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COIMBRA

Bárbara Gomes Pereira

DEVELOPMENT AND APPLICATION OF THE EUROPEAN PORTUGUESE VERSION OF THE MULTIDIMENSIONAL EMOTIONAL DISORDER INVENTORY (MEDI)

Tese no âmbito do Mestrado Integrado em Psicologia Clínica e da Saúde, Subárea de Especialização em Intervenções Cognitivo-Comportamentais nas Perturbações Psicológicas da Saúde orientada pelo Professor Doutor Marco Pereira e Professora Doutora Maria Cristina Canavarro e apresentada à Faculdade de Psicologia e de Ciências da Educação.

Junho de 2021

Faculdade de Psicologia e de Ciências da Educação
da Universidade de Coimbra

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Resumo

Devido ao crescente apoio dado às abordagens transdiagnósticas na saúde mental, torna-se importante ter um único instrumento que avalie brevemente as dimensões transdiagnósticas das perturbações emocionais. Neste estudo apresentamos os estudos de validação em Português Europeu do *Multidimensional Emotional Disorder Inventory* (MEDI), um questionário de auto-resposta que avalia as nove dimensões transdiagnósticas empiricamente apoiadas e propostas no perfil de Brown e Barlow (2009) para a classificação das perturbações emocionais: temperamento neurótico, temperamento positivo, humor depressivo, ativação autonómica, ansiedade somática, ansiedade social, cognições intrusivas, reexperienciamento traumático e evitamento. A estrutura fatorial, fiabilidade e validade do MEDI foram avaliadas numa amostra comunitária (N = 515), maioritariamente do sexo feminino (63.3%) e com uma idade média de 26.18 anos. Para além do MEDI, os participantes completaram os seguintes questionários de autorresposta: Inventário de Sintomas Psicopatológicos (BSI), NEO-Five Factor Inventory (NEO-FFI), Questionário de Avaliação da Perturbação Pós Stress Traumático (PCL-C) e Questionário de Aceitação e Ação II (AAQ-II). A solução final de 49 itens revelou um bom ajustamento aos dados, apesar do CFI estar abaixo do limiar aceitável. As intercorrelações entre as dimensões foram no sentido esperado, e consistentes com as validações existentes. Todas as dimensões do MEDI apresentaram fiabilidade aceitável, com exceção da ansiedade somática, que se encontrou ligeiramente abaixo do limiar recomendado (.69). As correlações entre as dimensões do MEDI e as outras medidas apoiaram a validade convergente de todas as nove dimensões do MEDI. Apoiando a validade dos grupos conhecidos, os resultados demonstraram que o MEDI é capaz de discriminar entre indivíduos em risco de perturbação emocional e aqueles que não estão em risco, com base no ponto de corte do Índice de Sintomas Positivos (ISP $\geq$ 1.7). Dado que as perturbações emocionais são prevalentes em Portugal, o MEDI torna-se extremamente útil em contextos clínicos e de investigação, na medida em que proporciona uma avaliação eficiente de vários traços e fenótipos de perturbações emocionais bem estabelecidos.

Palavras-chave: perturbações emocionais, fiabilidade, transdiagnóstico, validade.

Abstract

Due to the growing support given to the transdiagnostic approaches in mental health, it becomes important to have an instrument that uniquely and briefly assesses the transdiagnostic dimensions of emotional disorders. In the current study, we presented the European Portuguese validation studies of the Multidimensional Emotional Disorder Inventory (MEDI), a self-reported questionnaire that assesses nine empirically supported transdiagnostic dimensions proposed in the Brown and Barlow (2009) profile approach to the classification of emotional disorders: neurotic temperament, positive temperament, depression mood, autonomic arousal, somatic anxiety, social anxiety, intrusive cognitions, traumatic reexperiencing and avoidance. The MEDI factor structure, reliability, and validity was evaluated in a community sample (N = 515), mostly female (63.3%) and with a mean age of 26.18 years. In addition to the MEDI, participants also completed the following self-reported measures: Brief Symptom Inventory (BSI), NEO-Five Factor Inventory (NEO-FFI), Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C); and Acceptance and Action Questionnaire-II (AAQ-II). The final 49-items solution fit the data well, despite the CFI below the acceptable threshold. Intercorrelations among dimensions were in the expected direction, and consistent with existing validations. All dimensions of the MEDI had acceptable reliability, with the exception of somatic anxiety, which was slightly below the recommended threshold (.69). The correlations between the nine MEDI dimensions and other relevant measures supported the convergent validity of all dimensions. Supporting the known-groups validity, the results demonstrated that the MEDI was able to discriminate between the individuals at risk for emotional disorder and those who were not at risk, based on the Positive Symptom Distress Index cutoff point (PSD ≥ 1.7) from the BSI. Considering that emotional disorders are prevalent in Portugal, the MEDI becomes particularly useful in clinical and research settings, as it provides an efficient assessment of several well-established emotional disorder traits and phenotypes.

Keywords: emotional disorder, reliability, transdiagnostic, validity.

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Introduction

The aim of the present study was to present the psychometric properties of the European Portuguese version of the Multidimensional Emotional Disorder Inventory (MEDI), an inventory that was developed to assess the nine empirically supported transdiagnostic dimensions proposed in the Brown and Barlow (2009) profile approach to emotional disorder classification. There is a clear advantage of using the dimensional assessment of transdiagnostic emotional disorders in clinical and research. Accordingly, the MEDI fulfills this purpose by offering information above and beyond the DSM categorical assessment, including the detection of subclinical symptoms and symptom change.

In terms of structure, the study begins with a theoretical framework, where topics such as the categorical system, the dimensional system, the ten dimensions of Brown and Barlow's (2009) profile, a brief presentation of emotional disorders and a theorical introduction to the MEDI are addressed. Next, the method is presented, where information about the study participants, the data collection and study-related procedures, the measures used and the data analyses performed are characterized. The results obtained in each of the analyses performed are exposed, specifically: distributional characteristics of items, scale correlations, means and reliabilities, confirmatory factor analysis, concurrent validity and known-groups validity. The last section is the discussion, which includes reflections of the study, some interpretations of the results, the contributions and the limitations of the study and a brief conclusion.

The validation of this measure in Portugal will bring the possibility of having a specific questionnaire that can assess the main transdiagnostic processes involved in maintaining emotional problems, avoiding the application of numerous self-reported questionnaires, which are not only exhausting for professionals, but also for patients. The MEDI has also the advantage and may be used by researchers and clinicians to study which transdiagnostic processes may be maintaining the disorder and finding more specific and personalized treatment plans (Barlow et al., 2004).

Theorical Framework

Categorical System

The current diagnostic system for mental health disorders, exemplified by the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), is characterized by the division of psychopathology into as many discrete disorders as it can be reliably diagnosed (Boettcher et al., 2020). However, the theory of psychopathology, along with empirical evidence, have led to some criticisms of this approach, especially for the excessive split of disorders into potentially artificial categories (Barlow et al., 2014).

According to Brown and Barlow (2009), several investigations have pointed out some errors in measurement levels due to operationalizing and applying a categorical cutoff on dimensional features (such the severity, frequency and duration of symptoms) and biased rates of diagnostic comorbidity as a result of overlapping criteria sets and diagnostic decision rules. These criticisms had been made to the earlier version DSM-IV, and accordingly, the DSM-V has tried to amend these shortcomings. However, although it has advanced, no well-defined alternative nosological systems have been articulated to address these limitations (Brown & Barlow, 2009), and even the National Institutes of Mental Health (NIMH) claimed that the "modest" revisions failed to provide a much-needed transition away from the symptom-based classification (Insel, 2013). According to the NIMH, the DSM-V has over-emphasized reliability at the expense of validity by focusing only on symptoms and ignored key information about cognitive, biological, and genetic features of mental disorders, as well as the dimensionality of these disorders (Rosellini, 2015). As pointed out by Brown et al. (2001), the categorical systems used to classify mental disorders do not reflect the dimensional nature of disorders, which leads to high levels of comorbidity. In fact, empirical research has shown commonalities rather than differences among emotional disorders (Bernstein et al., 2010). Many diagnoses of mental disorders often co-occur and share similar criteria, which raises the question of whether they are sufficiently different to constitute distinct disorders (Boettcher et al., 2020). Additionally, as noted by Guerrero (2019), individuals with different diagnoses have been shown to respond similarly to the same treatment while individuals with the same diagnosis may respond differently to the same intervention.

