\%$ was applied.

3. Results

3.1 Descriptive analysis

The maximum values found for each subscale correspond, mostly, to the possible maximum value, with some participants scoring in all the subscale items with the maximum value. The minimum values correspond to the lower possible value, with also some participants classifying in all the items with the minimum value in emotional intelligence variables (except for the total score) (WLEIS), perseverative negative thinking (PTQ) and emotional symptomatology (BSI). The mindfulness variable (PHLMS) presented a minimum value higher to the minimum possible value (10 to each subscale, 20 in total). Moreover, regarding mindfulness, the awareness subscale

(37.32) had a higher mean than the acceptance subscale (24.84). Concerning emotional intelligence, the means from the subscales presented values varying from 9.54 and 16.20. Considering PNT, the means from the two subscales were very similar. The mean scores from emotional symptomatology subscales varied between 6.32 and 11.31 (it is important to remember that these subscales do not present the same number of items).

3.2 Relation between emotional symptomatology and study variables

Table 2 presents the distribution of emotional symptomatology according to sociodemographic variables. The absolute and relative frequencies of both groups are presented (low vs high emotional symptomatology) for each variable. In this sample, the general profile of people with higher emotional symptomatology is: mainly women (69.4%), single (50.9%), with a degree (45%) and working (61.1%). There was a significant relationship between emotional symptomatology and sex (weak association: $p<0.05$; $V=0.113$). There is a tendency for a relation between the presence of emotional symptomatology and age ($p<0.1$), with the group with reduced symptomatology presenting a higher age. There is also a tendency for an association between the presence of emotional symptomatology and education ($p<0.1$). The most considerable difference concerns the group under the 9th grade, with 87.2% of these having high emotional symptomatology, followed by the group with a degree, with 76.2% having high emotional symptomatology.

In summary, individuals exhibiting higher emotional symptomatology tend to be predominantly women, of a younger age, unmarried, possess a degree, and are employed.

Table 2. Emotional symptomatology according to sociodemographic variables

		BSI[a]					
		With low emotional symptomatology[b]		***With high emotional symptomatology[b]***		***p-value***	***Cramér's V***
		n	%	n	%		
Sex	Men	42	42.9 32.1	89	30.6 67.9	0.035**#[3]	0.113
	Women	56	57.1 21.7	202	69.4 78.3		
Marital status	Married/Together	51	52 29.1	124	42.6 70.9	0.263#[3]	0.083
	Single	42	42.9 22.1	148	50.9 77.9		
	Divorced/separated/widowed	5	5.1 20.8	19	6.5 79.2		
Education	Under 9th grade	5	5.1 12.8	34	11.7 87.2	0.094*#[3]	0.128
	High school	32	32.7 26.4	89	30.6 73.6		
	College degree	41	41.8	131	45.0		

			23.8		76.2		
	Master's/PhD	20	20.4	37	12.7		
			35.1		64.9		
Professional status	Unemployed	10	10.2	54	18.6	0.198[#4]	0.109
			15.6		84.4		
	Employed	70	71.4	178	61.1		
			28.2		71.8		
	Student	17	17.4	54	18.6		
			23.9		76.1		
	Retired	1	1	5	1.7		
			16.7		83.3		
			Mean ± SD		**Mean ± SD**	**p-value[#5]**	
Age			35.63 ± 9.58		33.89 ± 1.12	0.074*	

[a]Brief Symptom Inventory; [b]Cutoff point: PSDI (Positive Symptom Distress Index) ≥ 1.7; [#3]Chi-square test; [#4]Fisher's exact test; [#5]Mann-Whitney test; ***p<0.01; **p<0.05; *p<0.1.

In Table 3, we present emotional symptomatology according to mindfulness, EI and PNT [mean and standard deviation of each subscale, in each group (low vs high emotional symptomatology)].

