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Psychologica constitui um espaço de partilha de ideias, problemas e experiências, nos diversos domínios da Psicologia. A difusão do conhecimento produzido e reflectido por investigadores nacionais e estrangeiros é nesta revista assumida como um importante estímulo para novas investigações, bem como para a configuração e problematização de diferentes intervenções psicológicas.

Psychologica aims to disseminate national and international scientific work carried out in the various areas of Psychology. It equally intends to be a place for the exchange of ideas, problems, and experiences, stemming from the theory and practice of human, social and cultural development.

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PSYCHOLOGICA

ÍNDICE / INDEX

(Página deixada propositadamente em branco)

Editorial • pág. 7-11
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Editorial
Cognitive behaviour therapy across the life span

Maria do Céu Salvador[1] and Marco Pereira[2]

Mental disorders both in adults as well as in children and adolescents are highly prevalent (e.g., Merikangas et al., 2010; The WHO World Mental Health Survey Consortium, 2004). Cognitive-behavioural therapy (CBT) is recommended as first-line treatment in an array of emotional and behaviour disorders, due to its vast empirical support (e.g., National Institute for Health and Care Excellence [NICE], 2020; Tollin, 2010; Walter et al., 2020). More recent third-wave approaches, namely Acceptance and Commitment Therapy (ACT), are also showing their effectiveness across disorders and age ranges (Fang & Ding, 2020; Gloster et al., 2020). Nevertheless, like every other scientific discipline, CBT is in constant evolution, awaiting new and innovative developments. Humans are so complex, and suffering in its multiple shapes is so prevalent that there is always room to develop new theories, to refine already existent theories, to improve practices and to increase dissemination.

In this special issue of the journal *Psychologica*, several researchers and clinicians made valuable contributions, aiming at different populations (children, adolescents and adults), different phases of the life course (preschool, secondary school, expecting a first child), different approaches of CBT (second or third wave therapies), and different levels of action (developing assessment instruments, refining conceptualizations, building programs, developing new delivery formats, and disseminating knowledge). Let us give you a short-guided tour through the headlines of this special issue.

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Starting with children and adolescents, two papers contribute to our knowledge on two different conditions: behavioural inhibition and test anxiety. Taking into account that behavioural inhibition is seen as a behavioural marker of a biological vulnerability to develop anxiety disorders, its early detection is crucial. Given that most research examining socioemotional and behavioural characteristics of behaviourally inhibited children come from mothers, the study of Lourdes Espinosa-Fernández and colleagues aimed to fill this gap, using a multi-informant approach where mothers, fathers and teachers of preschool children completed the same assessment instruments. Results demonstrated that children classified as behaviourally inhibited showed lower levels of socioemotional and behavioural adjustment, when compared with uninhibited peers, and that shyness was the variable more strongly associated with behaviour inhibition, regardless of the context or informant. This study provides a more comprehensive overview of behaviourally inhibited children in different contexts.

The second paper, by David Putwain and Wendy Symes, fills another important gap. Despite the fact that test anxiety is highly prevalent and interfering among adolescents, literature on this topic is seldom found compared to other psychological conditions. In their paper, Putwain and Symes reviewed and discussed several topical points: the concept of test anxiety and its importance; the Self-Regulatory Executive Function Processing Model (S-REF) to understand it; and test anxiety interventions for adolescents, focusing on the program Tackle Exam Pressure and Stress (STEPS) as an effective therapeutic intervention for secondary students. This is an important paper on what test anxiety is, why it is important, how to understand it, and how to cope with it.

Still focusing on younger populations, the following two papers support the advantages of transdiagnostic approaches for adolescents with internalizing and externalizing disorders, considering that these disorders are frequently comorbid, and that they may have common risk factors and underlying processes.

First, Sharon Allan and colleagues examined the efficacy of the Super Skills for Life – adolescent version (SSL-A), a transdiagnostic prevention program, in a sample of adolescents with internalizing and/or externalizing problems, in two types of school settings. Results showed that the SSL-A was effective in reducing internalizing and externalizing problems, and that males, younger adolescents and being in a mainstream school had significantly higher reductions. This is the first study to have used the SSL transdiagnostic prevention program in one mainstream school and one pupil referral unit, and to have focused on internalizing and externalizing problems. In another paper, Jose Piqueras and Daniel Rama-Victor reviewed the literature on neuropsychological characteristics and deficits in internalizing and externalizing disorders in children and adolescents, as well as the evidence favouring neuropsychological-based strategies

that may target these deficits. The authors propose an integrative neuropsychological and transdiagnostic perspective, defending that the effectiveness of empirically-supported CBT for children and adolescents may be improved with the inclusion of neuropsychological or neurocognitive strategies. Considering current knowledge of the brain, this is an innovative proposal to improve children and adolescents' mental health and well-being.

The three following articles target a specific population: adults on the process of becoming parents. Becoming a parent is a stressful experience for the individual but also for the couple as a unit (i.e., is a context of dyadic stress), therefore pointing to the importance of interrelated and reciprocal coping strategies, which is commonly termed as dyadic coping. In line with this rationale, Marco Pereira and colleagues' study explored and confirmed the mediating role of dyadic coping in the relationship between internalizing symptoms and dyadic adjustment in parents expecting their first child. Additionally, this mediation was found within person and across partners and both for women and men, indicating that both members of the couple experience considerable psychological distress in this phase of life course. These findings suggest that effective prevention should assess the couple's emotional state and coping resources, and that both partners may benefit from dyadic-coping-enhancing CBT-based programs that help them respond sensitively to their partners' psychological distress, therefore contributing to more positive marital adjustment.

In the following paper, Ana Fonseca and colleagues discuss how e-mental health tools, namely web-based interventions, based on CBT principles can be an effective and useful option to face-to-face interventions to increase population's access to mental health services. To illustrate such a program, the authors provide the example of the *Be a Mom*, a program developed by the authors and designed to prevent postpartum depression that integrates second and third-wave constructs. This innovative format of treatment delivery may contribute to increase the accessibility of CBT interventions.

The third paper on this topic is a psychometric study. Although mindful parenting research is growing in samples of school aged children and adolescents, the research on mindful parenting during the postpartum period is scarce, and includes the lack of adequate measures for assessing this construct in this period. Brígida Caiado and colleagues aimed at filling this gap by studying the factor structure and the psychometric properties of an adapted version of the Interpersonal Mindfulness in Parenting scale for parents of infants up to 12 months old (the IM-P-I). Results showed that the IM-P-I is a psychometrically sound measure of mindful parenting in the postpartum period. The existence of a validated assessment instrument with this specific population will promote the development of this field of study.

The last paper of this special issue is related to the importance of disseminating current knowledge, namely, knowledge on CBT for sleep disorders. Given the high prevalence of sleep disorders and the recognized efficacy of cognitive behavioural interventions in sleep problems, disseminating knowledge on these interventions amongst professionals is of surmount importance. In line with this, the paper by Ana Allen Gomes, further expanded from a presentation in the congress of the World Sleep Society, summarizes the syllabus of the recent course unit Psychological Interventions on Sleep Disorders, introduced in the master degree in clinical psychology, and analyses the students' perceptions regarding this course unit in its three first editions, concluding that the students' evaluations of the course were rather promising. Other course units could also be organized to deepen future professional's knowledge on other CBT related fields of study.

As stated before, CBT is dynamic and ever learning. The advantages of CBT are countless. The existence of psychometrically sound assessment instruments opens the way to new fields of knowledge. Greater knowledge on the aetiology of psychological disorders will allow an early detection of vulnerability factors, and timely prevention and intervention. Understanding maintenance factors will inform theories and contribute to the development of effective therapeutic strategies. Uncovering shared processes will lead to transdiagnostic models and programs. Access to effective interventions may rely on innovative formats of delivery. Dissemination of knowledge amongst professional needs to be insured. Touching all these subjects, this special issue represents our modest contribution to the vast CBT field, disseminating the research with which our authors kindly collaborated. More awaits to be unravelled and shared. That is the only way to do science.

Our profound acknowledgement to all our authors. Our sincere hope that our readers will learn as much as we did. And our deep desire that many other authors across the world may join us in the future.

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Understanding children with behavioral inhibition:
Multi-informant approach in educational and family contexts • pág. 13-29
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Understanding children with behavioral inhibition: Multi-informant approach in educational and family contexts

Lourdes Espinosa-Fernández[1], LuisJoaquin García-López[2], José Antonio Muela Martínez[3], and Alfonso Ordóñez-Ortega[4]

Abstract

Behavioral inhibition is a temperament trait characterized by extreme fear in the face of novelty. Behavioral inhibition has been associated with the development of mental disorders. However, there is a lack of research examining the socioemotional and behavioral characteristics of behaviorally inhibited children both in family and school settings. For a more comprehensive and in-depth overview of children's behavior in each of these contexts, this study has collected data from both parents (mother and father-family setting) and from teachers (educational environment). The sample consisted of 109 children aged between 4 and 6 years old. Multi-informant approach was used: all fathers, mothers and teachers completed both the Preschool Behavioral Inhibition Scales, the Child Behavior Checklist (CBCL) for parents and teachers, and the Behavior Assessment System for Children and Adolescents (BASC). Our findings revealed that children classified as behavioral inhibition exhibit less socioemotional and behavioral adjustments than their uninhibited peers both in family and school contexts. Further, the shyness variable seemed to be strongly associated with behavioral inhibition, regardless of informant and context.

Keywords: behavioral inhibition, childhood, informant, shyness, socioemotional.

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Compreender crianças com inibição emocional: Uma abordagem com múltiplos informadores do contexto educacional e familiar

Resumo

A inibição comportamental é um traço de temperamento caracterizado por medo extremo face a situações novas. A inibição comportamental tem sido associada ao desenvolvimento de perturbações mentais. No entanto, é escassa a investigação que examina as características socio-emocionais e comportamentais de crianças com inibição comportamental em contextos educacionais e familiares. Para uma visão global mais compreensiva e aprofundada do comportamento da criança em cada um destes contextos, este estudo recolheu dados com os pais (mãe e pai – contexto familiar) e com os professores (contexto educacional). A amostra foi constituída por 109 crianças, entre os 4 e os 6 anos de idade. Foi utilizada uma abordagem com múltiplos informadores: todos os pais, mães e professores completaram as Escalas de Inibição Comportamental para o Pré-Escolar, o Questionário de Comportamento da Criança para pais e professores (CBCL e CTRF) e o Sistema de Avaliação do Comportamento para Crianças e Adolescentes (BASC). Os resultados revelaram que crianças consideradas com inibição comportamental apresentavam níveis mais baixos de ajustamento socio-emocional e comportamental comparativamente a crianças não inibidas, tanto no contexto familiar como no contexto educacional. Adicionalmente, a variável de timidez pareceu ser a que mais fortemente se associou à inibição comportamental, independentemente do informador e do contexto.

Palavras-chave: inibição comportamental, infância, informadores, timidez, socio-emocional

INTRODUCTION

Behavioral Inhibition (BI) is a temperament trait characterized by the tendency to react with extreme shyness and withdrawal to novel objects, unknown situations, and unfamiliar people (Fox et al., 2005; Kagan et al., 1987; Vreeke et al., 2012). Like other temperament variables, BI boasts a relatively consistent, basic disposition which is biologically based and sensitive to the influence of contextual variables (Goldsmith et al., 1987; Kagan et al., 1998). Data suggest that approximately 15% of children are extremely inhibited and respond with fear and withdrawal behavior to unknown places, people and objects (Kagan, 1997). Similarly, this research team reports that close to 10% of children who exhibit BI at preschool continue to do so into childhood, adolescence and adulthood (Kagan & Snidman, 2004).

Further, girls tend to show higher, more stable levels of BI than boys (Essex et al., 2010; Keer et al., 1994).

The relationship between BI and mental disorders has been consistently found (Van Brakel & Muris, 2006). For instance, studies link BI to anxiety disorders (Claus & Blackford, 2012; Chronis-Tuscano et al., 2009; Essex et al., 2010; Hirshfeld-Becker et al., 2007; Hudson et al., 2011; Muris et al., 2011; Ordóñez-Ortega et al., 2013; Orgiles et al., 2012; Papachristou et al., 2018; Paulus et al., 2015; Rapee, 2014). Hence, when dealing with children who remain inhibited in a steady fashion over time (Hirshfeld-Becker et al., 1992), BI is seen as a behavioral marker of biological vulnerability in the development of anxiety disorders (Biederman et al., 2001; Kagan et al., 1988). However, given that not all anxious children show inhibited behavior and not all children with BI suffer from pathologies related to anxiety, it is deemed necessary to identify what other factors may play a role in the origin, development and maintenance of the relationship between BI and anxiety disorders (Rapee, 2014). Thus, it should be noted that just as there are variables that may favor the presence of BI and the development of anxiety disorders in children, there is a consensus to consider other factors that adopt a protective approach in the development of childhood anxiety, ranging from external, familial and socioenvironmental variables to those of an internal, genetic and cognitive nature (Degnan et al., 2010; Donovan & Spence, 2000). It is known that these risk and protective factors interact with one another and, depending on variables such as characteristics of context, an individual's vulnerability and the developmental stage, may or may not be the result of the development of inhibition and anxiety problems in children (Espinosa-Fernández, 2009). For these reasons, some authors see the need for new research which examines the additive and interactive effects of BI as well as a wide range of other vulnerability factors in the development of pathological anxiety in youths (Hirshfeld-Becker, Micco, et al., 2008; Hirshfeld-Becker, Micco, Simoes, & Henin, 2008).

In relation to those contexts where BI is present, some investigations suggest that attending school is particularly stressful for inhibited children (Coplan & Arbeau, 2008; Evans, 2001), which means that they become less involved in social activities (Kochanska, 1998) and may find it difficult to adapt in the long term. Given the advantages that early detection of BI can have on children, and bearing in mind that it is sensitive to the influence of contextual variables, preschool has been proposed as the crucial age to assess this construct (Goldsmith et al., 1987; Ordoñez et al., 2013). However, early detection of BI in children during preschool years has been mostly supported by information provided by either mothers or teachers (Amador et al., 2006).

To cover this gap, the aim of this study was to explore the existence of variables associated with BI in children aged between four and six years by collecting data

from multiple informants both in family (both father and mother) and school settings (teachers) by the very first time. It is hypothesized that BI children will exhibit less socioemotional and behavioral adjustment, regardless of informants and contexts.

METHOD

Participants

The participants were 109 children aged between four and six years, enrolled in two preschool centers located in Jaen, Spain. The mean age was 4 years and 10 months (*SD* = 0.60). There was gender balance: 41.3% (*n* = 45) children were boys and 58.7% (*n* = 64) girls. Further, 59.6% (*n* = 65) attended public and 40.4% (*n* = 44) private schools. The socioeconomic status of this sample of children was middle (Hollingshead, 1975). In terms of the study's data collection, both the fathers and mothers and teachers served as informants. Most of informants in the family context were the children's biological parents (95%), followed by foster parents (5%). Among them, 1% were under 25 years of age, 30.3% between 26 and 35 years, 66% between 36 and 45, and 2.7% between 46 and 55. Regarding ethnicity, 98% of the parents were Spanish citizens compared to 2% from other countries. As for the teachers, 16 preschool educators (100% females) enrolled in the study.

Measures

Preschool Behavioral Inhibition Scale - Teacher's form (*Escala de Inhibición Conductual para Preescolares - Versión Maestros,* EICP-M), by Sola et al. (2003) and the Parents' form, EICP-P, an adaptation of the teacher's version for the purpose of this study. The EICP was designed to evaluate the BI variable in a child compared to other children (items 1 through 9) and in the playground or the park (items 10 through 14). The short version used in this study comprises 14 items with four answer alternatives (never, sometimes, almost always, always). It can be used on fathers, mothers and teachers, either individually or in groups, to assess children aged between 3 and 6 years, taking approximately five minutes to complete. The internal consistency of the EICP-M was good, with a Cronbach's alpha of .86 across the entire scale. The reliability rating for the EICP-P scale was α = .85 in the fathers'

sample and α = .85 in the mothers' sample. The convergent validity of the EICP-M was measured by correlating the scale's total score with the total scores obtained from other inhibition measures and different indices of psychopathy. Positive yet more modest correlations with inhibition measures derived from the fathers' and mothers' scores were also found. The discriminant validity of the EICP-M was assessed by calculating the correlation found between this scale's scores and those obtained from different indices of externalizing symptomatology, whose values were virtually non-existent or not significant.