Dimensional System and the 10 Dimensions of Brown and Barlow (2009)

Given the limitations of the categorical classification system, Brown and Barlow (2005) proposed to introduce dimensional severity ratings to the existing diagnostic categories and/or the constituent symptom criteria (according to the procedures used in the Anxiety and Related

Disorder Interview Schedule [ADIS-IV-L], where interviewers attribute a 0 to 8 clinical severity rating to indicate the degree of distress and lifestyle impairment associated with the disorder; cf. Brown et al., 1998). However, despite the advantages of this novel approach, a dimensional system of this nature would not address the problem of high diagnostic comorbidity (Brown & Barlow, 2009). Indeed, some theories and evidence showed that the overlap in families of mental disorders, such as comorbidity and symptom overlap in anxiety and mood disorders, was due to the fact that these mental health conditions emerge from shared biological, genetic, and psychosocial diatheses (e.g., Barlow, 2002; Kendler et al., 1992). Therefore, other proposals were suggested, which stressed dimensions corresponding to wider biologically and environmentally based constructs of temperament and personality, such as neuroticism (Clark, 2005). One of the most innovative proposals was offered by Brown and Barlow (2009), who developed a 10 transdiagnostic dimensional model for emotional disorders.

The higher-order model developed by Brown and Barlow (2009) incorporates two key genetically-based core dimensions of temperament in the etiology and development of emotional disorders: the *neurotic temperament,* which reflects the tendency to experience a negative effect in response to subjectively threatening triggers (e.g., neuroticism, behavioral inhibition, negative affectivity) and the *positive temperament,* which is the tendency to experience a positive effect in response to goal-oriented social activities (e.g., extraction, behavioral activation, positive affectivity). Neurotic and positive temperament are part of the classification system because they are associated with the onset, severity, co-occurrence, and course of many emotional disorders and related symptoms (Barnett et al., 2011; Brown et al., 1998).

This hybrid dimensional-categorical profile approach also includes eight lower-order transdiagnostic phenotypes to specify the nature of the problem and ease the treatment planning (Brown & Barlow, 2009). This transdiagnostic phenotypes are defined as follows: *depressed mood and mania* dimensions, which respectively capture excessive sadness and positive affect that frequently co-occur with other emotional disorders (Brown et al., 2001; Rosellini & Brown, 2019)*; autonomic arousal,* which is characterized by the experience of physiological symptoms due to sympathetic activation of the nervous system (i.e., panic symptoms), very typical in the general population (Kessler et al., 2006); the assessment of this dimension is useful because panic attacks and their symptoms "can occur in the context of any mental disorder" (DSM-V); *somatic anxiety*, which is incorporated to reflect anxiety focused on somatic symptoms and associated worry about health; the dimension *social anxiety* that represents fear of negative evaluation in situations of interaction and performance (Rosellini & Brown, 2019) and is a defining feature of social anxiety disorder, which has been observed across several emotional disorders, particularly generalized anxiety disorder (Rapee et al., 1988) and depression (O'Connor et al., 2002); *intrusive cognitions* relate to the experience of uncontrollable thoughts, images and impulses; this

dimension is a defining characteristic of obsessive-compulsive and related disorders, but has also been observed among other emotional disorders such as generalized anxiety (Brewin et al., 2010; Tallis, 1999); the dimension *traumatic reexperiencing* can be defined as the experiences of negative effect, dissociation, and flashback centered on past traumatic events; it is the defining feature traumatic and stress disorders, but there is also evidence of reexperience symptoms in the context of panic attacks (Hagenaars et al., 2009) and social anxiety disorders (Carleton et al., 2011); finally, *avoidance* is defined as the behavioral and cognitive strategies to prevent or reduce the intensity of acute states of negative or positive affect. Overall, these eight lower-order dimensions were selected because of the evidence showing that neuroticism and extraversion alone would not provide adequate information about the foci of emotional disorders symptoms (Brown & Barlow, 2009). In fact, the system classification proposed by these authors, by suggesting new ways of understanding, is the only one that has implications for treatment planning and opens the door for new ways of assessment.

Emotional Disorders

This new alternative to classic categorical systems is known to be valuable for all mental disorders, nevertheless essential for emotional disorders, because of their high levels of comorbidity and high prevalence around the world (Guerrero, 2019). Emotional disorders contain many disorders that are associated with intense emotional states that cause interference in patient's everyday lives during a long period of time, such as anxiety and depression (Barlow et al., 2004).

In Europe countries, according to the latest Institute for Health Metrics and Evaluation (IHME) estimates, more than one in every six people (17.3%) had a mental health problem in 2016, which corresponded to nearly 84 million people. According to the same estimates, across EU countries, the most common mental disorder is anxiety. An estimated 25 million people (5.4% of the population) suffer from anxiety, followed by depression, which affects 21 million people (4.5% of the population). By country, the estimated prevalence of mental health disorders is highest in Finland, the Netherlands, France, Ireland and Portugal (with rates of 18.4% or more of the population with at least one disorder). In Portugal, anxiety disorders (16.5%) and mood disorders (7.9%) are the most prevalent psychiatric disorders. It is also known that depressive symptoms affect 10% of the Portuguese population (Conselho Nacional de Saúde (CNS), 2019).

In addition to the high levels of prevalence and comorbidity of emotional disorders, there are taxometric studies that suggest that the structure of these disorders is dimensional rather than categorical for a variety of constructs, including depressed mood, worry, social anxiety, and somatic symptoms (Kliem et al., 2014; Olatunji et al., 2010). Taken together, these issues suggest that emotional disorders may be better understood through a classification system more focused on dimensional processes.

Several attempts have been made to conduct a preliminary evaluation of the validity of a profile approach to emotional disorder classification. However, these proposals encompassed some limitations and none of these could be used to assess all the dimensions included in the Brown and Barlow's (2009) approach. For example, the Research Domain Criteria (RDoC) project, launched by the National Institute of Mental Health (Insel et al., 2010), includes five dimensions of psychological processes (negative and positive valence, cognitive, social, and arousal/regulatory processes) that contribute to mental health generally, and not emotional disorders specifically. However, as noted by Boettcher et al. (2020), these dimensions and their subfacets were too nonspecific and cannot be translated into clinical practice. Another example is the approach Hierarchical Taxonomy of Psychopathology (HiToP), recently proposed by Kotov et al. (2017). This taxonomy classifies all psychopathology in a multilevel framework of symptom dimensions ranging from higher-order spectra to narrow maladaptive processes. While HiToP offers both specificity and comprehensiveness, Boettcher et al. (2020) suggested that there is no way to assess the complete framework parsimoniously.

Existing measures also provide a rather limited assessment of the broad set of emotional disorder dimensions delineated in the profile proposed by Brown and Barlow (2009). For example, the 42-item Beck Depression and Anxiety Inventories (Beck et al., 1996) or the 21-item Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995) can only be used to assess depressed mood and autonomic arousal. In a similar way, many other measures are limited by the use of non-specific constituent items. Even the measures of personality/psychopathology developed to detect all major mental health conditions (e.g., Minnesota Multiphasic Personality Inventory-2- Restructured Form, MMPI-2-RF) cannot be used to assess all dimensions in this profile (Rosellini & Brown, 2019). Thus, the only way to assess the wide range of empirically identified emotional disorder traits and lower order phenotypes would imply the application of numerous self-report questionnaires, which could be significantly burdensome. Therefore, this need to have a measure that allows a rapid and effective assessment was accomplished by the development of Multidimensional Emotional Disorders Inventory (MEDI).

Multidimensional Emotional Disorders Inventory

Given the evidence showing that the dimensions proposed by Brown and Barlow (2009) are widely recognized by researchers and clinicians, particularly because of the strong support in theory and research (Rosellini & Brown, 2019), there was a need to develop a measure that included and effectively assessed these transdiagnostic dimensions, thus conferring validity to the classification system proposed by Brown and Barlow. Accordingly, Rosellini et al. (2015) developed a dimensional classification measure, which was labelled as Multidimensional

Emotional Disorders Inventory (MEDI), in which the authors analyzed emotional disorders not by their symptoms but by the similarity in their psychological processes.