Table 3. Emotional symptomatology as a function of dispositional mindfulness, EI and PNT

		BSI[a]		
		With low emotional symptomatology[b]	***With high emotional symptomatology[b]***	
		Mean ± SD	**Mean ± SD**	**p-value[#5]**
Dispositional Mindfulness (PHMLS)[c]	Awareness	37.23 ± 5.84	37.33 ± 6.40	0.906
	Acceptance	26.51 ± 6.26	24.25 ± 6.04	0.001***
	Total	63.74 ± 7.00	61.58 ± 7.38	0.013**
Emotional Intelligence (WLEIS)[d]	Self-emotion appraisal	15.51 ± .31	14.09 ± 3.57	<0.001***
	Others' emotion appraisal	16.32 ± 2.66	16.14 ± 3.14	0.992
	Use of emotion	14.31 ± 3.51	11.75 ± 4.22	<0.001***
	Regulation of emotion	11.39 ± 3.61	8.89 ± 3.83	<0.001***
	Total	57.52 ± 9.38	50.88 ± 9.68	<0.001***
Perservative Negative Thinking (PTQ)[e]	Repetitiveness	18.23 ± 5.78	20.95 ± 5.60	<0.001***
	Intrusiveness	17.56 ±6.89	21.21 ± 6.10	<0.001***
	Total	35.80 ± 11.83	42.16 ± 11.03	<0.001***

[a]Brief Symptom Inventory; [b]Cutoff point: PSDI (Positive Symptom Distress Index) ≥ 1.7; [c]Philadelphia Mindfulness Scale. [d]Wong and Law Emotional Intelligence Scale. [e]Perseverative Thinking Questionnaire. [#5]Mann-Whitney test; [***]p<0.01; [**]p<0.05; [*]p<0.1.

We verified that there are significant differences between the two groups (low vs high emotional symptomatology) respecting the values of the acceptance subscale and the total mindfulness scale (PHLMS), of the assessment of own´s emotions, use of emotions, emotions regulation and the total EI scale (WLEIS) and of the repetitive thinking subscale, the interference and unproductivity subscale and the total perseverative negative thinking (PTQ) ($p<0.05$). The acceptance subscale and the total mindfulness scale, the assessment of own´s emotions, use of emotions, emotions regulation and the total EI scale (WLEIS) presented significantly higher values in the group with low emotional symptomatology. Considering the three PNT subscales (PTQ), the group with low emotional symptomatology presented significant higher values.

In summary, there were significant differences, in the expected directions, between the low and the high emotional symptomatology groups in terms of mindfulness, EI, and PNT. Specifically, the high emotional symptomatology group reported lower levels of acceptance and total mindfulness, lower levels of EI (all dimensions except others' emotion appraisal), and more PNT (both subscales and total score).

Table 4 presents the results of the binary logistic regression analysis. The overall model presents a well-fitting value ($p_{Hosmer\text{-}Lemeshow}>0.05$). About 22% of the variance of emotional symptomatology is explained by the model (R^2NegelKerke=0.22) and the model presents a correct global classification of 76.9%. Moreover, the model has good discriminant capacity (AUC=75.8%).

Table 4. Logistic regression model, considering the variables inserted in the model (Stepwise)

	B	**p-value**	**Exp (B) = OR**	**CI 95%**
Constant	4.273	<0.001	71.725	
Acceptance (PHLMS[a])	-0.068	0.001	0.934	[0.896;0.974]
Use of emotion (WLEIS[b])	-0.121	0.001	0.886	[0.826;0.951]
Regulation of emotion (WLEIS[b])	-0.1	0.004	0.905	[0.846;0.968]
Intrusiveness (PTQ[c])	0.058	0.005	1.060	[1.017;1.103]

Note. p^{Hosmer}=0.950; R^2Negelkerke=0.220; Class. Global correct = 76.9%; AUC=0.758 CI 95%=[0.702;0.814]; [a]Philadelphia Mindfulness Scale. [b]Wong and Law Emotional Intelligence Scale. [c]Perseverative Thinking Questionnaire.

Furthermore, the results revealed that for each additional unity of mindfulness, in its acceptance component (PHLMS), the possibility of having high emotional symptomatology decreases 6.6% (OR=0.934; IC95% = [0.896;0.974]). Each additional unity of emotional intelligence, in its use of emotions component (WLEIS), decreases the chance of having high emotional symptomatology, in 11.4% (OR=0.886; IC95% = [0.826;0.951]). For each additional unity in emotional intelligence in its emotions regulation component (WLEIS), the possibility of presenting high emotional symptomatology decreases 9.9% (OR=0.905; IC95% = [0.846;0.968]). Each additional unity of PNT, in its interference and unproductivity component (PTQ), increasing the possibility of presenting high emotional symptomatology by 6% (OR=1.060; IC95% = [1.017;1.103]).

In summary, mindfulness in terms of acceptance, EI in terms of use of emotion and regulation of emotion, and PNT in terms of intrusiveness, contributed to significantly discriminate between patients with low and high symptomatology.