Child Behavior Checklist - for Parents, CBCL, and for Teachers-Caregivers, CTRF, by Achenbach and Rescorla (2000). This inventory evaluates a wide range of children's adaptive behaviors and problems, covering three groups of disorders: *externalizing disorders* (attention problems and aggressive behavior); *internalizing disorders* (emotional reactivity, anxiety/depression, somatic complaints and shyness); and *mixed type problems* (encompassing other problems and sleep problems); plus, *total problems*, which is a sum of the externalizing, internalizing and mixed type problems. It comprises 99 items with three answer alternatives (not true, somewhat or sometimes true, very true or often true). It can be used on fathers, mothers and teachers, either individually or in groups, to assess children aged between one and a half and six years, taking between 10 and 20 minutes to complete depending on the age-appropriate level. The CTRF boasts the same dimensions as the CBCL, with the exception of sleep problems.

Behavior Assessment System for Children and Adolescents - Parents' form, BASC-P1, and Teacher's form, BASC-T1, by Reynolds and Kamphaus (2004). The BASC allows to evaluate the adaptive and maladaptive aspects of behavior in children and adolescents in a family and school setting as well as a clinical one. Each instrument includes an assessment of the *clinical scales or negative aspects* (aggressiveness, hyperactivity, attention problems, atypicality, depression, anxiety, shyness, somatization), the *adaptive scales or positive aspects* (adaptability, social skills), as well as the global dimensions of *externalizing problems* (aggressiveness and hyperactivity), *internalizing problems* (depression, anxiety and somatization) and *adaptive skills* (adaptability and social skills). It also measures, among other indices, the *Behavioral Symptoms Index*, which is the sum of aggressiveness, hyperactivity, attention problems, atypicality, depression and anxiety. It comprises 130 items with four answer alternatives (never, sometimes, frequently, almost always). At this level, it takes between 10 and 20 minutes to complete, and can be used on fathers, mothers and teachers, either individually or in groups, to assess children aged between three and six years. The BASC-T1 questionnaire boasts the same characteristics as the parents' version, although it only has 106 items.

Procedure

The participants were recruited from two public and private schools, between-school random assignment from the educative census. Before collecting data, approval of Ethical School Board and University Committees was required. The families were then informed of the study's objectives via letter and at a meeting held in the participating schools. The schools' directors explained the research aims to the teaching staff to enhance their involvement. Parents and teachers were asked to give written informed consent. In order to facilitate the implementation of the study and to guarantee the families' anonymity, once questionnaires were filled in, both parents and teachers sent them back to researchers in a sealed envelope by a set time. The measures were counterbalanced to avoid order effects; and the test pack included a contact telephone number and email address in case of any doubts by parents and/or teachers. The participation rate was 89% for parents (both father and mother) and 100% for teachers. Children were identified as behaviorally inhibited should they score higher than recommended normative data on the EICP-M and EICP-P questionnaires, filled in by the teachers and parents, respectively.

Data analyses

Statistical analysis was carried out using SPSS 22.0 for Windows. The significance level was set at $p < .05$ across all conducted statistical tests. A comparison of means (or medians) for independent samples using the Student's t-test and the Mann-Whitney U test was performed (in order to analyse the differences between children with and without BI for the different assessed variables). In addition, effect size (ES) in the comparison of means was examined, adopting the criteria proposed by Cohen (1988). Findings will be displayed for each informant and taking into account children's gender.

RESULTS

Table 1 presents with socioemotional and behavioral adjustments for the whole sample of children with or without BI based on each informant. For a clearer picture, only statistically differences with at least moderate effect sizes ($d > 0.50$) will be further examined. As it may be seen, consensus among all informants (teachers, fathers and mothers) was limited to shyness. Thus, any informant expressed that

shyness was the best variable to differentiate between behaviorally and unbehaviorally inhibited children, regardless of context (educational and family). There was an agreement in the family context: BI children scored significantly lower in hyperactivity, adaptability, social and adaptive skills, all measured by BASC. However, teachers expressed that BI children evidenced significantly higher levels of anxiety/depression symptomatology, somatic complains, other problems and internalizing disorders all measured by C-TRF. No consensus between teachers and fathers or mothers in any variable found to be significant was revealed.

Table 1

T-test for the variables evaluated by C-BCL (C-TRF) and BASC among children (without differentiating by sex) with behavioral inhibition (n = 37) and without behavioral inhibition (n = 72) in each of the three informants

		Father				Mother				Teacher			
	Variables	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A
C-BCL and C-TRF	Emotional reactivity	**-2.08***	2.92 (2.60)	1.90 (1.96)	0.52	-0.30	2.81 (2.87)	2.65 (2.42)		-1.24	1.84 (2.55)	1.32 (1.76)	
	Anxiety/ depression	-1.86	3.57 (2.26)	2.71 (2.23)		0.99	3.78 (2.49)	3.13 (2.31)		**-3.47****	3.70 (3.50)	1.51 (2.14)	0.81
	Somatic complaints	**-2.11***	2.95 (1.97)	2.14 (1.84)	0.44	1.19	2.05 (2.04)	2.60 (2.36)		**-2.69****	1.68 (2.36)	.58 (1.31)	0.63
	Shyness	**-4.66****	3.22 (2.32)	1.25 (1.51)	1.10	**-3.21****	2.54 (2.07)	1.32 (1.42)	0.73	**-3.69****	3.95 (4.15)	1.26 (2.13)	0.90
	Attention problems	0.43	2.35 (2.01)	2.51 (1.79)		0.92	2.16 (2.02)	2.51 (1.81)		0.50	2.97 (2.97)	3.29 (3.22)	
	Aggressive behavior	0.13	8.19 (5.55)	8.33 (5.48)		0.46	8.59 (5.96)	9.13 (5.40)		0.06	5.32 (5.44)	5.40 (6.55)	
	Sleep problems	-0.11	2.70 (2.17)	2.65 (2.38)		0.58	2.84 (2.20)	3.15 (2.84)		-	-	-	
	Other problems	-2.39**	9.62 (5.94)	6.99 (4.27)	0.48	-1.16	9.05 (5.33)	7.81 (4.92)		**-2.54***	8.24 (6.68)	5.21 (5.44)	0.51
	Internalizing disorders	**-3.38****	12.59 (7.38)	7.89 (5.72)	0.80	-1.08	11.19 (7.67)	9.61 (6.91)		**-3.46****	11.16 (1.47)	4.68 (6.20)	0.83
	Externalizing disorders	-0.01	1.81 (6.99)	1.79 (6.52)		0.63	1.76 (7.51)	11.65 (6.63)		0.22	8.30 (7.57)	8.69 (9.22)	
	Mixed type problems	-1.64	12.32 (7.37)	9.90 (7.07)		-0.66	11.89 (6.64)	1.96 (7.02)					
	Total problems	**-2.04***	35.78 (2.62)	28.39 (16.30)	0.41	-0.34	33.59 (2.35)	32.26 (18.77)		**-2.24***	27.70 (22.67)	18.58 (18.62)	0.45

Table 1

T-test for the variables evaluated by C-BCL (C-TRF) and BASC among children (without differentiating by sex) with behavioral inhibition (n = 37) and without behavioral inhibition (n = 72) in each of the three informants (cont.)

		Father				Mother				Teacher			
	Variables	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A
BASC	Aggressiveness	1.09	5.03 (3.01)	5.74 (3.59)		1.57	5.59 (3.6)	6.78 (3.76)		0.15	4.92 (5.37)	5.07 (4.42)	
	Hyperactivity	**2.48***	13.92 (6.14)	17.01 (3.59)	0.50	**2.57***	15.11 (6.42)	18.92 (7.72)	0.52	**2.13***	4.68 (5.54)	7.11 (5.66)	0.43
	Attention problems	-0.04	6.84 (3.73)	6.81 (3.12)		1.09	6.09 (3.93)	6.92 (3.67)		-1.21	6.16 (4.97)	5.10 (3.95)	
	Atypicality	-1.69	2.59 (2.44)	1.81 (2.23)		0.92	1.78 (2.04)	2.18 (2.17)		-1.61	3.65 (3.52)	2.53 (3.37)	
	Depression	-0.71	6.73 (4.29)	6.16 (3.84)		-0.19	7 (4.64)	6.83 (3.91)		**-2.06***	4.68 (4.47)	3.19 (2.96)	0.42
	Anxiety	0.28	5.92 (2.72)	6.08 (2.98)		1.66	5.84 (3.61)	7 (3.37)		-0.09	2.43 (2.42)	2.39 (2.38)	
	Shyness	**-4.91****	11.65 (5.20)	6.94 (3.64)	1.11	**-4.21****	11.68 (5.76)	7.32 (4.75)	0.85	**-7.05****	7.89 (5.32)	2.47 (2.71)	1.42
	Somatization	**-2.49***	6.7 (3.55)	5.07 (3.06)	0.50	-0.87	6.19 (4.06)	5.57 (3.19)		**-2.26***	5.51 (5.68)	1.68 (2.7)	0.46
	Adaptability	**4.06****	2.81 (3.57)	23.89 (3.82)	0.82	**4.21****	21 (3.82)	24.14 (3.63)	0.85	1.69	16.32 (3.53)	17.47 (3.26)	
	Social skills	**3.85****	24.54 (6.58)	29.13 (5.49)	0.78	**3.94****	26.24 (5.47)	3.67 (5.58)	0.79	1.25	14.08 (6.14)	15.75 (6.75)	
	Externalizing problems	1.79	81.78 (14.89)	87.22 (14.97)		**2.36***	84.34 (15.36)	92.28 (17.49)	0.48	1.27	9.78 (16.93)	94.94 (15.64)	
	Internalizing problems	-1.29	136.7 (23.86)	13.11 (25.9)		0.31	135.86 (27.77)	137.47 (23.34)		**-2.08***	149.57 (34.73)	138.71 (19.61)	0.42
	Adaptative skills	**4.18****	86.41 (19.82)	102.43 (18.44)	0.84	**4.92****	88.76 (17.21)	106.17 (17.63)	0.99	1.56	99.11 (17.51)	104.74 (17.92)	

X_{BI} = Mean of the group of children with Behavioral Inhibition
X_{NBI} = Mean of the group of children without Behavioral Inhibition
SD = Standard deviation
d^A = Value of the effect size (*d*) of Student's t according to Cohen's (1988)
* The Student t-test is significant at .05 level (bilateral)
** The Student t-test is significant at .01 level (bilateral)

For a more comprehensive and in-depth overview, Tables 2 and 3 display data from boys and girls, respectively. As far as boys are concerned (see Table 2), all informants (teachers, fathers and mothers) agreed on the role of shyness to statistically differentiate between BI and no-BI children. However, a unique pattern was revealed for boys: fathers and mothers agreed that BI children exhibited significantly higher levels of anxiety/depression symptomatology as measured by C-BCL. However, consistently with the whole sample, BI boys differed on the adaptability, social and adaptive skills based on both parents. On contrary, teachers expressed that BI boys evidenced significantly higher levels only of somatic complains. Unlike

the whole sample, there was consensus between teachers and fathers on internalizing disorders to differentiate between BI and no-BI boys based on C-BCL but not on BASC. Only fathers found emotional reactivity, internalizing disorders, other and mixed type problems (according to C-BCL), and atypicality, depression, and internalizing disorders (based on BASC) could differentiate BI and no-BI boys. In sum, informants revealed a wider and more diffuse number of variables for BI boys.

Table 2

T test for the variables evaluated by C-BCL (C-TRF) and BASC among boys with behavioral inhibition (n = 15) and without behavioral inhibition (n = 30) in each of the three informants

		Father				Mother				Teacher			
	Variables	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A
C-BCL and C-TRF	Emotional reactivity	**-2.64***	3.80 (3.02)	1.60 (1.61)	1.00	-0.98	3.87 (3.09)	2.90 (2.65)		.345	1.47 (1.59)	1.67 (1.76)	
	Anxiety/ depression	**-3.08****	4.73 (2.52)	2.47 (2.22)	0.96	**-2.15***	4.87 (2.99)	3.13 (2.28)	0.67	-1.63	2.67 (2.58)	1.53 (1.97)	
	Somatic complaints	-1.55	3.27 (1.9)	2.27 (2.1)		1.13	1.93 (1.98)	2.8 (2.59)		**-2.44***	1.2 (1.2)	0.37 (.765)	0.88
	Shyness	**-4.26****	4.13 (2.64)	1.07 (1.25)	1.65	**-2.11***	3 (2.39)	1.57 (1.52)	0.76	**-2.81****	4 (3.64)	1.57 (2.16)	0.87
	Attention problems	-0.05	2.87 (2.23)	2.83 (1.57)		0.50	2.67 (2.35)	3 (1.94)		0.96	3.07 (2.79)	4.1 (3.65)	
	Aggressive behavior	-1.48	1.33 (5.66)	7.93 (4.82)		-0.76	1.53 (7.22)	9.1 (5.21)		0.43	5.4 (5.16)	6.2 (6.03)	
	Sleep problems	-1.27	3.27 (2.24)	2.4 (2.02)		0.44	3 (2.64)	3.4 (2.9)			-	-	
	Other problems	**-2.88****	11.93 (6.82)	6.4 (4.13)	1.05	-1.39	1.67 (6.49)	8.17 (5.25)		-0.43	7.13 (5.5)	6.37 (5.54)	
	Internalizing disorders	**-3.93****	15.93 (7.63)	7.4 (4.99)	1.40	-1.28	13.67 (1.04)	1.3 (7.29)		**-2.15***	9.33 (7.55)	5.13 (5.36)	0.67
	Externalizing disorders	-1.55	13.87 (6.68)	1.8 (6)		-0.44	13.2 (9.26)	12.13 (6.67)		0.69	8.47 (6.83)	1.3 (9.06)	
	Mixed type problems	**-2.03***	15.2 (8.68)	9.78 (8.24)	0.63	-0.87	13.67 (8.26)	11.57 (7.22)		-0.55	24.93 (17.67)	21.8 (17.82)	
	Total problems	**-3.28****	45 (22.12)	27.2 (14.14)	1.02	-0.93	4.53 (26.5)	34 (19.59)		-	-	-	

Table 2

T test for the variables evaluated by C-BCL (C-TRF) and BASC among boys with behavioral inhibition (n = 15) and without behavioral inhibition (n = 30) in each of the three informants (cont.)