The MEDI covers nine of the 10 dimensions proposed in the profile by Brown and Barlow (2009): neurotic temperament, positive temperament, depressed mood, autonomic arousal, somatic anxiety, social anxiety, intrusive cognitions, traumatic reexperiencing, and avoidance. The MEDI is a self-report measure and comprises 49 items that aimed to assess transdiagnostic vulnerabilities and phenotypes for a profile approach to emotional disorder classification. This inventory is unique because it is intended to provide a brief but at the same time a rich assessment of temperament/ personality processes and other transdiagnostic phenomena commonly found across emotional disorders (Rosellini et al., 2015).

The MEDI is a new approach and has several advantages. One important advantage of is that it was designed to be transdiagnostic in nature, which means that the items emphasize features of each phenotypes that intersect multiple DSM disorder categories. For example, the items on intrusive cognitions focused on the intrusive nature of thoughts and images (e.g., "I have thoughts or images that I find unacceptable") rather than in too specific thoughts or image content (e.g., related to stress factors, contamination, sex, violence, etc.) (Rosellini et al., 2015). Another strength of the MEDI is its usefulness in psychopathological research and in clinical contexts. Most of its dimensions are also assessed by other measures but typically use 20 or more items. With the MEDI, researchers and clinicians can evaluate these dimensions in more parsimoniously and briefly way. It is also possible to use these results together with functional analysis to build the cognitive-behavioral treatment plan (Guerrero, 2019). In a clinical setting, the MEDI would provide the scores of each individual that would allow creating a profile of each patient indicating the main processes that maintain the emotional disorder. For example, regardless of the patient's diagnosis, if he/she had high levels of avoidance, their treatment should be oriented to techniques that contribute to decrease interoceptive avoidance. In other words, despite of the mental disorder diagnosis made according to a categorical classification, assessing and finding the transdiagnostic processes that are maintaining the disorder may lead to a more unique and personalized treatment plan (Barlow et al., 2004; Gallagher, 2017). A further usefulness is that only with the MEDI it is possible to assess the dimensions of Brown and Barlow's (2009) profile without being forced to choose several different and sometimes long measures. This may prevent some problems, such as the assessment of symptoms instead of transdiagnostic factors and the fatigue of patients who would have to spend a lot of time answering multiple self-reported questionnaires (Guerrero, 2019). Taking into account all these advantages, the MEDI provides a more efficient and effective way of assessing the full range of emotional disorders, including the common standards of comorbidity and the subthreshold symptoms, therefore providing an optimal process and

assessment tool for transdiagnostic treatment approaches such as Unified Protocol (Rosellini, et al. 2015).

The original validation study of the MEDI in a clinical sample showed its ability in assessing traits and phenotypes associated with the development, expression, and maintenance of a range of DSM emotional disorders (Rosellini & Brown, 2019) and supported the structure that covers the nine dimensions proposed by Brown and Barlow (2009). All dimensions had acceptable composite reliability (ρ range = .68 – Avoidance - to .93 – Intrusive cognitions) and a large factor determinacy (range = .84 to .98), which indicated acceptable validity of the factor/dimension scores. Regarding the correlations (Φ – completed standardized correlation) between the nine MEDI dimensions and other measures, the results showed strong correlations between the MEDI factors and their respective convergent validity measure: MEDI-Neurotic Temperament and NEO-FFI-Neuroticism (Φ = .79); MEDI-Positive Temperament and NEO-FFI-Extraversion (Φ = .86); MEDI-Depressed Mood and DASS-Depression (Φ = .91); MEDI-Autonomic Arousal and DASS-Anxiety (Φ = .90); MEDI-Social Anxiety and SIAS (Φ = .92); MEDI-Intrusive Cognitions and OCI-R-Obsessions (Φ = .90). Despite significant, MEDI-Avoidance was only moderately correlated with MEAQ-Distress Aversion (Φ = .49).

In addition to the original study, this inventory has been only validated in Colombia, in a community sample, also with evidence of adequate reliability and validity (Guerrero, 2019). Similar to the original validation, in the validation study of the Colombian version, most of the MEDI dimensions had large factor determinacies (Traumatic re-experiencing and intrusive cognitions = .92; Social anxiety = .87; Somatic anxiety = .81; Depression = .80 and Autonomic arousal = .84), which indicated acceptable validity of the factor scores; the exceptions were the dimensions neurotic temperament (.72), positive affect (.75) and avoidance (.69), which did not present good validity (Guerrero, 2019). The MEDI validation in the Colombian context also revealed a god fit of the nine-factor model, however, the elimination of one item (item 46) was excluded from this version (Guerrero, 2019). The correlations between MEDI dimensions were in the expected direction and consistent with the original validation study.

However, to the best of our knowledge, there are no other validation studies of the MEDI, which increases the importance of developing the validation study in different cultures, including the Portuguese context. Because the MEDI has only been validated so far in two countries, there is a need to implement it in different contexts, cultures and populations, as a mean to verify the universality of the transdiagnostic constructs of emotional disorders. The importance of validating the MEDI in Portugal is based on the possibility of having a specific measure that can assess the main transdiagnostic processes involved in maintaining emotional problems, which, as noted before, are highly prevalent in Portugal (with more than 10% of the population complaining of anxiety and depression in 2016, according to the IHME). With this validation, we can provide to

Portuguese clinicians a briefly specific questionnaire able to measure the core transdiagnostic processes involved in the maintenance of emotional problems, which would contribute to more effective planning treatments and consequently achieve better results.

Method

Participants

The study sample consisted of 515 individuals of the community (326 women; *M* = 26.18 years, *SD* = 8.22; range: 18-63). Most participants reported to be single (56.6%), not having children (88.3%), having university studies (80%), being currently studying (44.7%) and living in urban areas (65.6%). Regarding the clinical characteristics, most participants did not report presence of physical health problems (85.8%) or psychological problems (76.7%). Among the participants who reported presence of psychological problems, 151 reported having psychological/psychiatric counseling or have had it in the past. The detailed characteristics are presented in Table 1.

Table 1. Sociodemographic and clinical characteristics of the sample

	n	**%**
Gender		
Male	189	36.7
Female	326	63.3
Marital status		
Single	290	56.3
Married	49	9.5
De facto union	26	5.0
In a relationship (without living together)	143	27.8
Divorced	7	1.4
Children		
Yes	60	11.7
No	455	88.3
Education		
≤ 9 years	7	1.4
10-12years	96	18.6
University Studies	412	80.0
Professional status		
Employed	214	41.6
Unemployed	41	8.0
Student	230	44.7
Worker-Student	29	5.6
Retired	1	0.2

Residence		
Rural Areas	177	34.4
Urban Areas	338	65.6
Physical health problem		
Yes	68	13.2
No	442	85.8
Don’t know/Don't want to answer	5	1.0
Psychological/psychiatric health problem		
Yes	111	21.6
No	395	76.7
Don’t know/Don't want to answer	9	1.7
Currently taking psychiatric medication		
Yes	35	6.8
No	479	93.0
Don’t know/Don’t want to answer	1	0.2

Procedures

Participants were invited through mailing lists of the researchers (e.g., student contacts) and social networking messages (e.g., Facebook and Instagram) to participate in an online survey on emotional disorders and the development of the European Portuguese version of the MEDI. Before carrying out any study-related process ethical approval was obtained from the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra. After being informed about the main objectives of the study, the inclusion criteria to participate, the composition of the research team, the role of researchers and participants, how the results will be disseminated, and the contacts for additional information, participants were provided with the option to give their informed consent (i.e., clicking on the "I agree to participate in the study" option). Subsequently, participants were redirected to a set of questions about their sociodemographic and clinical information and a set of self-reported questionnaires.

Measures

Sociodemographic and clinical data

The first part of the questionnaire focused on sociodemographic information and asked about gender, age, educational level, as well as employment and marital status. Clinical data included questions about the presence of physical health problems as well as psychiatric or

psychological problems, including, if applicable, current diagnosis, attendance of psychiatric or psychological appointments and medication.