4. Discussion

The goal of this study was to explore the influence of dispositional mindfulness, emotional intelligence, and perseverative negative thinking in explaining individual differences in emotional symptomatology in a clinical sample.

Regarding sex differences, in this sample, 78.3% of women presented high emotional symptoms, while in men this was only verified in 67.9%, with a significant relation being observed between emotional symptomatology and this variable. Also, Apóstolo et al. (2008), in a study of a sample referring to primary health care showed that women presented higher mean levels of anxiety and depression, than men. Angst et al. (2002) reconfirms the higher prevalence rates in the female gender for major depression, referring that this sex differences are strong, important, and involving complex causes. Moreover, Nolen-Hoeksema et al. (1999) concluded that women bear a triad of vulnerabilities to depressive symptoms: more chronic tension, more tendency to ruminate when anguished and a sense of less mastery of their lives.

Concerning age, in our study, it was verified a non-significant tendency for a relation between age and emotional symptomatology, with the low emotional symptoms group, presenting, on average, a higher age. These results are in accordance with results from other authors, namely Fiske et al. (2009), who reported that depression is less prevalent between older adults then among younger adults, although depression in older adults deserves more attention because it

might have more serious negative consequences. Gallo et al. (1994) explains that the results indicate that, even considering the differences attributed to the global level of depressive symptoms, as well as sex, minority status, education, marital status, employment and cognitive commitment, dysphoria and anhedonia were less probable of being found in people with 65 years old or more. According to Nolen-Hoeksema and Aldao (2011), as we get older, we emphasize emotional regulation and we become better in doing so, and this more effective emotional regulation might explain why the rates of emotional problems, such as depressive symptoms, are likely to decline with age.

The results showed that mindfulness, namely in terms of acceptance, is related to less emotional symptomatology, something also found by other authors (e.g., Baer et al., 2006; Barcaccia et al., 2020; Crego et al., 2020; Enkema et al., 2020). Indeed, scientific literature concerning this theme clearly shows that mindfulness facilitates an adaptive psychological functioning, is positively associated with psychological health and that its training has positive effects, such as the increase of subjective well-being, the reduction of psychological symptoms and of emotional reactivity, as well as improvement of behavioral regulation (Enkema et al., 2020; Galante et al., 2021; Keng et al., 2011; Teixeira et al., 2022). Also, it seems to contribute to improve academic performance in students (Heshmati & Pellerone, 2018).

Davis and Hayes (2011) show that mindfulness-based meditation is negatively associated with rumination and directly related to an effective emotional regulation. According to Brown and Ryan (2003), mindfulness as trait predicts more daily autonomous activity and low levels of unpleasant affect (measured in terms of intensity and frequency) and higher mindfulness levels are related to greater well-being. Keeping in mind this perspective, that mindfulness is associated with less emotional symptomatology and to other factors that promote well-being, such as empathy, self-esteem, and the reduction of anxiety and depression, we can say that by increasing mindfulness levels, we can empower individuals to a better symptomatology control, with an improvement in their quality of life, as suggested by a recent meta-analysis (Galante et al., 2021). Therefore, mindfulness-based approaches such as stress reduction programs, based in mindfulness (MBSR; Mindfulness based stress reduction) or more directed therapies, such as mindfulness based cognitive therapy (MBCT; Mindfulness based cognitive therapy) might have an important role in the reduction of symptoms and in the improvement of well-being.

Concerning EI, the results obtained in this study show a significant relation of emotional symptomatology, specifically in terms of emotion use and regulation, since EI values are higher in people with low symptomatology (e.g., Tolsa & Malas, 2022). This study is in accordance with the results found by other authors that associate a higher level of EI with a higher level of well-

being, positive humor, and self-esteem (Loi & Pryce, 2022; Llamas-Díaz et al., 2022; MacCann et al., 2022; Schutte et al., 2002). Previous meta-analyses concluded that there is a significant relationship between EI and mental health and that a higher level of EI is significantly associated with a better state of health (Martins et al., 2010; Schutte et al., 2007) and lower levels of perceived stress (Cîrstoveanu et al., 2020). Schutte and Malouff (2011) verified, also, that higher levels of EI were associated with higher levels of positive affect, lower levels of negative affect and a higher satisfaction with life. Teixeira et al. (2019) refer EI psychological inflexibility, mindfulness, and emotional regulation as interrelated constructs in individuals with emotional deregulation (mainly anxiety and/or depression). Carmeli et al. (2009) verified that individuals with higher levels of EI reported higher levels of life satisfaction, of self-acceptance and self-esteem. Hertel et al. (2009) showed that three types of mental pathology (namely major depression, borderline personality disorder and substance abuse) are associated with significant deficits in terms of emotional capacities, such as the capacity to understand emotional information. These results seem to be useful in determining the recommendations to interventions that stimulate EI in the attempt to prevent or reduce these symptoms and improve well-being and quality of life.