		Father				Mother				Teacher			
	Variables	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A
BASC	Aggressiveness	-0.92	6.07 (3.12)	5.1 (3.36)		0.31	6.53 (3.54)	6.9 (3.71)		-0.41	5.87 (5.41)	5.23 (4.55)	
	Hyperactivity	-0.00	17.8 (6.78)	17.8 (6.27)		0.98	18.07 (7.16)	2.53 (8.2)		1.66	5.67 (4.51)	8.47 (5.66)	
	Attention problems	-0.67	8.13 (4.5)	7.37 (3.04)		1.03	7 (4.45)	8.4 (4.21)		-0.28	6.6 (5.11)	6.2 (3.96)	
	Atypicality	**-2.31***	3.8 (2.67)	1.9 (2.55)	0.72	1.23	2.67 (2.44)	2.77 (2.63)		-1.87	4.33 (3.92)	2.57 (2.56)	
	Depression	**-2.42***	8.53 (4.58)	5.7 (3.17)	0.75	-1.58	9.07 (5.84)	6.7 (4.08)		-.86	4.27 (4.14)	3.33 (2.99)	
	Anxiety	-1.46	7.47 (2.77)	6.13 (2.93)		-0.43	7.67 (4.63)	7.17 (3.01)		0.87	2.4 (2.47)	3.13 (2.72)	
	Shyness	**-4.69****	12.6 (5.18)	6.7 (3.22)	1.46	**-3.57****	13.07 (6.41)	7.07 (4.67)	1.11	**-3.31****	7.73 (5.83)	2.5 (2.57)	1.30
	Somatization	-1.81	6.67 (3.63)	4.8 (3.05)		.017	5.67 (3.79)	5.87 (3.52)		-0.94	2.8 (3.48)	1.87 (2.9)	
	Adaptability	**2.48***	2.93 (4.07)	24.07 (3.94)	0.77	**2.74****	21.07 (3.55)	24.2 (3.63)	0.85	1.45	16.2 (3.85)	17.63 (2.67)	
	Social skills	**2.67***	23.67 (8.16)	29.13 (5.46)	0.83	**3.11****	24.87 (5.3)	29.9 (5.02)	0.97	1.41	11.8 (3.89)	14.37 (6.43)	
	Externalizing problems	-0.68	90 (15.58)	86.77 (14.7)		0.81	9.33 (7.2)	94.77 (12.2)		0.71	94 (14.33)	97 (15.16)	
	Internalizing problems	**-2.43***	146.33 (27.54)	129.83 (17.74)	0.76	-0.83	145.8 (35.59)	138.43 (23.27)		-0.62	146.2 (27.92)	141.47 (22.07)	
	Adaptative skills	**2.64***	85.53 (24.85)	102.8 (18.26)	0.82	**3.67****	85 (16.94)	104.7 (16.93)	1.14	1.62	94.67 (13.93)	102.37 (15.11)	

X_{BI} = Mean of the group of children with Behavioral Inhibition
X_{NBI} = Mean of the group of children without Behavioral Inhibition
SD = Standard deviation
d^A = Value of the effect size (*d*) of Student's t according to Cohen's (1988)
* The Student t-test is significant at .05 level (bilateral)
** The Student t-test is significant at .01 level (bilateral)

Consistently with previously described data (see Tables 1 and 2), Table 3 shows that BI girls scored significantly higher on shyness by all informants and assessment measures. There was consensus between fathers and mothers that BI differed from no-BI girls on a limited number of variables: hyperactivity, adaptability, externalizing problems, social and adaptive skills. However, only fathers identified their BI girls as significantly less aggressive compared to mothers, while only mothers informed lower levels of anxiety in their BI girls. Apart from shyness, teachers scored higher on anxiety/depression symp-

tomatology, somatic complains, other and mixed-type problems, internalizing disorders and problems in the educational environment, without any consensus with the family context.

Table 3

T test for the variables evaluated by C-BCL (C-TRF) and BASC among girls with behavioral inhibition (n = 22) and without behavioral inhibition (n = 42) in each of the three informants

		Father				Mother				Teacher			
	Variables	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A
C-BCL and C-TRF	Emotional reactivity	-0.34	2.32 (2.14)	2.12 (2.17)		0.70	2.09 (1.63)	2.48 (2.26)		-1.50	2.09 (2.91)	1.07 (1.74)	
	Anxiety/ depression	0.19	2.77 (1.92)	2.89 (2.25)		0.21	3.05 (1.81)	3.12 (2.37)		**-3.21****	4.41 (3.91)	1.5 (2.28)	0.98
	Somatic complaints	-1.44	2.73 (2.02)	2.05 (1.62)		0.55	2.14 (2.12)	2.45 (2.2)		**-1.89***	2 (2.89)	0.74 (1.59)	0.59
	Shyness	**-2.61***	2.59 (1.89)	1.38 (1.68)	0.68	**-2.47***	2.23 (1.84)	1.14 (1.31)	0.72	**-2.80***	3.91 (4.54)	1.05 (2.1)	0.90
	Attention problems	0.57	2 (1.86)	2.29 (1.91)		0.78	1.82 (1.73)	2.17 (1.65)		-0.25	2.91 (3.16)	2.71 (2.77)	
	Aggressive behavior	1.26	6.73 (5.1)	8,62 (5.94)		1.34	7.27 (4.65)	9.14 (5.59)		-0.25	5.17 (5.74)	4.83 (6.92)	
	Sleep problems	0.80	2.32 (1.96)	2.83 (2.62)		0.37	2.73 (1.9)	2.98 (2.81)					
	Other problems	-0.53	8.05 (4.8)	7.4 (4.36)		-0.34	7.95 (4.1)	7.55 (4.72)		**-2.88****	9 (7.4)	4.38 (5.29)	0.75
	Internalizing disorders	-1.25	1.32 (6.43)	8.24 (6.24)		-0.23	9.5 (5.12)	9.12 (6.67)		**-2.89****	12.41 (12.08)	4.36 (6.78)	0.89
	Externalizing disorders	1.14	8.73 (6.55)	1.79 (6.94)		1.32	9.09 (5.69)	11.31 (6.64)		-0.27	8.18 (8.2)	7.55 (9.27)	
	Mixed type problems	-0.24	1.36 (5.75)	9.98 (6.21)		-0.09	1.68 (5.12)	1.52 (6.929		**-2.34***	29.59 (25.67)	16.29 (19.16)	0.51
	Total problems	0.05	29.5 (17.35)	29.24 (17.81)		0.48	28.86 (13.55)	31.02 (18.31)		-	-	-	

Table 3

T test for the variables evaluated by C-BCL (C-TRF) and BASC among girls with behavioral inhibition (n = 22) and without behavioral inhibition (n = 42) in each of the three informants (cont.)

		Father				Mother				Teacher			
	Variables	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A	t	X_{BI} (SD)	X_{NBI} (SD)	d^A
BASC	Aggressiveness	2.07*	4.32 (2.78)	6.16 (3.71)	0.54	1.75	4.95 (3.59)	6.69 (3.83)		0.54	4.27 (5.37)	4.95 (4.38)	
	Hyperactivity	**3.59****	11.27 (4)	16.45 (6.08)	0.94	**2.69****	13.09 (5.08)	17.76 (7.24)	0.70	1.14	4 (6.16)	6.14 (5.53)	
	Attention problems	0.55	5.95 (2.9)	6.4 (3.15)		0.49	5.45 (3.5)	5.86 (2.84)		-1.39	5.86 (4.97)	4.31 (3.8)	
	Atypicality	0.06	1.77 (1.92)	1.74 (2.00)		1.35	1.18 (1.5)	1.76 (1.69)		-0.70	3.18 (3.23)	2.5 (3.87)	
	Depression	0.90	5.5 (3.71)	6.48 (4.26)		1.42	5.59 (3)	6.93 (3.84)		-1.92	4.95 (4.75)	3.10 (2.97)	
	Anxiety	1.61	4.86 (2.16)	6.05 (2.06)		**3.25****	4.59 (1.99)	6.88 (3.63)	0.71	-1.05	2.45 (2.44)	1.86 (1.98)	
	Shyness	**-3.33****	11 (5.23)	7.12 (3.94)	0.87	**-2.45***	1.73 (5.21)	7.5 (4.85)	0.64	**-4.74****	8 (5.09)	2.45 (2.83)	1.46
	Somatization	-1.70	6.73 (3.57)	5.26 (3.1)		-1.29	6.55 (4.29)	5.36 (2.97)		-1.62	4 (6.8)	1.55 (2.56)	
	Adaptability	**3.18****	2.73 (3.28)	23.76 (3.77)	0.83	**3.15****	2.95 (4.07)	24.12 (3.67)	0.82	1.01	16.41 (3.39)	17.36 (3.65)	
	Social skills	**2.74****	25.14 (5.37)	29.12 (5.58)	0.71	**2.63***	27.18 (5.51)	31.21 (5.95)	0.69	0.60	15.64 (6.95)	16.74 (6.88)	
	Externalizing problems	**3.03****	76.18 (11.72)	87.55 (15.339	0.96	**2.44***	8.09 (12.75)	9.5 (17.68)	0.64	1.04	88.59 (18,5)	93.21 (15.92)	
	Internalizing problems	0.02	13.14 (18.95)	13.31 (3.64)		1.31	129.09 (18. 94)	136.79 (23.64)		**1.72***	151.86 (39.17)	136.74 (17.66)	0.55
	Adaptative skills	**3.21****	87 (16.15)	102.36 (33.68)	0.84	**3.36****	91.32 (17.31)	107.21 (18.24)	0.88	0.83	102.14 (19.31)	106.43 (19.69)	

X_{BI} = Mean of the group of children with Behavioral Inhibition
X_{NBI} = Mean of the group of children without Behavioral Inhibition
SD = Standard deviation
d^A = Value of the effect size (*d*) of Student's t according to Cohen's (1988)
* The Student t-test is significant at .05 level (bilateral)
** The Student t-test is significant at .01 level (bilateral)

Overall, shyness appears to present a unique picture as it was the only variable to differentiate BI children, regardless of gender, informants and measure. Further, consensus between fathers and mothers to distinguish significantly (and at least medium effect size) their BI boys and girls was limited to the following BASC subscales: adaptability, social and adaptive skills.

DISCUSSION

This study has explored the socioemotional and behavioral characteristics of children identified as behaviorally inhibited in the two most important contexts for any child, that is, family and school, based on information provided by both parents and teachers. One of the strengths of this study is the use of data collection from both the father, mother and teacher as sources of information either in the family or educational environment, an approach which goes beyond most studies that have almost exclusively gathered information from the mother alone, which adds further value to this study. This allows for a more comprehensive and in-depth overview of children's behavior from one context or another.

First, Table 1 reveals that both parents scored their inhibited children significantly lower in social skills and in adaptability/adaptive skills compared to their uninhibited children. This suggests that inhibited children present with lower and/or worse levels of adjustment, which may be due to their shyness and lack of social skills that the parents may identify as signs of anxiety and depression. This is strongly supported in literature, in the sense that BI is often associated with anxiety and depression (e.g., Muris et al., 2011; Schofield et al., 2009). Further, teachers reported BI children scored higher than their uninhibited peers for shyness, anxiety/depression and internalizing disorders. However, contrary to parents, teachers have reported higher levels of somatic complaints in their identified BI students, regardless of gender. Somatic complains may have been seen as potential signs of anxiety symptomatology by teachers. This data aligns with the results from some researchers who have stated that going to school can be particularly stressful for inhibited children (e.g., Coplan & Arbeau, 2008). It has been argued that BI children may find extremely difficult to meet academic demands, for example, those related to verbal participation. All this may compound a child's emotional distress, appearing as symptoms of anxiety and depression, where we find somatization or somatic complaints which children may exhibit in the classroom (Ballespí et al., 2012). In addition, in contrast with the findings in the family context, teachers did not score lower social and adaptive skills. It must be noted that one of the main tasks of a school teacher, particularly at preschool level, is to promote and facilitate interaction among children, adopting a methodology with an emphasis on participation, which may well mask or even minimize the potential difficulties that these children may face. However, our data are similar to previous study that found that while young children with behavioral inhibition displayed more reticent behavior than their uninhibited peers, no differences were found between them when it came

to social play (Coplan et al., 2009). One hypothesis may be that BI children behave differently in diverse scenarios. Thus, Schneider et al. (2000) informed that extremely inhibited or reticent children would generally engage less in social contacts outside of school than other children. Further, some authors reported that parents of shy and anxious children tend to overprotect their sons and daughters more, helping them to avoid novel and/or social activities if they feel they may constitute a source of stress or distress for them (Espinosa-Fernández, 2009; Rubin et al., 2001).

Taking gender into consideration, both fathers and mothers tend to notice more problems and difficulties with their inhibited sons over their daughters. Firstly, these differences may reflect the different criteria or parenting sensitivity of mothers and fathers regarding their children's behavior and manifestations, particularly of fathers towards their boys. One hypothesis is that fathers may tend to tolerate to withdrawn and inhibited behavior from their girls, but believe that boys should be "brave" and "strong" (Engfer, 1993; Stevenson-Hinde, 2000). Thus, if inhibited boys feel forced by their fathers to be less inhibited and reticent in their behavior, they may react in an aggressive and defensive manner due to the frustration felt at not being able to do what a family member expects of them, in this case the father. As far as gender and teachers as informants are concerned, they expressed that BI boys show fewer difficulties compared to girls. Bearing in mind girls tend to be more emotional and prosocial (Etxebarria et al., 2003), the presence of difficulties in these aspects may be more prominent when it appears in girls rather than boys.

One of the significant findings to emerge from this study is the agreement among the three informants for shyness, regardless of the context and measure. This suggest shyness is closely associated to behavioral inhibition. Finally, it is crucial to implement interventions aimed at enhancing adaptability, social and adaptive skills.

Overall, the results obtained demonstrate that children who show greater BI present with lower levels of socioemotional and behavioral adjustment than their uninhibited peers. This occurs across different contexts and different informants. Specifically, the findings reveal that, in those cases where significant differences were detected, it was the inhibited children who scored higher for those variables that can be described as negative, namely shyness, anxiety/depression, somatization/somatic complaints and emotional reactivity. However, for the variables considered positive, such as adaptability, social skills and adaptive behavior (a combination of the previous two), uninhibited children presented higher scores than their inhibited counterparts, this being more evident in the family context.

Limitations of this study include the exclusive participation of female teachers, as no male instructors figured among the teaching staff. Future research would

benefit from implementing a longitudinal perspective, as some studies found that differences between children with and without BI are more robust in assessments in longitudinal studies with three-year follow-ups (Rosenbaum et al., 1993).

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The four Ws of test anxiety:
What is it, why is it important, where does it come from, and what can be done about it? • pág. 31-52
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The four Ws of test anxiety: What is it, why is it important, where does it come from, and what can be done about it?

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Abstract

Test anxiety refers to the tendency to appraise tests and test-like situations, where performance is evaluated, as threatening, and respond with high levels of state anxiety. High levels of test anxiety are associated with lower performance on test and examinations, and may also meet diagnostic criteria for clinical anxiety. In this paper we review: (i) the importance of the test anxiety construct and consider whether test anxiety may constitute a risk factor for clinical anxiety; (ii) the theoretical antecedents of test anxiety, with a specific focus on the Self-Regulatory Executive Function (S-REF) Processing Model; and (iii) interventions for test anxiety in adolescents, with a specific focus on one cognitive--behavioural intervention, Strategies to Tackle Exam Pressure and Stress (STEPS). We bring the review to a close with a consideration of what the next steps might fruitfully be for research, theory, and intervention, and conclude there is much work still yet to be done in the field of test anxiety.

Keywords: test anxiety, generalised anxiety, panic, self-regulation, cognitive-behavioural intervention, STEPS.

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Ansiedade aos Testes: O que é, porque é importante, de onde vem e o que pode ser feito acerca disso?

Resumo

Ansiedade aos testes refere-se à tendência para percecionar os testes (e situações semelhantes em que o desempenho é avaliado) como ameaçadoras, respondendo com elevados níveis de ansiedade-estado. Níveis elevados de ansiedade aos testes estão associados a um menor desempenho em testes e avaliações, podendo preencher critérios diagnósticos para ansiedade clínica. Neste artigo iremos rever: (i) a importância do conceito de ansiedade aos testes, discutindo se a ansiedade aos testes se pode constituir como um fator de risco para ansiedade clínica; (ii) os antecedentes teóricos da ansiedade aos testes, com especial incidência no Modelo de Processamento baseado na Função Executiva Auto-Reguladora (*Self-Regulatory Executive Function [S-REF] Processing Model*); e (iii) intervenções na ansiedade aos testes em adolescentes, nomeadamente, uma intervenção cognitivo-comportamental denominada Estratégias para lidar a Pressão e o Stress dos Exames (*Strategies to Tackle Exam Pressure and Stress – STEPS*). Terminamos esta revisão discutindo os próximos passos que poderão contribuir para a investigação, a teoria e a intervenção, concluindo que há muito ainda a fazer na área da ansiedade aos testes.

Palavras-chave: ansiedade aos testes, ansiedade generalizada, pânico, autorregulação, intervenção cognitivo-comportamental, STEPS.