Multidimensional Emotional Disorder Inventory (MEDI)

The Multidimensional Emotional Disorder Inventory (Rosellini & Brown, 2019), which is under study, is a self-reported questionnaire designed to assess the transdiagnostic dimensions included in the Brown and Barlow's (2009) approach to emotional disorder's classification. It has a total of 49 items, which are rated on a nine-point response scale ranging from 0 (*not characteristic of me/does not apply to me*) to 8 (*extremely characteristic of me/applies to me very much*). The MEDI assesses the following nine dimensions: neurotic temperament (5 items; e.g., "I get upset by trivial things."), positive temperament (5 items; e.g., "I am an optimistic person."), depressed mood (5 items; e.g., "I feel sad and blue."), autonomic arousal (5 items; e.g., "I have been experiencing rushes of fear that come on very suddenly."), somatic anxiety (5 items; e.g., "I am preoccupied by illnesses and diseases."), social anxiety (5 items; e.g., "I am uncomfortable mingling at social events."), intrusive cognitions (6 items; e.g., "Unpleasant thoughts, images, or memories come into my mind against my will."), traumatic reexperiencing (5 items; e.g., "I have disturbing dreams about awful events that occurred in my past."), and avoidance (8 items; e.g., "I will do almost anything to get rid of unpleasant feelings."). In the original validation (Rosellini & Brown, 2019), the nine MEDI dimensions showed good convergent and discriminant validity with other well-established measures of emotional disorder symptoms, as well as acceptable reliability.

Brief Symptom Inventory (BSI)

The Brief Symptom Inventory (Derogatis, 1982; Portuguese version by Canavarro, 2007) was used to assess the psychopathological symptoms. It has a total of 53 items, rated on a five-point response scale with reference to the last week from 0 (*Not at all/Never*) to 4 (*Extremely/A lot of times*). The scores were obtained for nine primary symptom dimensions (somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, psychoticism and paranoid ideation) and three global indices of psychological distress (Global Severity Index [GSI], Positive Symptom Distress Index [PSD], and Positive Symptom Total [PST]). In the Portuguese version (Canavarro, 2007), alpha coefficients for the nine dimensions ranged from .62 (phobic anxiety and psychoticism) to .80 (somatization). In this study, Cronbach alphas for the dimensions ranged from .77 (hostility and psychoticism) to .88 (depression).

NEO-Five Factor Inventory (NEO-FFI)

The NEO-Five Factor Inventory (Costa & McCrae, 1989; McCrae & Costa, 2004; Portuguese version by Magalhães et al., 2014) is a shortened version of The Revised NEO Personality Inventory (NEO-PI-R). This instrument was designed to provide a concise measure of the five basic personality factors: Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness. The NEO-FFI consisted of 60 items (12 items for each dimension) and uses a five-point response format, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). In the present study, only the Neuroticism and Extraversion subscales were used. In the Portuguese validation study, these subscales showed satisfactory internal consistency (.81 for Neuroticism and .75 for Extraversion) (Magalhães et al., 2014). In the sample of this study, the reliability values were .88 for Neuroticism and .76 for Extraversion.

Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C)

The Posttraumatic Stress Disorder Checklist – Civilian Version (Weathers et al., 1991; 1993; Portuguese version by Marcelino & Gonçalves, 2012) was used to assess symptoms of PTSD in civilian populations and consisted of 17 items that correspond to the criteria of DSM-VI-TR for PTSD: B (reexperience), C (avoidance) and D (hyperactivation). Each item of this scale is rated on a five-point response scale, ranging from 1 (*Not at all*) to 5 (*Extremely*). Scores that were equal to three or higher indicated the presence of symptoms of PTSD. To assess the criteria A of DSM-VI-TR, a question adapted from the Traumatic Events Questionnaire (TEQ) was also asked. This question was rated on a seven-point response scale, ranging from 1 (*Not at all*) to 7 (*Extremely*). The reliability of this scale in the Portuguese validation was .94 for the total PCL-C and .86, .87 and .88 for criteria B, C and D, respectively (Marcelino & Gonçalves, 2012). In our sample, the internal consistency was .94 for the total scale and .87 for criteria B, C, and D.

Acceptance and Action Questionnaire-II (AAQ-II)

The Acceptance and Action Questionnaire (Bond et al., 2011; Portuguese version by Pinto Gouveia et al., 2012) was used to assess the psychological flexibility/ inflexibility. The AAQ-II consists of 7-items, which are rated on a seven-point response scale, ranging from 1 (*never true*) to 7 (*always true*). In the AAQ-II, higher scores denote higher psychological inflexibility. Regarding its psychometric characteristics, in the Portuguese validation study the reliability of the AAQ-II was very good, with Cronbach's alpha coefficients over .89 (Pinto-Gouveia et al., 2012). In the sample of this study, the Cronbach's alpha was .92.

Data Analyses

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS), version 25.0 (IBM Corp., Armonk, NY). Confirmatory factor analysis (CFA) was executed using the Analysis of Moment Structure (AMOS), version 22.0. For the sample's characterization, descriptive analyses were performed. The distributional characteristics of items were examined by calculating mean values (*M*) and standard-deviations (*SD*), percentage of missing values, floor and ceiling effects and skewness and kurtosis in the distributions of scores. The reliability of the MEDI was examined through Cronbach's α, where values above .70 are recommended (Tennant & Conaghan 2007). The original factor structure of the MEDI was examined with CFA. The models' goodness-of-fit was assessed based on the maximum-likelihood χ^2 statistic, the ratio χ^2/degrees of freedom (*df*), the comparative fit index (CFI), the root mean square error of approximation (RMSEA) and the standardized root mean squared residual (SRMR). A model was considered to have a good fit when CFI ≥ .95, RMSEA ≤ .06 (p > .05) and SRMR ≤ .08 (Hu & Bentler, 1999). To assess the convergent validity, we correlated the nine MEDI dimensions with other measures that assess the dimensions proposed by Brown and Barlow (2009), such as the BSI and the Posttraumatic Stress Disorder Checklist. Pearson correlations were computed to assess the associations between the MEDI dimensions and other relevant measures and were considered adequate when $r \geq .30$. To test if the MEDI dimensions differentiated individuals in higher risk of developing an emotional disorder, based on the PSD index of the BSI, a multivariate analysis of variance (MANOVA) was performed.

Results

Distributional characteristics of items

Table 2 presents an overview of distributional characteristics of items of the MEDI. The floor effect was detected in most items except for 12 items, including all items of the positive temperament dimension (i.e., more than 15% of respondents achieved the lowest possible score; Terwee et al., 2007). Ceiling effects were generally absent (only three items were above 15%). No substantial deviations from normality were observed in the distribution of most items, considering a coefficient of absolute skewness > 2 and a coefficient of absolute kurtosis > 7 as reference values for samples with more than 300 participants (West et al. 1995), except for items 26 and 43, which showed a skewness > 2 (2.58 and 2.24, respectively).

Table 2. Descriptive statistics for items of the MEDI

Item (No.)	*M*	*SD*	Floor	Ceiling	Skewness	Kurtosis
Neurotic temperament						
Easily Upset (1)	2.70	1.83	14.2	0.2	0.28	-0.73
Always been worrier (10)	4.34	2.40	6.8	11.8	-0.11	-1.05
Poor stress coping (16)	3.36	2.28	10.1	6.2	0.41	-0.76
More keyed up than average (32)	2.93	2.33	20.2	3.1	0.42	-0.89
Feelings hurt easily (35)	3.34	2.33	14.4	5.6	0.27	-0.87
Positive temperament						
Easily laughs (2)	5.84	1.81	0.6	22.1	-0.75	0.12
Optimistic person (17)	5.01	1.93	1.2	10.7	-0.36	-0.51
Cheerful and happy person (24)	5.88	1.57	0.4	14.6	-0.82	0.67
Always motivated (33)	5.15	1.86	1.4	11.5	-0.46	-0.16
Satisfied when finishing jobs (36)	6.76	1.43	0.4	40.2	-1.47	2.79
Depressed mood						
Disappointed in self (3)	2.49	2.24	24.7	1.7	0.67	-0.59
Feel sad (11)	2.43	2.21	25.0	2.5	0.71	-0.44