In what concerns PNT, the results showed that this variable has a positive relation with emotional symptomatology, as suggested by previous studies (Trick et al., 2016; Wahl et al., 2019; Zagaria et al., 2023). Nolen-Hoeksema (2000) showed that rumination predicts depressive symptoms, as well as sub clinic depressive symptoms and/or anxiety symptoms and concluded that rumination is a risk factor for bulimic symptoms, major depression, and substance abuse in female adolescents. Segerstrom et al. (2000) also refer that repetitive thinking is related to anxiety and depression. These results lead to the idea that certain strategies can be established to promote the control of PNT to control emotional symptomatology.

5. Limitations and future research

It is important to note some limitations in this study. First, this is a cross-sectional study, which does not allow to make inferences about the direction of the relations established. Future studies should employ a longitudinal approach to better understand the relationships among these variables. Secondly, data rely only on self-report instruments, what can reduce the validity of results and leading to some biases. Thirdly, this study used a clinical sample, which limits the representativeness and the generalizability of the results. The relations between these variables should also be examined in non-clinical samples in future studies.

Finally, participants were not asked if they practiced mindfulness or some other type of technique or approach, which might have affected the individuals' psychological functioning

namely among study variables. Future studies should compare levels of emotional symptomatology among those practicing mindfulness (or other similar techniques) and those not practicing.

While the current study sheds light on the relationships between mindfulness, emotional intelligence, and PNT with emotional symptomatology, it is crucial to consider potential alternative explanations for these results. One such consideration is the presence of shared variance among these constructs, given their content proximity and the reliance on self-report questionnaires for their measurement. The inherent interconnectedness of these variables may contribute to the observed associations.

It is noteworthy that our study did not delve into the specific mechanisms through which mindfulness and emotional intelligence influence emotional symptomatology. Subsequent research endeavors should aim to investigate these underlying mechanisms more comprehensively, providing a deeper understanding of the associations observed in this study. Indeed, while most theoretical models point out the link between psychological constructs and individuals' well-being, most of them fail to explain how and why they are linked (Merlo et al., 2022; Myles, 2021). Thus, further research is needed to better disentangle these links.

6. Conclusion and practical implications

Overall, our findings suggest that emotional symptomatology is likely to be explained by several factors related to individual cognitive and emotional resources, namely mindfulness, EI, and PNT, even when their inter-relationships are considered. Additionally, because women are more likely to experience emotional symptomatology, these variables can be of particular importance for working with women. Thus, the findings have important implications for interventions.

The exploration of mindfulness-based approaches, along with training of emotion regulation and PNT control, could be considered as potential aids in managing emotional symptomatology and enhancing quality of life and well-being. This may be particularly relevant for clinical populations at experiencing emotional symptoms. Additionally, strategies aimed at reducing PNT, supported by specific techniques and specialized assistance, might contribute positively to alleviating emotional symptomatology. These approaches hold promise for both, preventing and addressing mental health conditions, potentially reducing their prevalence, and enhancing the overall well-being of individuals and society. However, longitudinal, and experimental studies are needed to better understand how these variables contribute to explain emotional symptomatology and how we can use them to improve individuals' mental health.

Ethical approval

This study was submitted and approved by the Board of Directors of the Mental Health Clinic, as well as by members of the University of Beira Interior, Health Sciences Faculty, Covilhã, Portugal (Approval number: 2; 5 February 2020), which comprised experts from different health science fields and constitutes institutional research ethics review and approval.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Data availability statement

Data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

Conflict of interest statement

The authors declare no conflict of interest.

Authors' contribution

The authors confirm contribution to the paper as follows: study conception and design: TM, RJT, PV; FC; data collection: TM; FC; analysis and interpretation of results: TM; RJT; PV; CN; draft manuscript preparation: all authors. All authors reviewed the results and approved the final version of the manuscript.

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DOI: 10.13129/2282-1619/mjcp-3862