INTRODUCTION

In this paper we provide a brief review of the test anxiety literature to address four key questions of concern to researchers, practitioners, policy makers, parents, and not least, students themselves. These questions are: (i) what is test anxiety; that is, how can it be defined and conceptualised?; (ii) why is it important; that is, what are the potential deleterious consequences of test anxiety?; (iii) where does test anxiety come from; that is, what are the theoretical antecedents of test anxiety?; and (iv), what can be done about it; that is, what interventions are available to reduce test anxiety? Test anxiety has a long history within the educational and psychological literature and there have been several notable texts (e.g., Spielberger & Vagg, 1995; Zeidner, 1998) and reviews of the literature (e.g., McDonald, 2001; Putwain, 2008; Zeidner, 2007, 2014). In the present review, our aim was to include contemporary test anxiety theory and research alongside the classic in order to provide an overview of the field.

TEST ANXIETY: WHAT IS IT?

Test anxiety refers to an enduring, trait-like tendency to appraise performance-evaluative situations as threatening and react with elevated state anxiety (Spielberger & Vagg, 1995). Performance-evaluative situations are those in which one's performance is evaluated in some way, such as the tests and examinations used in all stages of education. Test anxiety is widely considered to be multidimensional and early conceptions differentiated between distinct, but related, cognitive and affective-physiological components (Liebert & Morris, 1967; Spielberger et al., 1978). The prototypical cognitive component (originally labelled as worry) refers to self-focused negative thoughts about failure and their consequences (e.g., letting oneself down, and not fulfilling aspirations). The prototypical affective-physiological component (originally labelled as emotionality) refers to perceptions of physiological arousal (e.g., tension, elevated heart rate, stomach discomfort, and so on).

Subsequent models of test anxiety have included additional or alternative cognitive components namely test-irrelevant thoughts (Benson et al., 1992), distraction and confidence (e.g., Hodapp, 1996), and cognitive obstruction (Friedman & Bendas-Jacob, 1997). The affective-physiological component has also differentiated general feelings of test anxiety from the specific physiological symptoms of anxiety (Benson et al., 1992; Hagtvet & Benson, 1997). Furthermore, a social component (being judged negatively by others) has been proposed as a discrete component (Friedman & Bendas-Jacob, 1997; Lowe et al., 2007) along with behavioural (Wren & Benson, 2004) and motivational components (Pekrun et al., 2004).

A consequence of this proliferation of test anxiety components is a muddying of the test anxiety construct. It is not entirely clear to researchers and practitioners what components should or should not be included when measuring test anxiety or interpreting findings. There is also an added risk of jingle-jangle fallacies (see Kelley, 1927). This is where different labels (e.g., emotionality, tension, and autonomic reactions) are given to the same construct (i.e., the perception of physiological arousal; jangle) and different constructs (fear of failure, letting oneself down, and being judged negatively by peers) are given the same label (i.e., worry; jingle). Putwain et al. (2020) propose a potential solution to this conundrum by using contemporary test anxiety theories (e.g., Lowe et al., 2007; Pekrun, 2006; Segool et al., 2014; Zeidner & Matthews, 2005) to guide which components should be excluded. On this basis, test-irrelevant thoughts can be omitted as not being threat-related; social worries, confidence, and avoidance motivations can be omitted as being antecedents of test anxiety; and off-task behaviours can be omitted for being difficult to operationalise. Putwain et al.'s (2020) approach leaves two cognitive components (worry and the perception of cognitive interference) and

two affective-physiological components (tension and indicators of physiological arousal). It is not expected that all theorists will necessarily agree with their approach however what is important, moving forward, is that researchers make theoretically informed decisions when planning test anxiety research in their decisions over which components are included or excluded.

TEST ANXIETY: WHY IS IT IMPORTANT?

The principal importance of studying test anxiety is derived from a long standing body of evidence showing that test anxiety, and in particular the cognitive component, is negatively related to a wide form of educational achievement, test and examination performance (Hembree, 1988; Seipp, 1991; von der Embse et al., 2018). For instance, in the meta-analysis of 238 studies from 1988 to 2018, von der Embse et al. (2018) reported *r*s of -.26 for the relation between the cognitive component of test anxiety and performance on standardised examinations, and -.13 for the affective-physiological component. Such negative correlations cannot be interpreted causally; it is equally plausible that that low achievement could result in subsequent higher anxiety as it is that higher anxiety could result in subsequent lower achievement. It is notable, however, that longitudinal designs have shown that test anxiety can predict lower future achievement after controlling for prior achievement (Putwain et al., 2015) and cognitive ability (Putwain et al., 2013). Longitudinal studies of this type provide evidence that test anxiety is directionally related to achievement. Given the ethical and practical implausibility of artificially raising levels of test anxiety in an experimental manipulation purely for the purposes of demonstrating a causal link to lower task performance (although this does not preclude the possibility of improving task performance after intervening to reduce test anxiety), longitudinal naturalistic data remains the best evidence available at the present time.

The negative relation between test anxiety and achievement is believed to arise from cognitive interference during examinations (Wine, 1971, 1982). Although not specifically a theory of test anxiety, anxiety-performance relations are theorised most precisely and eloquently in the Attentional Control Theory (ACT: Derakshan & Eysenck, 2009, 2011; Eysenck et al., 2007). According to ACT, the cognitive component of anxiety interferes with working memory (WM) processes including inhibition (the ability to control automatic or task-irrelevant stimuli), shifting (moving back and forth between multiple task operations), and updating (recalling information from long-term memory). The result is reduced WM capacity for

current task processing, resulting in difficulty concentrating, thinking clearly, and recalling information that has been learnt. A typical experience of a highly test anxious person during an exam is to 'go blank' (Putwain, 2009). Empirical tests of ACT have shown that the lower performance of high test anxious persons are the result of WM interference in both lab (Angelidis et al., 2019; Dutke & Stöber, 2001; Putwain et al., 2014; Richards et al., 2000) and naturalistic studies (Owens et al., 2008, 2012a, 2012b).

There is, however, another good reason why test anxiety should be considered as an important construct, albeit one that has received less attention in the academic literature. Irrespective of whether test anxiety is disruptive for learning and test and examination performance, a high level of state anxiety is in and of itself an inherently unpleasant experience. Furthermore, high levels of test anxiety may be related to, or an indicator of, low subjective wellbeing and personal welfare. A corollary is that test anxiety may be risk factor for more serious forms of anxiety (e.g., clinical anxiety disorders).

Subjective wellbeing refers to the global judgement of the balance between the various positive and negative elements of one's life (Diener et al., 2018; Hascher, 2010). Experiences at school, college, and university (and any other place of formal or informal learning) could contribute to higher or lower subjective wellbeing through relationships with others, emotions (e.g., enjoyment of learning), feeling valued, experiencing physical or social problems, and so on. High test anxiety could potentially contribute to lower subjective wellbeing through the presence of unpleasant failure-focused emotions and cognitions, the perception of learning, one's place of learning, and the teaching staff, as being associated with excessive pressure, and the anticipation of threats to one's sense of self-worth. Despite the contribution of test anxiety to wellbeing not being as prominent or well recognised within the literature as the contribution to achievement, evidence for the link is long-standing.

Hembree's (1988) meta-analysis of 562 studies from 1950 to 1986 reported that test anxiety was negatively correlated with subjective wellbeing (r = -.33). More recently Hascher (2007) reported rs = -.15 to -.46, and Putwain et al. (2020) reported rs = -.03 to -.31 (in these two studies the rs varied depending on the component of test anxiety). In a longitudinal design, Steinmayr et al., (2016) showed that higher worry predicted lower subsequent mood and life satisfaction (two indicators of subjective wellbeing) after controlling for prior subsequent mood and life satisfaction, but not vice versa. The relations between test anxiety (or to be precise the cognitive, not the affective-physiological, component) and wellbeing were directional.

In dual process models (Suldo & Shaffer, 2008; Suldo et al., 2016), the presence of psychopathology is not the polar opposite of subjective wellbeing in a unidimensional fashion. Rather, subjective wellbeing and psychopathology are intersecting but distinct

dimensions and can be figured in a 2x2 matrix. Complete mental health would be indicated by the presence of high subjective wellbeing and low mental disorders and similarly, the presence of a mental disorder does not map directly to low wellbeing. If other elements of a person's life (e.g., relationships, environment, and so on) are good, subjective wellbeing can be relatively high even in the presence of a mental disorder (a group labeled by Suldo and Shaffer (2008) as 'symptomatic but content'). Even though higher test anxiety is related to lower wellbeing, this might not implicate test anxiety as being a risk factor in the development of clinical anxiety disorders. It is possible for high wellbeing to co-exist with test and/or clinical anxiety.

The relations between test anxiety and emotional psychopathology (symptoms of anxiety and depression) have not been extensively researched. Warren et al. (1996) compared students in Grades 4, 7, and 11, scoring in the $\leq 33^{rd}$ and $\geq 66^{th}$ percentiles of Test Anxiety Inventory (TAI) scores. Students in the upper tertile of TAI scores reported higher clinical anxiety and depression. Herzer et al. (2014) used a receiver-operator curve analysis to show that test anxiety scores in the $\geq 66^{th}$ percentile of the German TAI could reliably predict clinical anxiety (social anxiety or specific phobia), assessed through a clinical interview, with 96.6% accuracy. Furthermore, a study of adolescent suicide over a 16-month period found that examination pressures were cited as a specific cause in 15% of Coroners' reports and academic pressures more widely in 27% (Rodway et al., 2016).

It is widely accepted that high levels of (general) trait anxiety is a risk factor for generalised clinical anxiety (Rapee, 2001) and emotional disorders more generally (Kennedy et al., 2001). The aforementioned findings (Herzer et al., 2014; Rodway et al., 2016; Warren et al., 1996) would indicate that high levels of trait test anxiety would also be a risk factor. Indeed, LeBeau et al. (2010) argue that high levels of test anxiety could be accommodated under existing DSM-5 criteria for social or specific phobia, or generalised anxiety (also see Gerwing et al., 2015). According to the integrated network approach (Heeren & McNally, 2016, 2018) anxiety is represented as associated nodes of directly and indirectly connected symptoms. Central nodes are those that are more densely and closely connected to others and the activation of central nodes acts as a 'hidden generator' to spread anxiety activation throughout the network and render the person vulnerable to an anxiety disorder. Hence, anxieties about one situation can quickly and easily generalise to others. If test anxiety features represent central nodes in a network of associated anxiety symptoms then the activation of test anxiety nodes could spread to other anxiety symptoms and increase the risk of developing an anxiety disorder. It is notable that two core transdiagnostic processes across anxiety disorders, namely the presence of intrusive worrisome thoughts and a difficulty in disengaging from threat triggers (Clark & Rhyno, 2005), are present in test anxiety.

TEST ANXIETY: WHERE DOES IT COME FROM?

There are four contemporary theories of test anxiety to account for how and why test anxiety develops. These are Spielberger and Vagg's (1995) transactional process model, Zeidner and Matthew's (2005) Self-Regulatory Executive Function (R-REF) Processing Model, Lowe et al.'s (2007) biopsychosocial model, and Segool et al.'s (2014) cognitive behavioural model. Although it is not specifically a theory of test anxiety, Pekrun's (2006) control-value theory can also be considered here, as test anxiety falls under one of the achievement emotions considered. Spielberger and Vagg's (1995) transactional process model is a micro-level theory that provides a moment-by-moment account of how levels of state anxiety may fluctuate during a test situation based on the perceived item difficulty, one's test taking skills, and perceived ability to answer the question. The remaining theories are less granular and provide an account of why a specific testing situation, or testing situations in general, result in elevated test anxiety.

The theory we elaborate on is Zeidner and Matthew's (2005) S-REF model. We chose this model as in our view it articulates the processes involved in the development of anxiety in a greater level of specificity than the other theories, although it does share common elements with other theories, and is not without criticism. The greater level of specificity in processes allows for a greater input into the development of intervention. The S-REF model was originally developed as a model of emotion disorders (Wells & Matthews, 1994, 1996) that was adapted to test anxiety (Matthews et al., 1999), and subsequently a range of evaluation anxieties, including test anxiety, public speaking anxiety, and so on (Zeidner & Mathews, 2005). The S-REF model is organised around three inter-related dynamic systems: self-regulatory executive processing, self-knowledge beliefs, and maladaptive person-situation interactions.

Self-regulatory processes are triggered by either external or internal events. An external event could be receiving a date and time for a forthcoming examination, or being reminded about the importance of preparing well for a forthcoming examination by a teacher. An internal event could be cognitive (e.g., recalling a forthcoming examination), but also include bodily sensations of arousal as a signal one is potentially anxious. Self-regulatory processes include an appraisal of the trigger event in relation to one's goals (e.g., is this examination important to me?; what will happen if I fail?), how one plans to cope with the trigger event (e.g., distract oneself, or spend time studying), and metacognitive beliefs. Test anxious persons appraise examinations as being personally important, use maladaptive approaches to cope (for a review see Skinner & Saxton, 2019) and

hold metacognitive beliefs that maintain or amplify the anxiety (e.g., worrying helps me to stay focused).

Regulatory processes are driven by, and draw on, self-beliefs including one's perceived competence in studying, test-taking skills, and the material that is being tested, based on prior experience as well as exaggerated beliefs about failure (e.g., catastrophizing, personalisation, and perfectionism). Test anxious persons have poor competence beliefs and/or exaggerated beliefs about failure. Maladaptive person-situation interactions include a biased attention to threat, avoidance of opportunities to improve one's competence or skills through effort withdrawal, procrastination, and other academic self-handicapping strategies, driven largely by avoidance. Such strategies might protect one's sense of self-worth against failure, but ultimately and paradoxically increase the likelihood of failure (see Covington, 2009). Maladaptive person-situation interactions feedback to self-beliefs (e.g., reinforcing the belief that one has low competence) and increase the likelihood of future self-regulatory triggers being appraised in the same way, thus locking the person into a debilitating cycle of anxiety.

There is evidence for many of the links proposed in the S-REF model including the role of poor competence beliefs (e.g., Pekrun et al., 2004; Putwain & Aveyard, 2018; Putwain, Woods, et al., 2010), maladaptive coping processes (Putwain et al 2012, 2016; Stöber, 2004), avoidance coping (e.g., Eum & Rice, 2011; Putwain & Symes, 2012), metacognition (Matthews et al., 1999; O'Carroll & Fisher, 2013), perfectionism and cognitive distortions (Putwain, Connors, et al., 2010; Stöber et al., 2009), and maladaptive person-situation interactions (Cassady, 2004; Gadbois & Sturgeon, 2011; Putwain, 2019; Putwain et al., 2011).

There are, however, two main drawbacks to the S-REF model we would like to highlight. First, emotion regulation, attempts to suppress or enhance the experience or expression of emotions (see Gross & Thompson, 2007), is a central self-regulatory process yet has received scant attention in the S-REF model. Emotion regulation would be expected to play a key role in determining how people respond prior to and during examinations, and is an important antecedent of test anxiety (Harley et al., 2019). Second, the S-REF model is highly individualised and unlike some of the other theories (e.g., Lowe et al., 2007; Segool et al., 2014) does not account for wider ecological and social factors (e.g., school ethos, class climate, testing regimes, etc.) that impact on test anxiety. There is scope for further theoretical development of the S-REF model to incorporate these important elements.

Despite these drawbacks, the S-REF models offers multiple possible points for intervention based on each of the three systems. Self-regulatory processes can be targeted to ensure that persons can distinguish between adaptive and maladaptive

forms of coping, and be taught how to plan for and use adaptive forms of coping. People can be taught to monitor maladaptive metacognitive beliefs (e.g., that worry is helpful) and biased and exaggerated thinking (e.g., catastrophic beliefs about failure), how to challenge such beliefs, and identity and adopt more realistic beliefs. If self-beliefs about low competencies are rooted in reality, interventions can include study and test-taking skills training and practice. In a psychological intervention there may not be the skills or time to address low competence beliefs in the material to be examined (and this is best left for those tasked with regular instruction) however people can be helped to plan effective ways of building their subject-specific competencies (e.g., using principles of self-regulated learning). This approach will also be useful for breaking cycles of maladaptive person-situation interactions rooted in avoidance (e.g., procrastination and effort withdrawal); cycles of behaviour that maintain anxiety that are rooted in avoidance can also be challenged during intervention. Finally, relaxation strategies, including progressive muscle relaxation and diaphragmatic breathing, can be included as methods for controlling acute anxiety responses, which can act as triggers for further cycles of executive self-regulation.