Loss of interest (25)	2.01	2.09	34.8	1.2	0.92	-0.01
Nothing to look forward to (37)	2.05	2.28	37.5	3.3	1.00	0.02
Life not worth living (43)	0.90	1.71	67.6	1.0	2.24	4.65
Autonomic arousal						
Experiencing breathlessness (4)	1.03	1.72	61.7	0.2	1.86	2.76
Feeling trembling/shaky (13)	1.01	1.64	60.8	0.4	1.81	2.72
Sudden rushes fear (18)	1.25	1.86	55.7	0.8	1.59	1.81
Felt dizzy/lightheaded/faint (26)	0.63	1.39	75.3	0.2	2.58	6.54
High resting heat rate (44)	2.46	2.43	33.0	3.7	0.66	-0.73
Somatic anxiety						
Fears physical sensations (6)	2.26	2.30	31.3	3.5	0.87	-0.27
Worry about health (19)	5.71	1.89	0.4	22.5	-0.65	-0.19
Preoccupied by illnesses (28)	3.26	2.43	17.7	5.4	0.27	-1.00
Closely monitor health (38)	3.57	2.33	10.3	6.0	0.19	-0.97
Believes has undiagnosed illness (45)	1.63	2.26	50.3	2.5	1.35	0.68
Social anxiety						
Uncomfortable mingling (7)	2.01	2.15	36.1	1.4	0.92	-0.14
Uncomfortable center of attention (14)	3.37	2.39	16.3	5.6	0.22	-0.97
Anxious with strangers (22)	2.24	2.14	28.5	1.7	0.75	-0.39
Nervous when talking to others (41)	2.25	2.08	26.2	1.4	0.75	-0.34
Nervous in social situations (47)	2.43	2.21	25.6	2.1	0.71	-0.41
Intrusive cognitions						
Odd thoughts (5)	2.43	2.43	28.7	4.1	0.80	-0.55
Unpleasant thoughts/images (12)	2.44	2.39	30.3	3.9	0.74	-0.57
Inappropriate/nonsensical thoughts (21)	1.82	2.23	42.9	2.7	1.17	0.39
Actions driven by thoughts (30)	0.96	1.48	57.1	0.6	1.81	2.94
Unacceptable thoughts/images (40)	1.14	1.80	55.0	1.6	1.94	3.39
Unrealistic fear of losing control (46)	1.41	2.13	56.1	1.6	1.51	1.16
Traumatic re-experiencing						

Thinking about horrific experiences (8)	1.77	2.01	36.5	1.6	1.20	0.76
Disturbing dreams of past events (20)	1.22	1.86	54.4	1.4	1.76	2.50
Intrusive images of past trauma (29)	1.40	1.98	50.3	1.6	1.54	1.60
Feels like reliving trauma (39)	1.19	1.75	53.2	0.6	1.67	2.27
Distressed by trauma reminders (48)	2.00	2.24	35.5	3.7	1.10	0.33
Avoidance						
Distraction coping (9)	3.02	2.48	22.5	3.7	0.32	-1.15
Avoids upsetting places/things (15)	3.42	2.46	18.1	5.8	0.11	-1.12
Carries protective objects (23)	1.09	1.87	62.3	1.7	1.96	3.31
Gets rid of unpleasant feelings (27)	3.61	2.54	15.1	9.3	0.15	-1.14
Tries to suppress upsetting thoughts (31)	3.70	2.22	8.3	4.5	0.09	-0.93
Avoids feared objects (34)	2.05	2.09	32.0	1.6	0.93	0.01
Routine actions taken to cope (42)	2.46	2.30	29.5	2.3	0.60	-0.73
Fears prevent day-to-day tasks (49)	1.52	1.97	44.7	2.1	1.50	1.68

Scale correlations, means and reliabilities

All correlations between the MEDI dimensions were in the expected directions (see Table 3). MEDI-Neurotic Temperament and Positive Temperament were inversely correlated (r = -.22). MEDI-Neurotic Temperament was positively associated with all phenotype dimensions (rs = .56 to .59), whereas MEDI-Positive Temperament was inversely associated with all phenotype dimensions (rs = -.06 to -.47). All the lower order phenotype dimensions had significant and positive associations (rs = .38 to .79). The internal consistency of the MEDI dimensions varied between acceptable and excellent (α = .70 to .91), except for the dimension Somatic Anxiety, in which the Cronbach's alpha was slightly below .70 (.69).

Table 3. Scale correlations, means and reliabilities

MEDI Factor	NT	PT	DM	AA	SOM	IC	SOC	TRM	AVD
Neurotic temperament	-								
Positive temperament	-.22***	-							
Depressed mood	.57***	-.47***	-						
Autonomic arousal	.57***	-.22***	.59***	-					
Somatic anxiety	.57***	-.08	.41***	.58***	-				
Intrusive cognitions	.59***	-.24***	.63***	.67***	.60***	-			
Social anxiety	.55***	-.30***	.51***	.45***	.38***	.45***	-		
Traumatic re-experiencing	.56***	-.20***	.55***	.62***	.55***	.79***	.45***	-	
Avoidance	.56***	-.06	.48***	.51***	.63***	.58***	.48***	.59***	-
Scale Reliability (α)	.78 [.75, .81]	.70 [.65, .74]	.84 [.82, .86]	.80 [.77, .82]	.69 [.65, .73]	.86 [.84, .88]	.91 [.89, .92]	.87 [.85, .89]	.73 [.69, .76]
Scale *M (SD)*	16.66 (8.22)	28.63 (5.82)	9.88 (8.30)	6.37 (6.84)	16.43 (7.51)	10.20 (9.66)	12.31 (9.35)	7.59 (8.02)	20.86 (10.56)

Note. NT = neurotic temperament; PT = positive temperament; DM = depressed mood; AA = autonomic arousal; SOM = somatic anxiety; SOC = social anxiety; IC = intrusive cognitions; TRM = traumatic re– experiencing; AVD = avoidance.

*** $p < .001$

Confirmatory Factor Analysis (CFA)

In the CFA, at item-level, the original 49-items model of the MEDI had an unacceptable fit to the data, with $x^2(1091) = 2953.39$; $p < .001$; CFI = .85; RMSEA = .058; 90% CI for RMSEA = [.055-.060]; SRMR = .074. For a better fit of the model, the analysis of the modification indices suggested that three pairs of errors may be correlated (item 27 - item 31; item 38 – item 28; item 38 – item 19). After this procedure, the fit of the model increased, despite the CFI value still was below .90: $x^2(1088) = 2678.95$; $p < .001$; CFI = .871; RMSEA = .053; 90% CI for RMSEA = [.051-.056]; SRMR = .067.

Convergent Validity

The convergent validity of the MEDI dimensions was assessed by examining the correlations between the nine dimensions and relevant measures of psychopathological symptoms, personality, posttraumatic stress and psychological inflexibility. Regarding the BSI dimensions, as presented in Table 4, there were strong and significant correlations with the expected dimensions, specifically between MEDI-Autonomic Arousal and BSI-Somatization (r = .74); MEDI-Autonomic Arousal and BSI-Anxiety (r = .74); and MEDI-Depressed Mood and BSI-Depression (r = .83). It is also relevant to mention the moderate correlations between MEDI-Somatic Anxiety and BSI-Anxiety (r = .53) and MEDI-Social Anxiety and BSI-Interpersonal Sensitivity (r = .53). Conversely, there were weak to moderate, negative and significant correlations between all dimensions of the BSI and the MEDI-Positive temperament.

Regarding the correlations with the dimensions of personality, symptoms of PTSD and psychological inflexibility (see Table 5), the MEDI dimensions were moderate to strongly correlated with their convergent validity measure: MEDI-Neurotic Temperament and NEO-FFI-Neuroticism (r = .73); MEDI-Positive Temperament and NEO-FFI-Extraversion (r = .67); MEDI-Intrusive Cognitions and PCL-Total (r = .67); MEDI-Traumatic Re-experiencing and PCL-Total (r = .73); and MEDI-Avoidance and AAQ-II (r = .59).

Table 4. Differential associations of the MEDI dimensions with brief symptom inventory dimensions

MEDI Factor	SOM_BSI	OBC BSI	SI BSI	DEP BSI	ANS BSI	HST BSI	FOB BSI	PAR BSI	PST BSI
Neurotic temperament	.45***	.56***	.54***	.53***	.57***	.51***	.44***	.43***	.50***
Positive temperament	-.16***	-.34***	-.34***	-.42***	-.26***	-.24***	-.20***	-.25***	-.35***
Depressed mood	.45***	.66***	.66***	**.83*** **	.58***	.49***	.45***	.53***	.68***
Autonomic arousal	**.74*** **	.56***	.50***	.55***	**.74*** **	.53***	.58***	.46***	.57***
Somatic anxiety	.46***	.41***	.35***	.35***	**.53*** **	.38***	.47***	.37***	.41***
Intrusive cognitions	.52***	.55***	.53***	.58***	.61***	.56***	.50***	.47***	.65***
Social anxiety	.33***	.51***	**.53*** **	.45***	.44***	.32***	.47***	.34***	.46***
Traumatic re-experiencing	.52***	.53***	.54***	.51***	.59***	.54***	.53***	.46***	.58***
Avoidance	.38***	.49***	.44***	.42***	.51***	.40***	.49***	.41***	.48***

Note. BSI = Brief Symptom Inventory, SOM = somatization, OBC = obsession-compulsion, SI = interpersonal sensitivity, DEP = depression, ANS = anxiety, HST = hostility, FOB = phobic anxiety, PAR = paranoid ideation, PST = psychoticism.