TEST ANXIETY: WHAT CAN BE DONE ABOUT IT?

A variety of different types of psychological interventions have been shown to be effective in reducing test anxiety. The meta-analysis by Hembree (1988) included 137 treatment studies of behavioural, cognitive, study-skills, and test-taking skills, interventions, and combinations of these approaches. All approaches successfully reduced test anxiety; the largest statistically significant effect was for behavioural intervention when combined with study skills training (mean reduction in test anxiety = -1.22) and the smallest statistically significant effect was for cognitive-behavioural intervention in pre-college students (mean reduction in test anxiety = -0.53). Ergene's meta-analysis (2003) of 56 studies from 1974 to 1998 also included the aforementioned interventions (behavioural, cognitive, and skill-focussed, either alone or in combination). All were successful in reducing test anxiety with an average effect size of 0.65; the largest effect was for cognitive intervention when combined with skills focus (average standardised effect size = 1.22) and the smallest effect was for cognitive-behavioural intervention (average standardised effect size = 0.36).

Far fewer studies have examined the effect of test anxiety interventions on achievement or test scores. Given that high levels of test anxiety are associated

with lower achievement and test performance, a reduction in test anxiety might be expected to coincide with greater achievement and test performance. Vagg and Spielberger (1995) reviewed six intervention studies based on behavioural interventions alone or in combination with study-skills training. Although all techniques were effective in reducing test anxiety, only the combined behavioural intervention with study-skills training improved test performance. In the only study we are aware of to examine whether a test anxiety intervention could improve achievement in secondary school students, Keogh et al. (2006) showed that students participating in a 10-week cognitive-behavioural intervention performed better on high-stakes secondary school leaving examinations, than their cognitive ability matched, randomly assigned, control group counterparts.

Ergene (2003) noted that few of the interventions were specifically designed for populations of school children. A review of interventions targeted specifically at school aged populations a decade later (2000 to 2010) revealed little had changed; only 10 studies published during this period included school-aged participants (von der Embse et al., 2013). This is somewhat surprising and also concerning. Adolescence is a critical period both educationally, where in many countries students take high-stakes examinations, and developmentally, where stress-sensitive limbic and cortical areas of the brain are vulnerable (Romeo, 2013). It is notable that anxiety developing during childhood tends to re-occur throughout one's life (Garber & Weersing, 2010). We now describe an intervention for test anxiety used in English secondary schools along with three evaluation studies.

In England, along with Wales and Northern Ireland, secondary education covers Years 7 to 11 (ages 11-16 years). At the end of Year 11 students take high-stakes standardised examinations, known as GCSEs (General Certificate of Secondary Education). Entry into upper secondary academic education, college-based vocational or technical education, or work-based training and apprenticeships, depends on a minimum pass grades in English and mathematics, along with a profile of pass grades in other subjects depending on the focus on ones' post-16 study (Onion, 2004; Roberts, 2004). Furthermore, employment in all occupations, other than routine or manual, requires minimum pass grades in English and mathematics and some competitive professions require high grades in the majority of examinations taken (Maguire, 2010; Unwin, 2010). Furthermore, school GCSE results are published in a competitive fashion that ranks schools in a particular locality into 'league tables' (to use a sporting analogy). The school inspectorate regime was until recently[3] also

3 A new inspection framework was introduced in September (2019) that placed a greater emphasis on student wellbeing (Office for Standards in Education, Children's Services and Skills, 2019).

heavily focused, for secondary schools, on GCSE performance with the power to recommend replacing the management of schools, or even closing schools, where students were judged to be underperforming (Department for Education, 2016; Perryman, 2006; Perryman et al., 2011; Roberts & Abreu, 2016). As a result of their importance, the GCSE context is a highly appropriate one in which to provide and evaluate test anxiety intervention.

Strategies to Tackle Exam Pressure and Stress (STEPS) is a six-session programme designed to address the dearth of test anxiety interventions for secondary students more generally, and specifically to address the lack of interventions available for use in English secondary schools (Putwain et al., 2014). To our knowledge, there has only been one published intervention using samples of English secondary school students prior to STEPS (Keogh et al., 2006). STEPS was designed as a multimodal intervention to include management strategies that target distinct cognitive, behavioural, and emotional aspects of test anxiety. In comparison to less eclectic interventions, multimodal approaches can increase the number of management strategies offered to an individual (Flaxman et al., 2003) increasing the likelihood of a person finding strategies they are able to make use of.

STEPS was based on Well's (1997) approach to cognitive-behavioural interventions (drawn from the S-REF model) and existing cognitive-behavioural test anxiety interventions (Flaxman et al., 2003; Gregor, 2005) combined with study and test-taking skills training. Each of the six sessions has a different focus. The aim of session one is to allow participants to recognise the signs and effects of, and the triggers for, test anxiety. The aim of session two is to recognise and challenge negative and debilitating thought patterns, and practice more positive ways of thinking about exams. The aim of session three is to learn and practice relation techniques including diaphragmatic breathing and progressive muscle relaxation. The aim of session four is to learn and practice a range of study and test-taking skills. The aim of session five is to learn how different forms of motivation influence study approaches and test-anxiety. The aim of session six is to review the different approaches in earlier sessions and consider what aspects worked most effectively. More details for the content of each session are provided in Putwain et al. (2014).

The content of each session was programmed into the presentational software Articulate to allow for a standardised presentation. The content of each session included the following elements: Psychoeducational instruction, quiz-based reinforcement of learning, self-reflection exercises (these were recorded in an accompanying booklet), practice of anxiety management techniques, and short video clips of adolescent students talking about their own experiences of test anxiety and use of anxiety management strategies. Each session takes approximately 40 minutes to complete.

Three formal evaluations of STEPS have been undertaken. In the first study, 3225 students in Years 10 and 11 of English secondary education, studying for their GCSE examinations, were randomly allocated to intervention or wait-list control groups (Putwain et al., 2014) and test anxiety measured pre- and post-intervention. STEPS was completed by participants as a self-help tool and the completion rate was poor: only 217 participants (13.7%) of the 1600 allocated to the intervention group completed all six sessions. With such a poor completion rate, an intention to treat analysis would not be meaningful. Instead, participants who had completed all six sessions were compared to control group participants and a randomly sampled group of participants initially allocated to receive the intervention, but who did not complete all six sessions. Thus, analyses were unable to make use of the random allocated procedure and the design becomes more akin to a quasi-experimental allocation. For those in the pre-intervention lower 66th percentile of scores (i.e., those who were initially low or mid in test anxiety) STEPS did not have any effect on post-intervention anxiety. However, participants in the upper 66th percentile of pre-intervention test anxiety scores (i.e., those who were initially highly test anxious) showed lower test anxiety scores compared to control group participants (worry d = 0.63; tension d = 0.53) and intervention group participants who did not complete all six sessions (worry d = 0.89; tension d = 0.49).

A second study addressed the limitations of Putwain et al. (2014) in two ways. First, the intervention was delivered to a targeted group of highly test anxious persons and, second, the intervention was delivered to small groups of six to eight students by a trained facilitator (Putwain & Prescod, 2018). The study was conducted at two English secondary schools where 428 students in Years 10 and 11, studying for GCSE examinations, were screened using a standardised test anxiety measure. Fifty-six participants scored in the upper 66th percentile of scores and were randomly allocated to an early or late intervention groups. Follow-up measures were taken after the early intervention group had completed the six sessions and after the late intervention group had completed their sessions.

Participants in the early intervention group showed declines in worry (d = 0.76) and tension (d = 1.14) compared to those in the late intervention (control) group whose worry scores remained unchanged and tension scores showed a negligible decline (d = 0.08). Participants in the late intervention group showed similar declines in worry (d = 0.79) and tension (d = 1.14) after completing the STEPS sessions. Importantly, despite small increases, the worry (d = -.020) and tension (d = -0.09) scores of participants in the early group remained low. Uncertain control was also included in this study as a potential mediator and showed declines for

the early intervention group (d = 0.60) compared to those in the late intervention (control) group whose uncertain control remained unchanged. Uncertain control also declined in the late group following intervention (d = 0.47) and importantly the uncertain control scores of the early intervention group remained low. A meditational analysis showed the reduction in worry and tension scores were partly attributable to the reduction in uncertain control.

A third study also used a facilitator to deliver STEPS in small groups of targeted students (Putwain & von der Embse, 2021). The study was conducted at eight English secondary schools where 1073 students in Years 10 and 11, studying for GCSE examinations, were screened using a standardised test anxiety measure. One hundred and sixty-one participants scored in the upper 66th percentile of scores and were randomly allocated to an intervention or wait-list condition where the STEPS intervention was delivered in groups of six to eight students. In addition to test anxiety, this study also included two forms of clinical anxiety (generalised anxiety and panic) and school-related wellbeing as outcomes. Following intervention, test anxiety reduced at a greater rate (d = 0.86) than for control group participants (d = 0.62), and both generalised anxiety (d = 0.43) and panic (d = 0.54) were reduced following intervention in comparison to the scores of control group participants that did not change from pre- to post-intervention. A meditational analysis confirmed that the reduction in generalised anxiety and panic following intervention was attributable to the concurrent reduction in test anxiety. These findings provide indirect evidence for the integrated network approach to anxiety (Heeren & McNally, 2016, 2018) and the possibility that test anxiety may be a risk factor for clinical anxiety. The intervention did not, however, impact on school-related wellbeing, most likely a result of test anxiety being just one of several contributors of subjective wellbeing.

In addition to the schools and participants included in these formal evaluation studies, STEPS has also been delivered to partnership schools of the institution at which the first author is affiliated. Students aged 14-16 years, and studying for GCSE examinations, are targeted through a combination of screening using a standardised test anxiety questionnaire (to identify those scoring in the upper tertile of scale scores), self-referred students, and those identified through school staff with a responsibility for pastoral care of students. Students were invited to provide anonymous feedback after the sixth session on their experiences of STEPS and whether it was beneficial or not. The results reported in Table 1 below are based on informal feedback from students collected in the period 2016 to 2019 from 102 students. Students responded to six questions on a five-point scale (1 = 'strongly disagree', 3 = 'neutral', 5 = 'strongly agree').

Table 1
Anonymous feedback provided by Year 10 and 11 students after completing STEPS sessions

	Mean	***SD***
After completing STEPS I am in a better position to control my worry when revising for a test or exam	3.86	0.68
After completing STEPS I am in a better position to control my worry before going into a test or exam	4.10	0.89
After completing STEPS I am in a better position to control my worry during a test or exam	3.81	0.77
I can cope with the pressure of doing GCSE better after completing STEPS	3.65	0.75
STEPS has taught me useful techniques to deal with exam stress	4.02	0.69
I would use the techniques learnt in STEPS in an exam situation	4.22	0.77

These perceptions of the students who engaged in STEPS provide additional evidence for its effectiveness. In addition to these questions, the informal feedback provided the opportunity for students to write open text comments about the elements of STEPS that did and did not work in their view. In keeping with the nature of a multi-modal intervention, the same element (e.g., relaxation techniques) would be described as more effective by some students and less effective by others. No specific element of STEPS was described by the majority of students as being more or less effective. One element of STEPS that did seem to polarise opinions, were the use of video clips of students who had recently completed their GGCEs talking about their experiences. Students either seemed to strongly like or dislike these video clips. Those who strongly liked the video clips were reassured that they were not the only persons experiencing exam anxiety; those who did not like them described the clips as being 'forced' or 'not realistic'. This may reflect an individual difference in highly test anxious students (e.g., need for reassurance) that determines how specific persons respond to the different elements of the intervention. In future, it would be desirable to research these individual differences to tailor interventions more closely to the needs of specific individuals.

DIRECTIONS FOR FUTURE RESEARCH

From a theoretical perspective, there has been much research that examines specific elements of theories, for instance the relations between competence beliefs

and test anxiety as hypothesised in the S-REF (Zeidner & Matthews, 2005), cognitive-behavioural (Segool et al., 2014), control-value (Pekrun, 2006), and biopsychosocial models, but too few studies that examine multiple processes specified by these, and other, theories. Due to the complexity of these theories, it is unlikely that all of the processes could be examined within a single study. Carefully designed and executed studies could, however, incorporate multiple processes to provide more thorough tests of the processes and links specific in these, and other, models. Relatedly, there has been a move away in the past decade or so, in educational psychology research from relying on cross-sectional designs to using longitudinal designs with two or more waves or data, or intrapersonal designs to capture more real-time data. The field of test anxiety would substantially benefit from more studies of this type to provide more robust evidence for the processes specified in the aforementioned theories.

From a theoretical perspective, a substantial extension of control-value theory has been the consideration of emotion regulation (Harley et al., 2019). Given the regulation of emotions is likely to be key to understanding the development, maintenance, and possible treatment of test anxiety, this would not only be a fruitful area of future research, but also for integration more broadly within test anxiety theory. A parallel line of research to that of test anxiety has begun to study the 'choking under pressure' hypothesis (Wang & Shah, 2013). It is important to establish whether this phenomenon is simply test anxiety under a new label, or whether this new direction of research has important insights for test anxiety (e.g., a more detailed consideration of how working memory capacity interacts with perceived pressure) theory that was widely been considered thus far.

With regards to interventions, it is reassuring to see effective interventions developed for, and tested on, samples of children and adolescents reported in the literature. Recent examples in addition to the studies on STEPS reviewed above include mindfulness (Carsley & Heath, 2018), expressive writing (Rozek et al., 2019), attention training (Fergus & Limbers, 2019), diaphragmatic breathing (Khng, 2017), relaxation training combined with exposure (Weems et al., 2015), and cognitive-behavioural therapy (Yeo et al., 2016). However, there remains an overall dearth of evidence-based interventions for test anxiety in children and adolescents, and more studies are needed to either assess the factors that determine the effectiveness of existing interventions, or to develop and evaluate new interventions. An understanding on the mechanisms that mediate effective intervention (Powers et al., 2017) and the implementation characteristics that moderate effective intervention (Myers et al., 2012) are essential in being able to shape the effectiveness of future interventions. However, studies of this type are almost absent completely from the test anxiety literature. Hence, at present there is limited evidence on why interventions may be successful and the factors that can help implement effective test anxiety interventions. There is a desperate and urgent need for research in these areas.

CONCLUSIONS

We could conclude that while the degree of anxiety experienced by a student in a specific test or exam may at times be elevated and at other times reduced, the principal concern of researchers and practitioners are those people who tend to experience a high degree of anxiety in the majority of tests and exams that they take (people who are high in *trait* test anxiety). Test anxiety is an important phenomenon to take seriously for two reasons: it can obstruct achievement in test, or exam, performance, and can also be an indicator of (and possibly a risk factor of) clinical anxiety. Insights from various theoretical models suggest that high test anxiety develops from a complex interaction between the way that people appraise the importance and value of an examination, how they judge their capacity to prepare for and perform in that examination, and the approach that is actually taken to preparing for that exam. Fortunately, test anxiety is responsive to intervention and evidence currently available suggests that a number of intervention approaches could be utilised with samples of children or young people. Much scholarly work has already been undertaken on test anxiety. There is, however, much more work yet to be done.

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Impact of a transdiagnostic prevention protocol
for targeting adolescent anxiety and depression • pág. 53-68
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Impact of a transdiagnostic prevention protocol for targeting adolescent anxiety and depression

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Abstract

The present study examined the benefit of a transdiagnostic prevention program, Super Skills for Life – adolescent version (SSL-A), among adolescents with internalizing and externalizing problems in two types of school settings (mainstream school and pupil referral unit) using a randomized waitlist-controlled trial (RCT). The main aims were to examine the effects of the SSL-A in reducing internalizing and externalizing problems in adolescents, and to identify the moderating role of gender, age, and school type on the intervention outcome. The RCT involved 112 adolescents aged 11 to 14 years old, randomly allocated to either an SSL-A intervention group or a waitlist-control group (WLC). Adolescents in the intervention group participated immediately in the SSL-A, whereas adolescents in the WLC group received the intervention after the intervention group completed the six months follow-up assessment. Results showed that internalizing and externalizing problems were significantly reduced from pre-test to follow-up assessments. Gender, age and school setting moderated the intervention outcome. Specifically, males, younger adolescents and adolescents from mainstream schools showed a significant reduction over time on both internalizing and externalizing problems. Although SSL was designed to target internalizing problems, this study shows that it also had positive effects on adolescents with internalizing and externalizing problems.

Keywords: transdiagnostic, anxiety, depression, adolescents, cognitive-behavioural

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O impacto de um protocolo transdiagnóstico de prevenção de ansiedade e depressão em adolescentes

Resumo

O presente estudo explorou a eficácia do programa transdiagnóstico de prevenção, *Super Skills for Life – versão adolescente (SSL-A)*, em adolescentes com problemas internalizantes e externalizantes em dois tipos de escolas (escolas públicas convencionais e *pupil referral units*) usando um estudo randomizado controlado com lista de espera (RCT). Os objetivos principais consistiram em examinar os efeitos do SSL-A na redução de problemas internalizantes e externalizantes em adolescentes, e identificar o papel moderador do género, idade e tipo de escola nos resultados da intervenção. O RCT envolveu 112 adolescentes, entre os 11 e os 14 anos, distribuídos aleatoriamente para o grupo de intervenção SSL-A ou para o grupo de lista de espera. Os adolescentes do grupo de intervenção participaram imediatamente no programa SSL-A, enquanto os adolescentes do grupo de espera receberam a intervenção após o grupo de intervenção ter completado a avaliação do seguimento de seis meses. Os resultados mostraram que os problemas de internalização e externalização foram significativamente reduzidos do pré-teste para as avaliações de seguimento. O género, a idade e o tipo de escola moderaram os resultados da intervenção. Mais especificamente, rapazes, adolescentes mais novos e adolescentes de escolas convencionais mostraram uma redução significativa de problemas internalizantes e externalizantes ao longo do tempo. Embora o SSL tenha sido desenhado para os problemas de internalização, este estudo mostrou que o programa também teve efeitos positivos nos adolescentes com problemas de internalização e externalização.

Palavras-chave: transdiagnóstico, ansiedade, depressão, adolescentes, cognitivo-comportamental

INTRODUCTION

Internalizing problems such as anxiety and depression occur commonly among adolescents. It is estimated that up to 30% of adolescents in the general population are affected by anxiety and depression which cause significant distress and impairment in major areas of life (Essau, Lewinsohn, et al., 2014). Anxiety and depression also co-occur frequently with externalizing problems such as conduct problems (Essau, Lewinsohn, et al., 2014; Frick et al., 2013). Recent studies have

indicated that these internalizing and externalizing problems shared some common risk factors, including low self-esteem and social skills (Essau & de la Torre-Luque, 2019; de la Torre-Luque & Essau, 2019). Individuals with comorbid disorders tend to experience higher level of psychosocial impairment (Kessler et al., 2005) and have worse quality of life (Rapaport et al., 2005) compared to those with only one disorder. Studies have also reported that internalizing and externalizing problems that occur early in life, if left untreated, tend to have a negative course and outcome (Essau, Lewinsohn, et al., 2014).

These findings have led to the development of intervention programs, with cognitive behaviour therapy (CBT) as the treatment of choice. However, almost all intervention programs are disorder specific. Particularly, intervention programs tend to focus on specific type of internalizing problems such as only for anxiety or only for depressive disorders. For anxiety disorders, various types of programs are available for specific types of anxiety disorders such as intervention programs for social anxiety disorder or specific phobias. Up to 65% of the young people have been reported to respond positively to such interventions (Essau et al., 2012; Kendall et al., 1997; Seligman & Ollendick, 2011; Stallard et al., 2007). These moderate remission rates might be attributed to the fact that these studies have been based on interventions that are designed for specific disorders and do not consider the presence of comorbid disorders. In fact, the treatment outcome of adolescents with presence of depressive disorder or depressive symptoms who received treatment for their anxiety disorders had a poorer outcome than those without any comorbid depressive symptoms or disorders (O'Neil & Kendall, 2012).

Given the findings on the high comorbidity both within internalizing problems (e.g., anxiety and depression) and also between internalizing and externalizing problems (e.g., anxiety and conduct problems), disorder-specific intervention programs might not be the most cost-effective way to addresses comorbid problems. Thus, recent years have seen the development of increasing number of interventions that use the transdiagnostic approach. The term "transdiagnostic" refers to intervention programs that address various mental disorders that show common risk factors. Transdiagnostic approaches to intervention have a number of advantages compared to disorder-specific intervention programs. First, given the high rate of comorbidity within internalizing disorders, transdiagnostic approach is more cost-effective because it involves training practitioners/clinicians in one intervention protocol instead of a protocol for each type of disorders (Sauer-Zavala et al., 2016). Second, in routine clinical settings, patients generally have comorbid disorders with heterogeneous manifestations of symptoms, which makes it difficult to select the most appropriate protocols for specific disorders

(Sauer-Zavala et al., 2016). Third, some factors related to the onset and maintenance are common across internalizing and externalizing disorders (Essau & de la Torre-Luque, 2019; de la Torre-Luque & Essau, 2019). From the "shared mechanisms approach" (Sauer-Zavala et al., 2016), it is important to target common factors that underlying comorbid disorders.

A transdiagnostic intervention protocol that has been developed for children and adolescents with internalizing problems (i.e., anxiety and depression) is called "Super Skills for Life" (SSL, Essau & Ollendick, 2013, 2016). SSL has five core principles: (1) it targets common core risk factors (e.g., low self-esteem, lack of social skills) of anxiety and depression, and as such it should be more time efficient and cost-effective than using interventions that focus on only anxiety or depression; (2) it uses principles of CBT to help children and adolescents develop skills to cope with anxiety-provoking situations; (3) it uses video feedback with cognitive preparation to help children and adolescents increases their self-perception (Harvey et al., 2000; Rodebaugh, 2004); (4) it uses the principle of behavioural activation by having children and adolescents increase their activity levels and participate in positive and rewarding activities; such activities can help to improve their mood and overall self-esteem; (5) finally, it teaches children and adolescents basic skills to use during social interactions.

Recent studies have shown that the SSL is effective in reducing emotional problems such as anxiety and depressive symptoms as well as other forms of difficulties such as anxiety-related interferences, and peer and conduct problems among children and adolescents in school settings (Essau, Olaya, et al., 2014; Fernández-Martínez et al., 2020; Orgilés et al., 2020) and in residential care institutions (Ramdhonee-Dowlot et al., 2021). However, studies that examined the role of gender, age, and school type in moderating the intervention outcome is lacking.

Therefore, the aim of our study was to assess the benefit of a transdiagnostic prevention program (Super Skills for Life – adolescent version; SSL-A) to reduce mental health problems among adolescents. The specific objectives were: (1) to examine the effects of the SSL-A in reducing internalizing and externalizing problems in adolescents; and (2) to examine the moderating role of gender, age, and school type on the benefit of the SSL-A. Based on recent promising findings of SSL (Essau et al., 2019; Fernández-Martínez et al., 2020; Orgilés et al., 2020), it was hypothesized that at both post-treatment and six-month follow-up, compared to those in a waitlist-control group, adolescents who participate in SSL-A would demonstrate improvements in internalizing (e.g., anxiety and depressive symptoms) and externalizing (e.g., conduct problems) symptoms. Being female and younger age are expected to moderate the intervention outcome (Essau, Olaya, et al., 2014).

METHOD

Participants

A total of 112 adolescents who were referred by their teacher as having internalizing and externalizing problems participated in this study. The participants were recruited from two high schools (one mainstream school and one Pupil referral unit) in the south-west area of London, UK. Over half (64.3%) of the participants were from the Pupil Referral Unit (PRU) and 35.7% were from the mainstream school. In the UK, PRU is an alternative education provision which is organised to provide education for children and adolescents who need greater care and support than the mainstream school can provide. One of the most common reasons for referral to the PRU is the presence of emotional or behavioural difficulties. In the present study, participants from the mainstream school were considered as community sample, and those from the PRU were considered as a clinical sample.

Sixty-seven (59.8%) were boys and 45 (40.2%) were girls. Their age ranged from 11 to 14 years (M = 12.16, SD = .83). The sample was relatively diverse, 23.7% were White, 43.4% Black or African, 22.2% Asian, and 10.8% other/unreported. About 60.8% of the adolescents live in the community setting, compared to 39.2% of adolescents who live with both parents in the clinical setting. Thus, a higher percentage of clinical samples lived in a single parent family. The percentage of adolescents in the clinical setting who were entitled to free school dinners were about double the percentage of those who live in the community setting.

Measures

The Youth Self Report (YSR; Achenbach, 1991) was used to measure internalizing and externalizing problems. Its 120 problem items can be scored on a 3-point scale, ranging from "0 = not true" to "2 = very or often true", apart from question 56h, which was an open-ended item (i.e., Physical problems without known any medical cause: Other). The participants rated how true each item is now or was within the past six months. The YSR was scored on the scale of the total problems, which was the sum of the scores of each problem item. The problem items were combined to form eight syndrome scales, which were further divided into two broadband scales, namely Internalizing and Externalizing scales. Internalizing problems include emotional disturbances and are made up

of the following subscales: Withdrawn (e.g., "I would rather be alone than with others"), Somatic Complaints (e.g., "I feel dizzy or lightheaded") and Anxious/Depressed (e.g., "I feel lonely"). The Externalizing problems reflect conduct disorders or behavioural excess and were made up of Delinquent Behaviour (e.g., "I don't feel guilty after doing something I shouldn't") and Aggressive Behaviour (e.g., "I am mean to others") scales. Other scales that were assessed were Social Problems (e.g., "I act too young for my age"), Thought Problems (e.g., "I can't take my mind off certain thoughts"), Attention Problems (e.g., "I have trouble concentrating or paying attention"), and Other Problems (e.g., "I don't eat as well as I should"). The YSR has good reliability in the original English version (Achenbach, 1991) and it has been replicated in American, German and Dutch studies of children and adolescents in clinical and epidemiological settings (Ebesutani et al., 2011; Steinhausen et al., 1998; Van Lang et al., 2005). In the current sample, the internal consistency of the YSR was excellent, with Cronbach alpha being .94.

Demographics Scale was used to measure the participant's sociodemographic features such as age, gender, religious affiliation, and ethnicity as well as living arrangement (i.e., whether the participants lived with either or both of their parents).

No data were available of the type of parental employment, and hence, a proxy for socio-economic status (SES) was used instead of the Hollingshead-Redlich Factor. It consisted of a composite index (range 0-6) including single-parent family status (divorced, separated, or widowed), employment for each parent separately, highest education for each parent separately, number of times the family had moved during the study period (with three or more times being a risk factor), and child's free lunch status in school ("Were you entitled to free or help with cost of lunches?"). The adolescents responded to these items by checking "yes" (coded 1) or "no" (coded 0).

The Intervention: Super Skills of Life – Adolescent version (SSL-A)

The SSL-A consists of eight sessions, which are implemented a week for the duration of eight weeks. Each session consists of 45 minutes with on average ten adolescents per treatment group. The content and activities covered in SSL-A are listed in Table 1. The program teaches adolescents to: (1) learn how to live a healthy and balanced lifestyle; (2) build emotional resilience by self-monitoring and adjustment; (3) encourage peer learning and build peer networks; and (4) promote self-confidence and social skills.

Table 1
Contents of the SSL-A

Session	Aims / Activities
Session 1	Introduce the participants to the Super Skills for Life – adolescent version (SSL-A). Discuss behaviours that are related to a healthy lifestyle (i.e., eating healthy food, regular physical activities, enough sleep).
Session 2	Introduce the participants with the concept of self-esteem and to discuss activities that could help to enhance self-esteem. Discuss various small steps that are needed to develop a particular skill.
Session 3	Introduce the participants to the concept of feelings and thoughts.
Session 4	Introduce the concept of the link between thoughts, feelings, and behaviour.
Session 5	Learn about the impact of stress on our body and feelings. Teach the participants specific relaxation strategies.
Session 6	Discuss the importance of having a good relationship. Learn specific skills that are needed to get along with other people.
Session 7	Introduce the participants to the idea of using problem-solving steps in dealing with social problem.
Session 8	Introduce the importance of having a sense of future.

Home activities were given at the end of each session to enable the continued practice of the skills learnt and participants were needed to return completed home tasks in the following sessions. At the beginning of the next session, these tasks were reviewed and discussed. Adolescents who missed a session had to complete an individual session with their trainer before they could join the next group session.

Implementation of the SSL-A

SSL-A was delivered by two facilitators, who were both checked and cleared before starting this program by the Disclosure and Barring Service (DBW). Both facilitators received training by the senior author of SSL-A (CAE) and were equipped with the Facilitator's manual to guide them and ensure consistency in each session (Essau et al., 2014). The manual gives step-by-step instructions on how to implement each session of SSL-A. The instructions clearly outline the main aims and

strategies to be used for each session; the desired outcomes, and the exercises to be used in meeting to attain these outcomes. Adolescents were given a workbook which holds the main messages of each session, exercises, activities, role plays and homework. The workbook was used to re-enforce the in-class lessons and enable the participants to refer to them to implement the skills in real life situations.

The group meeting with the facilitators and the senior author of SSL-A was conducted after each session to discuss if the level of engagement and if the home activity was completed and any other relevant feedback on each session.

Procedure

Ethical approval was obtained from the Ethical Board of the University of Roehampton before conducting the present study. Two schools in South East London were recruited via an email invitation explaining the purpose and procedures of the current study. All parents were provided with a letter of invitation explaining the study followed by an opt-out consent form, which they were asked to complete only if they did not want their children to participate. The opt-out consent forms informed parents/participants that the purpose of the study was to further our understanding of the nature of internalizing and externalizing problems and how it can affect their cognition, emotional state, and their social skills. Parents were informed that their children would be taught specific skills that they could use to better cope with challenging situations.

The adolescents were randomly allocated to either the intervention (n = 55, 49.1%) or a waitlist control group (WLC) (n = 57, 50.9%). Adolescents in the intervention group participated immediately in the SSL-A, whereas adolescents in the WLC group received the intervention approximately eight months later (i.e., after the intervention group completed the six months follow-up assessment).

The adolescents completed the same questionnaires one week before and one week after participating in SSL-A, and six months after the last session of SSL-A, within school hours. Adolescents in the WLC also completed the same questionnaires at the same interval as the adolescents in the intervention group.

Data analyses

Initially, descriptive statistics were calculated for both the WLC and intervention group detailing means and standard deviations before (T1), after (T2), and six months after the completion of the program (T3). A series of factorial repeated measure

ANOVAs were conducted to determine the effect of SSL-A on internalizing problems (i.e., withdrawn, somatic complains, anxious/depressed) and externalizing problems (i.e., delinquent problems and aggressive behaviour). The effect of the SSL-A on groups' other problems such as social problems, thought problems, attention problems and YSR problems were also assessed. A series of factorial repeated measure ANOVAs were also conducted for the intervention group data on internalising problems, externalising problems, and other problems to identify whether age, gender, and setting (clinical or community) acted as moderators for change in pre- to follow-up test scores.