*** $p < .001$

Table 5. Differential associations of the MEDI dimensions with measures of convergent validity

MEDI Factor	NFFI Neuroticism	NFFI Extraversion	PCL-C Reexperience	PCL-C Avoidance	PCL-C Hyperactivation	PCL-C Total	AAQ-II Total
Neurotic temperament	**.73*** **	-.29***	.42***	.52***	.51***	.54***	.66***
Positive temperament	-.47***	**.67*** **	-.18***	-.33***	-.22***	-.28***	-.38***
Depressed mood	.73***	-.47***	.41***	.64***	.52***	.59***	.74***
Autonomic arousal	.57***	-.26***	.55***	.58***	.60***	.64***	.62***
Somatic anxiety	.47***	-.12**	.44***	.47***	.53***	.53***	.52***
Intrusive cognitions	.60***	-.25***	.58***	.63***	.61***	**.67*** **	.72***
Social anxiety	.57***	-.53***	.29***	.44***	.40***	.43***	.51***
Traumatic re-experiencing	.58***	-.25***	.71***	.66***	.63***	**.73*** **	.68***
Avoidance	.51***	-.20***	.45***	.51***	.49***	.54***	**.59*** **

Note. NFFI = NEO–Five Factor Inventory, PCL-C = Posttraumatic Stress Disorder Checklist – Civilian Version, AAQ-II = Acceptance and Action Questionnaire-II – Psychological inflexibility.

** $p < .01$; *** $p < .001$

Known-Groups Validity

Regarding the known-groups validity a significant multivariate effect of the risk of an emotional disorder was observed, Pillai's Trace = .34, $F(9, 505) = 29.46$, $p < .001$, $\eta_p^2 = .34$. The subsequent univariate effects (see Table 6) showed significant differences in all domains of the MEDI. The results indicate that those individuals in higher risk of emotional disorders presented significantly higher scores in all dimensions of the MEDI, most notably in depressed mood and neurotic temperament.

Table 6. Comparison of the MEDI dimensions considering the BSI cut-off for the likelihood of an emotional disorder

	PSD < 1.7 (n = 352)	PSD ≥1.7 (n = 163)		
	M (SD)	*M (SD)*	$F(9, 505)$	η_p^2
Neurotic Temperament	13.96 (7.06)	22.50 (7.50)	156.34***	.23
Positive Temperament	29.45 (5.35)	26.85 (6.38)	23.09***	.04
Depressed mood	6.97 (5.83)	16.14 (9.33)	184.27***	.26
Autonomic arousal	4.23 (4.52)	10.99 (8.53)	137.82***	.21
Somatic anxiety	11.63 (6.31)	18.32 (8.19)	103.20***	.17
Intrusive cognitions	7.18 (7.14)	16.72 (11.10)	137.58***	.21
Social anxiety	10.01 (7.46)	17.28 (10.99)	77.32***	.13
Traumatic re-experiencing	5.22 (5.83)	12.71 (9.57)	119.72***	.19
Avoidance	18.00 (9.11)	27.06 (10.84)	97.32***	.16

Note. PSD = Positive Symptom Distress Index

*** $p < .001$

Discussion

The development and validation of the MEDI in Portugal provide us the first self-report instrument specifically developed to assess the dimensions included in Brown and Barlow's (2009) profile approach to the classification of emotional disorders in the country. The development and application of the European Portuguese version of the MEDI is an important contribution for research and practice in clinical psychology. Main findings of this study demonstrated the rather satisfactory reliability and validity of the MEDI and attest its use in Portugal. The reliability of the nine factors of the MEDI was generally very acceptable, with all Cronbach alphas above .70, as recommended (Nunnally, 1994) except for somatic anxiety, which was slightly below the .70 threshold (Cronbach's alpha = .69). Compared to the other study validations of this questionnaire, our results were very similar, except for the avoidance dimension, which in our validation reached an acceptable reliability (.73), and in the original (Rosellini & Brown, 2019) and Colombian (Guerrero, 2019) versions was below the recommended value of .70.

Regarding the descriptive statistics of the 49 items, it should be noted that there were no ceiling effects (percentages higher than 15%; Terwee et al., 2007), except for the item 19 and most items of the positive temperament dimension. However, and for several items, there were floor effects, that is, a significant proportion of participants answered in the lower anchor of the response scale. This evidence can be explained by the fact that the questionnaire was validated within a community sample and therefore less likely to have an emotional disorder than a clinical sample. As noted by Hyland (2003), floor and ceiling effects are population dependent. Therefore, these floor effects are not surprising. The ceiling effect found in item 19 ("worry about health") may be due to the fact that the validation took place during the year 2021, marked by the pandemic by the COVID-19 pandemic, which made people more aware and vulnerable about health issues.

Scale correlations between the dimensions assessed by the MEDI were of small-to-strong magnitude and largely consistent with prior research and the original validation study (Rosellini & Brown, 2019). Consistent with various studies (Brown et al., 1998; Watson et al., 1988), and as expected, the dimensions MEDI-Neurotic Temperament and Positive Temperament were inversely correlated. As also expected, between MEDI-Neurotic Temperament and all seven lower order phenotype dimensions there was a positive correlation, and between MEDI-Positive Temperament and all lower order dimensions there were negative correlations. This evidence is in agreement with the results of hierarchical structural models of traits and symptoms of emotional disorder (Brown et al., 1998; Rosellini & Brown, 2011) and replicates the pattern of associations of the original validation. It is also noteworthy that the pattern with the Neurotic Temperament dimension is more consistent with the seven lower dimensions than the Positive Temperament dimension, which is

less consistent. Of these associations, the correlation that was most evident was between MEDI-Positive Temperament and Depressed Mood (r = -.47), which is in line with the reported findings in the original and the Colombian validation studies ((Rosellini & Brown, 2019; Guerrero, 2019) as well as with the position of some authors, such as Brown et al. (1998), who stated that the low positive affect is a feature specific to depression and may act as a diathesis to mood disorders.

Supporting the convergent validity, all nine MEDI dimensions were strongly or moderately correlated with their convergent self-report measures (rs > .50). In brief, one of the strongest correlation was found between MEDI-Depressed Mood and BSI-Depression (r = .83), as expected, since both self-report measures assess exactly the same dimension with similar items (e.g., item 11 "I feel sad and blue" from MEDI and item 17 "feel sad" from BSI). Support was also obtained for the convergent validity of MEDI-Autonomic Arousal, in its correlation with BSI- Somatization and BSI-Anxiety. With both dimensions there was a significant and strong correlation of .74, possibly explained by the presence of items that assess the occurrence of physical symptoms. Regarding the dimensions focused on anxiety (MEDI-Somatic Anxiety and MEDI-Social Anxiety), these showed moderate correlations with anxiety measures (BSI-Anxiety and BSI Interpersonal Sensitivity, respectively); however, despite being significant, compared to the other convergent self-report measures, these are the correlations with the weakest magnitude (both r = .53). Therefore, future validation studies of the MEDI may benefit of the selection of more specific measures to correlate with MEDI-Social Anxiety, such as the Social Interaction Anxiety Scale (SIAS), which was developed to reliably assess the construct of social anxiety. Regarding the MEDI-Somatic Anxiety dimension, it is important to mention that also in the original study (Rosellini & Brown, 2019) there were difficulties in achieving a strong correlation. Particularly, in the original validation study, the authors correlated MEDI-Somatic Anxiety with the anxiety dimension of the Depression Anxiety Stress Scales (DASS) and obtained a correlation coefficient of .42. Thus, although our correlation between the MEDI-Somatic Anxiety and the BSI-Anxiety was not very strong (r =.53), it was strongest than in the original study.

Regarding the construct validity, it was possible to partially confirm in the CFA the proposed model of the MEDI. Although in our sample the model showed slightly lower results than the recommended in the literature (CFI > .95; RMSEA < .06; and SRMR < .08; Hu & Bentler, 1999), the CFA conducted at item-level provided very promising results pertaining the nine-factor structure proposed by Rosellini and Brown (2019). In our study, after correlating three pairs of errors, which were theoretical plausible, namely the item 27 ("I will do almost anything to get rid of unpleasant feelings") with the item 31 ("If something upsets me, I try very hard to not think about it."); the item 38 ("I pay close attention to my health because I am afraid of getting sick") with item 28 ("I am preoccupied by illnesses and diseases"); and the item 38 with the item 19 ("I worry about my health") the model increased, despite the CFI below .90. However, it is important

to point out that the remaining indexes were quite acceptable, particularly the lower RMSEA and the acceptable SRMR. In future studies, possibly with larger sample sizes and incorporating a clinical sample, these data should be replicated.

Within the scope of the known-groups validity, we examined whether the MEDI was able to discriminate between individuals at risk of emotional disorder and those who were not at risk. This evaluation was important because a community sample was used, with no clinical comparison group (e.g., patients with emotional disorders). The results obtained from the multivariate analysis of variance reinforced the discriminant ability of the MEDI, as it was possible to clearly distinguish between individuals with (PSD $\geq$ 1.7) and without (PSD < 1.7) a higher risk of emotional distress, reinforcing the conclusions of the validation of the BSI (Canavarro, 2007). Thus, we can confirm that it is indeed an extremely important instrument in the context of emotional problems.

Currently, the MEDI is the only self-reported instrument that effectively assesses the traits and phenotypes associated with the development, expression and maintenance of several emotional disorders. Regardless of whether or not there is interest in the transdiagnostic approach, the MEDI can bring added value to clinicians who are treating patients with emotional disorders (and in some cases with comorbid emotional disorders), as well as to researchers who are interested in the study of the nature and development of emotional disorders (Rosellini & Brown, 2019). The validation of this measure in Portugal is a relevant contribution to the field, and allows the dimensions of emotional disorders developed by Brown and Barlow (2009) to be assessed through a single measure, avoiding the need for participants to answer a long set of questionnaires. It should also be noted that the existing questionnaires were not specifically designed to assess the constructs under the transdiagnostic approach, although they can assess constructs that overlap with the dimensions covered by the MEDI (Rosellini & Brown, 2019). Our validation study has also made an essential contribution to the widespread of the MEDI, which until now, and to our knowledge, has only been validated in two countries (USA and Colombia). The fact that it was validated in Portugal helped to verify the universality of the transdiagnostic constructs in emotional disorders, proving that this measure can be used in several contexts, cultures and populations.

Despite the important contribution, there are several limitations in this study that should be noted. As well, further research is needed to expand and improve the MEDI, and particularly to extend the validation studies to other cultures, in order to see if its factor structure is replicable in other contexts and populations. The present study responds to one of the suggestions mentioned by Rosellini and Brown (2019), where it was proposed that a validation should be done with a significant sample of participants of the non-clinical community. However, despite an advantage, our sample is also a limitation. Therefore, more data is needed and a replication of this study in a clinical sample, particularly of patients with a diagnosis of an emotional disorder, would be of particular value. In the present study we did not assessed the instrument's test-retest reliability.

Therefore, in future studies it would be important to evaluate the temporal stability of the MEDI dimensions. Another limitation refers to the use of a convenience sample and the fact that the sample was recruited online. These factors may have contributed to the higher incidence of younger individuals, as well as individuals with higher qualifications and Internet access, which may introduce some biases that compromise the generalization of these results.

In conclusion, it can be verified that the European Portuguese validation study provides strong support for the MEDI. As well, the results of our study show that this instrument is promising in the efficient and valid assessment of nine dimensions and phenotypes of emotional disorders proposed by Brown and Barlow (2009). In addition to this efficient assessment, the MEDI also emerges as a useful tool for research in clinical settings as well as for more general clinical purposes. For example, the solid support of convergent validity also demonstrate that it is possible to use the MEDI to replace long (and several) questionnaires assessing the constructs covered by the MEDI. In addition, as noted by Rosellini and Brown (2019), it would bridge the difficulty that exists associated with the decisions that have to be made by mental health professionals to decide which self-report instruments to use, since a measure like the MEDI is able to assess a broad range of emotional disorder dimensions. Thus, the MEDI would bring important benefits to researchers, clinicians in mental health care and patients, by enhancing standardized outcomes and decreasing the amount of time spent on clinical assessments.

Referências

American Psychiatric Association. (2014). *Manual de Diagnóstico e Estatística das Perturbações Mentais* (5th ed.). Climepsi Editores.

Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). Guilford Press.

Barlow, D. H., Allen, L. B., & Choate, M. L. (2004). Toward a unified treatment for emotional disorders. *Behavior Therapy, 35*(2), 205–230. https://doi.org/10.1016/S0005-7894(04)80036-4

Barnett, J. H., Huang, J., Perlis, R. H., Young, M. M., Rosenbaum, J. F., Nierenberg, A. A., Smoller, J. W. (2011). Personality and bipolar disorder: Dissecting state and trait associations between mood and personality. *Psychological Medicine, 41*(8), 1593–1604. http://dx.doi.org/10.1017/S0033291710002333

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the revised Beck Depression Inventory–II*. Psychological Corporation.

Bernstein, A., Stickle, T. R., Zvolensky, M. J., Taylor, S., Abramowitz, J., & Stewart, S. (2010). Dimensional, categorical, or dimensional-categories: Testing the latent structure of anxiety sensitivity among adults using factor-mixture modeling. *Behavior Therapy*, *41*(4), 515–529. https://doi.org/10.1016/j.beth.2010.02.003

Boettcher, H., Correa, J., Cassiello-Robbins, C., Ametaj, A., Rosellini, A. J., Brown, T. A., Kennedy, K., Farchione, T. J., & Barlow, D. H. (2020). Dimensional assessment of emotional disorder outcomes in transdiagnostic treatment: A clinical case study. *Cognitive and Behavioral Practice*, *27*(4), 442-453. https://doi.org/10.1016/j.cbpra.2019.11.001

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary Psychometric Properties of the Acceptance and Action Questionnaire-II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, *42*, 676–688. http://dx.doi.org/10.1016/j.beth.2011.03.007.

Brewin, C. R., Gregory, J. D., Lipton, M., & Burgess, N. (2010). Intrusive images in psychological disorders: Characteristics, neural mechanisms, and treatment implications. *Psychological Review, 117*(1), 210–232. http://dx.doi.org/10.1037/a0018113

Broman-Fulks, J. J., Deacon, B. J., Olatunji, B. O., Bondy, C. L., Abramowitz, J. S., & Tolin, D. F. (2010). Categorical or dimensional: A reanalysis of the anxiety sensitivity construct. *Behavior Therapy, 41*(2), 154–171 https://doi.org/10.1016/j.beth.2009.02.005

Brown, T. A., & Barlow, D. H. (2005). Categorical versus dimensional classification of mental disorders in DSM–V and beyond. *Journal of Abnormal Psychology, 114*(4), 551–556. https://doi.org/10.1037/0021-843X.114.4.551

Brown, T. A., & Barlow, D. H. (2009). A proposal for a dimensional classification system based on the shared features of the DSM-IV anxiety and mood disorders: Implications for assessment and treatment. *Psychological Assessment, 21*(3), 256–271. https://doi.org/10.1037/a0016608

Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM–IV anxiety and mood disorders in a large clinical sample. *Journal of Abnormal Psychology, 110*(4), 585–599. http://dx.doi.org/10.1037/0021-843X.110.4.585

Brown, T. A., Chorpita, B. F., & Barlow, D. H. (1998). Structural relationships among dimensions of the DSM–IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology, 107*(2), 179–192. https://doi.org/10.1037//0021-843x.107.2.179

Brown, T. A., Di Nardo, P. A., Lehman, C. L., & Campbell, L. A. (2001). Reliability of DSM-IV anxiety and mood disorders: Implications for the classification of emotional disorders. *Journal of Abnormal Psychology, 110*(1), 49–58. http://dx.doi.org/10.1037/0021-843X.110.1.49

Canavarro, M. C. (2007). Inventário de Sintomas Psicopatológicos (BSI): Uma revisão crítica dos estudos realizados em Portugal. In M. R. Simões, C. Machado, M. M. Gonçalves, & L. S. Almeida (Coords.), *Avaliação Psicológica: Instrumentos validados para a população portuguesa* (pp. 305-331). Quarteto.