RESULTS

Table 2 shows the means and standard deviations of the study variables (internalizing and externalizing problems) for adolescents in the intervention and control groups. A series of factorial repeated measure ANOVAs showed significant interactions between time (pre- and post-test, follow-up) and group (intervention, WLC) were found for total internalizing problem, $F(2, 104) = 8.58$, $p < .001$, and somatic complaints, $F(2, 109) = 17.92$, $p < .001$. Specifically, follow-up score was significantly lower ($p < .001$) than post-test score on internalizing syndrome. Similarly, follow-up score was significantly lower ($p < .001$) than post-test score on somatic complaints. Significant interaction was also found on withdrawn, $F(2, 109) = 13.4$, $p < .001$; and anxious/depressed ($F(2, 104) = 2.63$, $p < .001$) subscales.

Significant interactions were also found between time (pre- and post-test, follow-up) and group (intervention, WLC) for total externalizing problems, $F(2, 104) = 8.58$, $p < .001$, and aggressive behaviour, $F(2, 104) = 5.54$, $p < .001$. Specifically, follow-up score was significantly lower ($p < .001$) than both post-test and pre-test scores on total externalizing problems and on aggressive behaviour. However, no significant interaction effect was found on delinquent behaviour, $F(2, 109) = 2.96$, $p > .001$.

Further analyses showed significant interactions between time (pre- and post-test, follow-up) and group (intervention, WLC) for total Other Problems such as thought problems score, $F(2, 109) = 9.21$, $p < .001$; attention problems, $F(2, 109) = 10.47$, $p < .001$; YSR problems score, $F(2, 104) = 26.26$, $p < .001$. Multiple comparison using Bonferroni used for the dependent variables that showed interaction effect (Group X Time) showed that follow-up score was significantly lower ($p < .001$) than both post-test score and follow-up scores on thought problems. Similarly, on attention problem, follow-up scores were found significantly lower than post-test scores ($p = .001$) and pre-test scores ($p = .001$). Results regarding YSR total problem, follow-up score was found significantly lower than post-test scores ($p < .001$) and pre-test scores ($p = .001$).

Table 2
Internalising and externalising problems at pre- and post-test and at follow-up

YSR Syndromes	Pre-test Mean (*SD*)	Post-test Mean (*SD*)	Follow-up Mean (*SD*)
Internalizing Problems (total)	9.28 (6.63)	9.82 (6.51)	8.85 (6.03)
Intervention group	9.94 (6.72)	9.42 (5.76)	8.52 (5.52)
Control group	8.70 (6.55)	10.17 (7.14)	9.15 (6.48)
Withdrawn	1.96 (1.92)	1.89 (1.99)	1.91 (1.87)
Intervention group	1.92 (1.86)	1.83 (1.96)	1.85 (1.69)
Control group	2.00 (2.00)	1.94 (2.03)	1.98 (2.05)
Somatic Complaints	2.47 (2.41)	3.87 (2.34)	2.78 (2.33)
Intervention group	3.18 (2.08)	3.09 (1.82)	2.32 (2.09)
Control group	2.47 (2.41)	3.87 (3.34)	2.78 (2.33)
Anxious/Depressed	4.50 (4.09)	4.38 (3.71)	4.38 (3.67)
Intervention group	4.82 (4.34)	4.42 (4.49)	4.38 (3.46)
Control group	4.22 (3.88)	4.35 (3.93)	4.38 (3.88)
Externalizing Problems (total)	9.39 (6.11)	8.96 (5.86)	8.84 (5.85)
Intervention group	10.20 (6.18)	9.44 (5.83)	9.28 (5.84)
Control group	8.68 (6.02)	8.54 (5.90)	8.45 (5.87)
Delinquent Problems	2.58 (2.16)	2.55 (2.11)	2.44 (2.10)
Intervention group	2.52 (2.04)	2.41 (1.95)	2.27 (1.92)
Control group	2.63 (2.29)	2.68 (2.26)	2.61 (2.25)
Aggressive Behaviour	6.78 (4.71)	6.38 (4.43)	6.36 (4.42)
Intervention group	7.62 (4.91)	6.98 (4.51)	6.96 (4.49)
Control group	6.05 (4.44)	5.85 (4.33)	5.84 (4.32)
Other problems			
Social Problems	3.11 (2.25)	2.83 (2.10)	2.85 (2.11)
Intervention group	3.36 (2.49)	2.87 (2.11)	2.89 (2.16)
Control group	2.87 (1.98)	2.79 (2.10)	2.82 (2.08)
Thought Problems	3.12 (2.54)	2.83 (2.35)	2.70 (2.28)
Intervention group	3.14 (2.54)	2.60 (2.11)	2.40 (1.99)
Control group	3.10 (2.56)	3.07 (2.56)	3.00 (2.51)
Attention Problems	3.83 (2.29)	3.53 (2.13)	3.57 (2.12)
Intervention group	3.78 (2.38)	3.14 (1.93)	3.18 (1.94)
Control group	2.87 (2.22)	2.91 (2.27)	2.94 (2.24)
YSR Problems (total)	35.80 (19.20)	34.48 (17.75)	33.28 (17.39)
Intervention group	37.78 (20.54)	33.64 (17.29)	32.26 (17.13)
Control group	34.07 (17.95)	35.22 (18.26)	34.17 (17.72)

Moderators for change of symptoms

The next step of our analysis was to examine the moderating role of gender, age, and school type on the intervention outcomes (i.e., reducing internalizing and externalizing problems, other problems) from pre- to follow-up-test using a series of factorial repeated measure ANOVAs.

Internalizing problems: There was a significant interaction between time and gender, $F(2, 47) = 3.27$, $p < .05$, on internalizing problems. Specifically, among males, follow-up test scores were significantly lower than post-test ($p = .006$) and pre-test scores ($p = .006$). A significant age and time interaction was also found on internalizing problems, $F(4, 92) = 3.50$, $p < .05$. Specifically, follow-up scores of the 13-olds were significantly lower than post-test ($p = .002$) and pre-test scores ($p = .012$). A significant school type and time interaction was also found on internalizing problems, $F(2, 47) = 4.96$, $p < .05$. Specifically, mainstream school follow-up scores were significantly lower than post-test ($p = .002$) and pre-test scores ($p = .005$).

Externalizing problems: There was a significant interaction between time and gender, $F(2, 47) = 6.93$, $p < .05$, on externalizing problems. Among males, follow-up scores were significantly lower than post-test ($p < .001$) and pre-test scores ($p < .001$). A significant age and time interaction were also found on externalizing symptoms, $F(4, 94) = 5.85$, $p < .05$. Specifically, among 12 years old, follow-up scores were significantly lower than post-test ($p < .001$) and pre-test scores ($p < .001$). A significant school type and time interaction was also found on externalizing problems, $F(2, 47) = 6.31$, $p < .05$. This finding suggested that at follow-up, the externalizing problems scores among adolescents from mainstream school were significantly lower than post-test ($p < .001$) and pre-test scores ($p < .001$).

Other Problems: There was no significant interaction between time and gender, $F(2, 52) = 3.13$, $p > .05$, on other problems. A significant age and time interaction was found on other problems, $F(4, 104) = 8.82$, $p < .05$, suggesting that among the 12 years old, follow-up scores were significantly lower than post-test ($p < .001$) and pre-test scores ($p < .001$). No significant interaction was found between school type and time on other problems, $F(2, 52) = 1.25$, $p > .05$.

DISCUSSION

The aims of the present study were to examine the effects of the SSL-A in reducing internalizing and externalizing problems in adolescents, and to exam-

ine the extent to which gender, age, and school type moderate the intervention outcome. To our knowledge, this is the first study to have used SSL-A in both mainstream school and in pupil referral unit, and to have focussed on internalizing and externalizing problems. The study took place in the natural environment, i.e., within the school setting, which ensured that adolescents with internalizing and externalizing problems did received an evidence-based intervention (Meltzer et al., 2000). In particular, a high proportion of the adolescents in PRU have parents from single parents and "dysfunctional" family situations who are unwilling to engage in evidence-based intervention, so the school-based intervention approach may be an important option (Gottfredson et al., 2000). As argued by Wilson and Lipsey (2007), a program that is delivered to all students in a classroom can be accessed by the highest number of students targeting multiple internalizing and externalizing problems at the same time.

The findings could be summarised as follows: first, as hypothesized and in line with previous studies (Essau, Olaya, et al., 2014, 2019; Fernández-Martínez et al., 2020; Orgilés et al., 2020; Ramdhonee-Dowlot et al., 2021), total internalizing problems were significantly reduced from pre-test to follow-up assessments. Within the internalizing problems, significant reductions were found for somatic complaints, withdrawn and anxious/depressed subscales. The finding on the reduction in somatic complaints at follow-up is interesting because previous studies have shown a high comorbidity between somatic complaints and internalizing problems (Essau et al., 2013). Within the externalizing problems, significant reduction was found for aggressive behaviour, which replicated the previous study by Essau, Olaya et al. (2014). This is an important finding because, although SSL was designed to target internalizing problems, it also had positive effects on externalizing problems as well. By using the transdiagnostic approach, SSL-A targets low self-esteem and social skills which are common among young people with internalizing and externalizing problems (Barry et al., 2003; Glass et al., 2011). It could be speculated that these adolescents benefit from SSL-A as it contains activities that help to enhance their self-esteem and social skills, and thus in turn may have a positive impact on externalizing problems.

Second, sociodemographic factors such as gender and age moderated the intervention outcome. Gender showed a significant interaction between time and group, whereby males showed a significant reduction over time on both internalizing and externalizing problems after the intervention. The effect of gender in internalizing problems was inconsistent with some previous studies. For example, studies that used the FRIENDS program reported that both girls and boys uniformly benefited from the intervention (Essau et al., 2012; Lowry-Webster et al., 2003). The reason for this inconsistent finding was unclear although it could

be attributed to the fact that in the present study there were more boys than girls, whereas in the two previous studies, there were more girls than boys. By contrast, the moderating effects of gender on behaviour found in this study is in line with previous research (Kendall & Choudhury, 2003) whereby boys showed a reduction over time on behaviour problems greater than girls after the SSL-A intervention. Our finding also showed age to be a moderating factor of change for internalizing and externalizing problems; younger compared to older adolescents displayed significant benefits of SSL-A. Similar findings have been reported in previous studies (Essau et al., 2012; Kendall & Choudhury, 2003), which might suggest that at younger age, the problems are not as severe as in older age and, thus, they might be faster to see the impact of the intervention. Future studies are needed to test this hypothesis.

Third, school type (mainstream or PRU) and time (pre- and post-test and follow-up) together had a moderating effect on both internalizing and externalizing problems. Specifically, mainstream school on follow-up test scores was significantly lower than post-test and pre-test scores. This finding is interesting and may be related to the adolescents in PRU who have been removed from the mainstream schools due to externalizing and/or internalizing problems, and many come from a dysfunctional family environment.

In interpreting our findings, it is important to take into account the study's limitations. First, the sample size was small. Thus, more studies are needed with a larger sample size. Second, the study did not use any structured diagnostic interviews because it was implemented in a school setting with limited human resources. However, the study did use the YSR to measure internalizing and externalizing problems in adolescents which has proven to be both valid and reliable in distinguishing adolescents with and without any mental health problems (Achenbach & Rescorla, 2001). Third, participants were recruited from two schools. To have a diverse group of adolescents, future studies should consider including more schools.

These limitations notwithstanding, our findings suggest that future studies should consider the inclusion of this program in school settings as a taught lesson for all in Personal, Social, Health and Economic (PSHE) Education, as a valuable practice for the reduction of the development and maintenance of internalizing and externalizing problems. PSHE is a school subject being taught in England through which young people learn to develop the knowledge, skills and attributes to keep them healthy and safe and to prepare them for life. Additionally, Child and Adolescent Mental Health Services (CAMHS) could use the SSL-A as an entry point for the treatment of all non-urgent presentations to enable better management of the extensively long wait lists for treatment within CAMHS.

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Neuropsychological deficits in internalizing and externalizing disorders:
Implications for improving cognitive-behavioral therapy in children and adolescents • pág. 69-92
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Neuropsychological deficits in internalizing and externalizing disorders: Implications for improving cognitive-behavioral therapy in children and adolescents

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Abstract

Over the past three decades, our understanding of the nature, assessment and treatment of childhood mental disorders has increased significantly. Some of the most recent advances come from transdiagnostic and neuropsychological-based approaches. While the relationship of similar neuropsychological deficits with some mental disorders, such as neurodevelopmental and severe mental disorders like schizophrenia or bipolar disorder, is widely established, there is more controversy about their relationship with the so-called internalizing and externalizing disorders. In this article, our goal was to highlight the potential of incorporating cognitive strategies from integrative neuropsychological and transdiagnostic approaches to improve the effectiveness of empirically-supported cognitive-behavioral therapy for internalizing and externalizing mental disorders in childhood and adolescence. The results of the present work indicate that the vast majority of internalizing disorders, including the presence of anxiety, depressive, trauma- and stress-related, and obsessive-compulsive and related disorders, as well as externalizing symptoms (corresponding to conduct disorder and ODD), present neuropsychological deficits and that their consideration may be relevant to improve the effectiveness of psychotherapeutic interventions in children and adolescents by incorporating neuropsychology-based assessment and treatment tools. The inclusion of neuropsychological support strategies in therapy for childhood mental disorders implies an advance and has clear implications for the enhancement of psychological care for childhood mental disorders.

Keywords: neuropsychology, mental disorders, internalizing, externalizing, children and adolescents.

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Défices neuro-psicológicos nas perturbações internalizantes e externalizantes: Implicações para aumentar a eficácia das intervenções cognitivo-comportamentais em crianças e adolescentes

Resumo

Ao longo das últimas três décadas, a nossa compreensão da natureza, avaliação e tratamento das perturbações mentais na infância aumentou significativamente. Alguns dos avanços mais recentes derivam de abordagens transdiagnósticas e neuropsicológicas. Embora a relação de défices neuropsicológicos com algumas perturbações mentais, como as perturbações neurodesenvolvimentais e perturbações mentais graves, como a esquizofrenia e a perturbação bipolar, seja amplamente reconhecida, existe maior controvérsia acerca da sua relação com as perturbações internalizantes e externalizantes. Este artigo teve como objetivo destacar o potencial de incorporar estratégias cognitivas derivadas de abordagens transdiagnósticas neuropsicológicas integradoras para aumentar a eficácia de tratamentos cognitivo-comportamentais empiricamente validados para perturbações internalizantes e externalizantes na infância e na adolescência. Os resultados do presente trabalho indicam que tanto a vasta maioria de perturbações internalizantes (incluindo perturbações de ansiedade, perturbações depressivas, perturbações relacionadas com trauma e fatores de stress, e perturbações obsessivo-compulsivas e relacionadas) como perturbações externalizantes (como perturbação do comportamento e perturbação desafiante de oposição), apresentam défices neuropsicológicos, e que a consideração destes défices pode ser relevante para melhorar a eficácia de intervenções psicoterapêuticas com crianças e adolescentes, incorporando ferramentas neuropsicológicas de avaliação e tratamento. A inclusão de estratégias neuropsicológicas de suporte na intervenção terapêutica para as perturbações mentais infantis implica um avanço e tem implicações claras na melhoria de cuidados psicológicos a esta população.

Palavras-chave: neuropsicologia, perturbações mentais, internalizantes, externalizantes, crianças e adolescentes.

INTRODUCTION

The global prevalence for mental disorders in children and adolescents ranges from 6% to 20% and is clearly increasing. For example, Erskine et al.'s (2017) study reported a mean global prevalence of 6.7% for mental disorders in ages 5-17 years, whereas Polanczyk et al. (2015) reported a worldwide-pooled prevalence of mental disorders of 13.4% (95% CI [11.3, 15.9]). Specifically, the prevalence for anxiety

disorders worldwide is about 6.5% (95% CI [4.7, 9.1]), 2.6% (95% CI [1.7, 3.9]) for any depressive disorder, 3.4% (95% CI [2.6, 4.5]) for attention deficit hyperactivity disorder (ADHD), and 5.7% (95% CI [4.0, 8.1]) for any disruptive, impulse control, or conduct disorder (Polanczyk et al., 2015). Erskine et al. (2017) reported rather similar prevalence rates: anxiety: 3.2%; depression: 6.2%; ADHD: 5.5%; and conduct disorder: 5.0%. Furthermore, these prevalence rates differ according to gender, as anxiety disorders are more common among girls, and ADHD among boys, and girls have a greater risk for developing schizophrenia, obsessive-compulsive disorder (OCD), and mood disorders (Dalsgaard et al., 2020).