Carleton, R. N., Peluso, D. L., Collimore, K. C., & Asmundson, G. J. (2011). Social anxiety and posttraumatic stress symptoms: The impact of distressing social events. *Journal of Anxiety Disorders, 25*(1), 49–57. http://dx.doi.org/10.1016/j.janxdis.2010.08.002

Clark, L.A. (2005). Temperament as a unifying basis for personality and psychopathology. *Journal of Abnormal Psychology, 114*(4), 505–521. https://doi.org/10.1037/0021843X.114.4.505

Conselho Nacional de Saúde. *Sem mais tempo a perder – Saúde mental em Portugal: Um desafio para a próxima década.* Lisboa: CNS, 2019. http://www.cns.min-saude.pt/2019/12/16/sem-mais-tempo-a-perder-saude-mental-em-portugal-um-desafio-para-a-proxima-decada/

Costa, P. T., & McCrae, R. R. (1989). NEO five-factor inventory (NEO-FFI). *Odessa, FL: Psychological Assessment Resources, 3*.

Derogatis, L., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. *Psychological Medicine, 13*(3), 595-605. https://doi.org/10.1017/S0033291700048017

Gallagher, M. W. (2017). Transdiagnostic mechanisms of change and cognitive-behavioral treatments for PTSD. *Current Opinion in Psychology, 14*, 90–95. https://doi.org/10.1016/j.copsyc.2016.12.002

Guerrero, S. Z. (2019). *Effects of specific modules of the Unified Protocol in transdiagnostic processes of patients with emotional disorders.* [Unpublished doctoral dissertation]. Universidad De Los Andes Facultad De Ciencias Sociales Departamento De Psicología.

Hagenaars, M. A., van Minnen, A., Hoogduin, C. A., & Verbraak, M. (2009). A transdiagnostic comparison of trauma and panic memories in PTSD, panic disorder, and healthy controls. *Journal of Behavior Therapy and Experimental Psychiatry, 40*(3), 412–422. https://doi.org/10.1016/j.jbtep.2009.04.001

Hu L., Bentler P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hyland, M.E. (2003). A brief guide to the selection of quality of life instrument. *Health Qual Life Outcomes, 1*, 24. https://doi.org/10.1186/1477-7525-1-24

IHME. (2018). *Global Health Data Exchange*. www.healthdata.org/

Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D. S., Quinn, K., Sanislow, C., & Wang, P. (2010). Research domain criteria (RDoC): Toward a new classification framework for research on mental disorders. *The American Journal of Psychiatry*, *167*(7), 748–751. https://doi.org/10.1176/appi.ajp.2010.09091379

Insel, T. R. (April 29, 2013). *Transforming diagnosis. Director's Blog*. https://www.nimh.nih.gov/about/directors/thomas-insel/blog/2013/transforming-diagnosis.shtml

Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. J. (1992). Major depression and generalized anxiety disorder: Same genes, (partly) different environments? *Archives of General Psychiatry, 49*(9), 716-722. https://doi.org/10.1001/archpsyc.1992.01820090044008

Kessler, R. C., Chiu, W. T., Jin, R., Ruscio, A. M., Shear, K., & Walters, E. E. (2006). The epidemiology of panic attacks, panic disorder, and agoraphobia in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 63*(4), 415–424. https://doi.org/10.1001/archpsyc.63.4.415

Kliem, S., Beller, J., Kröger, C., Birowicz, T., Zenger, M., & Brähler, E. (2014). Dimensional latent structure of somatic symptom reporting in two representative population studies: Results from taxometric analyses. *Psychological Assessment, 26*(2), 484–492. https://doi.org/10.1037/a0035721

Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., Brown, T. A., Carpenter, W. T., Caspi, A., Clark, L. A., Eaton, N. R., Forbes, M. K., Forbush, K. T., Goldberg, D., Hasin, D., Hyman, S. E., Ivanova, M. Y., Lynam, D. R., Markon, K., Miller, J. D., … Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology, 126*(4), 454–477. https://doi.org/10.1037/abn0000258

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-u

Magalhães, E., Salgueira, A., Gonzalez, A. J., Costa, J. J., Costa, M. J., Costa, P., & Lima, M. P. D. (2014). NEO-FFI: Psychometric properties of a short personality inventory in Portuguese context. *Psicologia: Reflexão e Crítica, 27*(4), 642-657. https://doi.org/10.1590/1678-7153.201427405

Marcelino, D., & Gonçalves, S. P. (2012). Perturbação pós-stress traumático: Características psicométricas da versão portuguesa da Posttraumatic Stress Disorder Checklist–Civilian Version (PCL-C). *Revista Portuguesa de Saúde Pública, 30*(1), 71-75. https://doi.org/10.1016/j.rpsp.2012.03.003

McCrae, R. R., & Costa, P. T. (2004). A contemplated revision of the NEO Five-Factor Inventory. *Personality and Individual Differences, 36*(3), 587-596. https://doi.org/10.1016/s0191-8869(03)00118-1

Nunnally, J. C. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

O'Connor, L. E., Berry, J. W., Weiss, J., & Gilbert, P. (2002). Guilt, fear, submission, and empathy in depression. *Journal of Affective Disorders, 71*(1-3), 19–27. https://doi.org/10.1016/s0165-0327(01)00408-6

OECD/EU (2018). *Health at a Glance: Europe 2018: State of Health in the EU Cycle*. OECD Publishing, Paris. https://doi.org/10.1787/health_glance_eur-2018-en

Olatunji, B. O., Broman-Fulks, J. J., Bergman, S. M., Green, B. A., & Zlomke, K. R. (2010). A taxometric investigation of the latent structure of worry: dimensionality and associations with depression, anxiety, and stress. *Behavior Therapy, 41*(2), 212–228. https://doi.org/10.1016/j.beth.2009.03.001

Pinto-Gouveia, J., Gregório, S., Dinis, A., & Xavier, A. (2012). Experiential avoidance in clinical and non-clinical samples: AAQ-II Portuguese version. *International Journal of Psychology and Psychological Therapy, 12*(2), 139-156.

Rapee, R. M., Sanderson, W. C., & Barlow, D. H. (1988). Social phobia features across the DSM–III–R anxiety disorders. *Journal of Psychopathology and Behavioral Assessment, 10*(3), 287–299. https://doi.org/10.1007/BF00962552

Rosellini, A. J., Boettcher, H., Brown, T. A., & Barlow, D. H. (2015). A transdiagnostic temperament-phenotype profile approach to emotional disorder classification: An update. *Journal of Experimental Psychopathology*, *2*(1), 110–128. https://doi.org/10.5127/pr.036014

Rosellini, A. J., & Brown, T. A. (2011). The NEO Five-Factor Inventory: Latent structure and relationships with dimensions of anxiety and depressive disorders in a large clinical sample. *Assessment, 18*(1), 27–38. http://dx.doi.org/10.1177/1073191110382848

Rosellini, A. J., & Brown, T. A. (2019). The Multidimensional Emotional Disorder Inventory (MEDI): Assessing transdiagnostic dimensions to validate a profile approach to emotional disorder classification. *Psychological Assessment, 31*(1), 59–72. https://doi.org/10.1037/pas0000649

Tallis, F. (1999). Unintended thoughts and images. In T. Dalgleish & M. J. Power (Eds.), *Handbook of cognition and emotion* (pp. 281-300). John Wiley & Sons. https://doi.org/10.1002/0470013494.ch15

Tennant, A., & Conaghan, P. G. (2007). The Rasch measurement model in rheumatology: What is it and why use it? When should it be applied, and what should one look for in a Rasch paper? *Arthritis & Rheumatism, 57*(8), 1358–1362. https://doi.org/10. 1002/art.23108

Terwee, C. B., Bot, S. D., de Boer, M. R., van der Windt, D. A., Knol, D. L., Dekker, J., & de Vet, H. C. (2007). Quality criteria were proposed for measurement properties of health status questionnaires. *Journal of Clinical Epidemiology*, *60*(1), 34–42. https://doi.org/10.1016/j.jclinepi.2006.03.012.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070. http://dx.doi.org/10.1037/0022-3514.54.6.1063

Weathers, F.W., Huska, J.A., Keane, T.M. (1991). PCL-C for DSM-IV. *National Center for PTSD – Behavioral Science Division.* Boston.

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with non-normal variables: Problems and remedies. In R. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56–75). Sage.