All these data indicate that mental disorders affect a significant number of children and adolescents worldwide. This high rate is even more alarming when we realize that children and adolescents up to the age of 19 represent one third of the world's population (United Nations [UN], 2019). If left unchecked, these problems can severely influence children's development and, consequently, a society that is aging as a whole (Kassebaum et al., 2017; UN, 2019).

The most common practice in the study of childhood mental disorders has been to extrapolate adult models of psychopathology, assessment, and treatment to children. However, developing children represent a unique population for which there are different conceptual, methodological, and practical considerations regarding psychopathology, classification, assessment, diagnosis, and treatment.

In recent years, and partly motivated by this high prevalence, our understanding of the nature, assessment, and treatment of childhood mental disorders has increased markedly, as indicated by the publication of numerous specific manuals (e.g., Lasprilla et al., 2018; Ollendick et al., 2018).

One of the advances with considerable empirical support has been the knowledge of which treatments for mental disorders are effective, with several meta-analytic and umbrella reviews indicating medium to large effect sizes (e.g., Andersson et al., 2019; David et al., 2018). However, these and other studies indicate that psychological treatments of mental disorders for children have been subordinate and dependent on those implemented in adults, so this assumption has made it difficult to obtain greater evidence of the effectiveness of psychological treatments in children and adolescents from a scientific point of view (Cano-Vindel & Moriana, 2018).

Among the treatments with the most empirical support in the treatment of mental disorders for children and adolescents are those with a cognitive-behavioral and psychoeducational approach, which is considered the first-line treatment (Bekker et al., 2017). However, the effect sizes on outcomes are smaller compared to other interventions: between small and medium for depression and post-traumatic stress disorder, medium for anxiety, and large for OCD (David et al., 2018; Galvez-Lara et al., 2018); there is a considerable percentage of children and adolescents who

do not benefit from the interventions (i.e., between 30-40% for the treatment of childhood anxiety disorders according to Sandin et al., 2018) and the limited scope of psychotherapy (Jorm et al., 2017).

Consequently, this implies considering advances from clinical child psychology and child and adolescent psychiatry and from related disciplines that, through complementary or coadjutant interventions, allow improving the effectiveness of Cognitive-Behavioral Therapy (CBT). Two advances deserve more attention: the transdiagnostic approach for the treatment of mental disorders and the neuropsychological approach applied to child clinical psychology.

In this manuscript, we present, from a neuropsychological approach, a review of the present neuropsychological deficits and the therapeutic strategies that can be effective to improve and complement the CBT of internalizing (anxiety, depression, post-traumatic stress, obsessive-compulsive and related disorders) and externalizing (exclusively, conduct and ODD) disorders in childhood and adolescence. Consequently, this paper aims to describe and discuss the implications of neuropsychological alterations or deficits present in internalizing and externalizing disorders in children and adolescents in order to improve cognitive-behavioral therapy. Thus, it will focus on analyzing the following aspects from a neuropsychological approach: a) some of the latest advances in explanatory models that explain the presence of these deficits and that can improve psychological therapies; b) neuropsychological deficits according to the disorder or predominant symptoms; and c) the main therapeutic strategies that can be effective to improve and complement the more traditional CBT of mental disorders in childhood, especially internalizing and externalizing disorders.

ADVANCES FROM CLINICAL CHILD PSYCHOLOGY AND RELATED DISCIPLINES THAT CAN IMPROVE PSYCHOLOGICAL THERAPY

In psychopathology and clinical psychology, there is still controversy about which diagnostic approach best fits mental disorders: dimensional (e.g., Achenbach, 1985) versus categorical (e.g., Diagnostic and Statistical Manual of Mental Disorders, 5th edition - DSM-5, American Psychiatric Association [APA], 2013). Therefore, the categorical approach to psychopathology considers that there are specific mental disorders that can be well defined by a set of symptoms, specific to each disorder (Cano-Vindel & Moriana, 2018). On the other hand, the dimensional approach states that the disorders themselves are really independent dimensions or behavioral traits, and that all children have them in different degrees, grouping them

in two large blocks: problems due to a low control or externalizing problems, and problems due to a high control or internalizing problems, following Achenbach's classification (1985). Thus, on the one hand, internalizing symptoms correspond to manifestations of anxious, depressive, and somatic problems, as well as problems of withdrawal. Consequently, anxiety, depression, stress- and trauma-related and obsessive-compulsive and related disorders, according to DSM-5 criteria (APA, 2013), have been included in this review. On the other hand, we included externalizing symptoms, which refer to problems related to aggressive behavior, disobedience, and criminal judicial behavior corresponding to conduct disorder and ODD, following the DSM-5 classification (APA, 2013).

A third block would be the combined syndromes, which include social, thinking, and attention problems. Some of the problems of the categorical approach are the excessive increase of diagnostic categories and the high comorbidity, which may imply limited validity for these disorders. The dimensional model has also received criticism and, as a main disadvantage, is less pragmatic and less clear for its application in the clinic (Sandin et al., 2012).

Transdiagnostic perspective

In this context, an integrative alternative to the two classical models has emerged, the "transdiagnostic" approach to psychological emotional problems, a relatively new approach that starts from a comprehensive conception of the symptoms that several disorders have in common. Although the term transdiagnostic was initially used by Fairburn et al. (2003) in the field of eating disorders, its use has spread to other disorders, primarily internalizing disorders (depressive, anxiety, and somatization disorders), where many of the symptoms that appear in the course of these problems are common to each other and would explain the high comorbidity between them. From the psychopathological point of view, transdiagnostic approach consists of understanding mental disorders on the basis of a range of etiopathogenic cognitive and behavioral processes that are common to most mental disorders (Sandin et al., 2012).

The main application of these models has been the development of interventions to improve the effectiveness of psychotherapy. Transdiagnostic treatments can be applied both in individual and group formats, and usually include a first component focused on psychoeducation about emotions and factors involved in emotion regulation, especially the role of cognitive distortions (magnification, over-attention, rumination) and the use of avoidance or similar anxiety-reducing behaviors. Its effectiveness has been widely demonstrated in adults and young

people, and adaptations are currently being made for children (Cano-Vindel & Moriana, 2018; Garcia-Escalera et al., 2016). Thus, several studies have found that unified transdiagnostic protocols for anxiety and mood disorders were as effective as specific treatments in terms of symptom improvement, although they additionally achieve improvement in the symptoms of comorbid disorders and in a more efficient way (Garcia-Escalera et al., 2016; Mansell, 2019; Newby et al., 2015).

Neuropsychological perspective

Until relatively recently, psychopathology and clinical psychology versus neuropsychology had walked in separate, reductionist and mutually exclusive fields of knowledge. However, in the last 15 years, some authors have advocated the integration of the two fields of knowledge to improve intervention in mental disorders (Harvey et al., 2014; Harvey et al., 2004; Tirapu-Ustarroz, 2011; Tirapu-Ustarroz & Muñoz-Cespedes, 2004).

This integration of clinical psychology and neuropsychology could favor the effectiveness of clinical interventions by examining the cognitive deficits related to mental disorders to determine the impact of these deficits on functional aspects of behavior and, on the other hand, by describing these deficits so as to enable intervening in them to improve the person's health and well-being. In this way, mental disorders could be explained in terms of structural or functional alterations of brain activity (neuropsychology of mental disorders) and provide clinical psychology with a discourse more in line with our current knowledge of the brain (Tirapu-Ustarroz & Muñoz-Cespedes, 2004).

Several authors have pointed out the interest in incorporating knowledge about neuropsychology to improve the assessment and treatment of mental disorders (Tirapu-Ustarroz, 2011; Tirapu-Ustarroz & Muñoz-Cespedes, 2004). Thus, various studies focusing on the neuropsychology of mental disorders coincide in pointing out the existence of neuropsychological alterations in different mental disorders, such as the so-called neurodevelopmental disorders (APA, 2013, pp. 31-32; Thapar et al., 2017) and, in severe mental disorders, such as schizophrenia, bipolar disorder, and some personality disorders such as antisocial personality disorder (APA, 2013; Bedoya-Tovar et al., 2011; Frias et al., 2015; Tirapu-Ustarroz & Muñoz-Cespedes, 2004).

However, there is more controversy about the relationship and role of neuropsychological deficits in internalizing or emotional disorders, such as anxiety or depression, and in purely externalizing disorders, such as conduct disorders.

NEUROPSYCHOLOGICAL CHARACTERISTICS OF MENTAL DISORDERS

As pointed out above, the idea of incorporating the advances of neuropsychology into child psychotherapy has emerged recently. Thus, child or developmental neuropsychology is a field of research that has been expanding rapidly in recent decades. It is a discipline of behavioral neuroscience that studies the relationships between behavior and the developing brain in order to apply scientific knowledge of these relationships to evaluate and compensate the consequences of brain injuries produced in childhood (Portellano, 2007). The characteristics and typical neurocognitive profiles of different mental disorders can help to identify a problem and design the best possible interventions.

The main cognitive functions that can be considered in child neuropsychological assessment are those listed below in Tables 1 and 2. Table 1 describes the main cognitive functions that can be assessed following Portellano (2007, chap. 11), and Table 2 describes the executive functions (EFs) according to the model proposed by Tirapu-Ustarroz et al. (2017, 2008, 2005).

Table 1
Definition of some of the main cognitive functions

Function	Description	Involved brain areas
Intelligence (IQ)	General capacity of the person to act with a purpose, to think rationally and to interact effectively with his/her environment; capacity of abstraction and reasoning; includes both the verbal comprehension factor and perceptive reasoning; index of general capacity or G-factor of intelligence (resistant to deterioration and stable over time); includes crystallized, fluid.	Multiple neural networks, with special emphasis on the prefrontal cortex (PFC)
Attention	Mental ability to select stimuli, responses, memories, or thoughts that are relevant, focus on them, and ignore those that are not; different types are recognized, such as alert, focused, sustained (vigilant), selective, alternating, or split.	Reticular system; posterior and anterior attentional system (PFC and subcortical); white substance; frontoparietal circuit
Processing speed	Rhythm with which the brain processes information.	White substance; frontoparietal circuit

Table 1
Definition of some of the main cognitive functions (cont.)

Function	Description	Involved brain areas
Memory	Ability to enter, record, store, and retrieve information from the brain, whether values or visual or auditory memories, basic to learning and thinking; impression, retention, and reproduction of a previous experience; ability to retrieve previously learned information at a given time; includes different types: verbal memory (remembering words, stories, etc.) or visual memory (remembering images, figures, etc.).	Temporal cortex
Perceptual organization	Ability to integrate perceptual information.	Parietal cortex
Sensory perceptual (gnosis)	Visual, auditory, and tactile functions.	Cortex (behind Rolando's fissure: parieto-temporal-occipital association areas)
Motor	Gross and fine motor skills, execution of praxis, muscle tone, motor fluidity, and balance.	Cerebral, subcortical, and cerebellar cortexes
Language	Expressive language, understanding, repetition, naming, pragmatics, reading and writing.	Left frontal and temporal cortex
Affective-Behavioral	Emotional, personality, and behavioral problems.	Limbic system (amygdala, hippocampus); limbic-cortical connections; and PFC (dorsolateral, cingulate and orbitofrontal)
Executive functions	Set of cognitive functions that allow us to organize behavior to reach a goal, adapting to the changes and demands of the environment.	Frontal cortex (dorsolateral, cingulate and orbitofrontal), among other structures

Table 2
Model of executive functions (based on the proposed protocol for the evaluation of executive functions by Tirapu-Ustarroz et al., 2017, 2008, 2005)

Function and description	Subfunctions	Involved brain areas
Processing speed*: amount of information that can be processed per unit of time, or speed at which a series of cognitive operations can be performed.		White substance; frontoparietal circuit
Working memory:** ability to keep information online in the mind and to manipulate it, operate on it, repeat it...	Phonological loop (immediate verbal memory)	Posterior parietal cortex
	Visuospatial sketchpad (immediate visual memory)	Left temporal cortex
Supervisory Attentional System (SAS) or Central Executive System (CES): is activated when a situation is recognized as novel or non-routine, so it is necessary to put into action executive processes of anticipation, goal selection, planning, and monitoring.	Coding and maintenance (when "slave systems" are saturated they go into action)	Dorsolateral prefrontal cortex (DPFC)
	Maintenance and updating (ability of SEC/SAS to update and maintain information)	Ventrolateral prefrontal cortex (VPFC)
	Maintenance and handling (ability of SEC/SAS to maintain and manipulate information)	DPFC
	Dual performance (performing two tasks simultaneously, usually one verbal and one visuospatial)	DPFC; Medial frontotemporal cortex (MFTC)
	Inhibition (ability to inhibit irrelevant stimuli or control interference and distractors). Tasks measuring response inhibition/ inhibitory control may detect inhibition problems, as does increased reaction time	Anterior cingulate cortex; orbital PFC; inferior frontal gyrus

Table 2
Model of executive functions (based on the proposed protocol for the evaluation of executive functions by Tirapu-Ustarroz et al., 2017, 2008, 2005) (cont.)

Function and description	Subfunctions	Involved brain areas
	Semantic and phonological access (through verbal and picture fluency tasks), the ability to access the retrieval of information from semantic memory and the activation of executive processes to perform appropriate strategies to seek words.	Right DPFC; right MFTC
	Cognitive alternation or flexibility (includes processes of maintenance, inhibition and updating of cognitive sets or criteria)	DPFC; Medial Prefrontal Cortex (MFPC); Supramarginal gyrus; corpus striatum
	Branching or multitasking paradigms (process that integrates working memory and attention resources to achieve activities of greater complexity than dual or other tasks)	Rostral pole (area 10)
Planning: includes good functioning of working memory and SAS/CES functions, setting a goal, carrying out a mental test, applying the chosen strategy and assessing whether or not the intended objective has been achieved. It includes planning, programing, and self-regulation.		Right DPFC; posterior cingulate cortex, basal ganglia
Decision-making: integration of reasoning processes with emotional states to make appropriate decisions		Ventromedial PFC; DPFC; Insula; Amygdala

* It would not be considered a cognitive process as such, but rather a property of the system (Tirapu-Ustarroz et al., 2017).
** Although the working or operational memory cannot be considered an "executive process", it is closely related to these processes, as they are "slave" systems that provide information to the supervisory care system or central executive system to work with that information.

It is worth mentioning that there seem to be altered patterns of cognitive functioning in all disorders, regardless of whether the more general or more specific psychopathological dimensions are considered (see the Supplemental document with the list of studies considered in this review). Overall, the relationship that has received the most empirical support is that which refers to the existence of problems or deficits in EFs in the group of externalizing problems (Oré-Maldonado, 2018) versus the group of internalizing problems or both types of symptoms (Johnson, 2014).

Among the studies linking EFs and externalizing behaviors, Oré-Maldonado (2018) concluded that the worse the performance in inhibitory control tasks, the more dissociative behaviors were found. In Spain, Romero et al. (2016) found a relationship between higher aggressive behavior and poorer performance in executive tasks. Children with oppositional defiant disorder (ODD) show poorer performance in graphic skills, linguistic comprehension, metalinguistic skills, conceptual skills, deferred verbal memory, verbal fluency, cognitive flexibility and planning-organization (Fonseca-Parra & Rey-Anacona, 2013).

On the other hand, internalizing disorders in children and adolescents have been largely forgotten in the main manuals of child neuropsychology. In part, this has been due to the fact that they are not considered neurodevelopmental disorders with clear neurological determinants. However, there is sufficient accumulated scientific evidence to justify the importance of neuropsychology in these problems, although to a lesser extent, and there are also studies that contradict the significant relationship between internalizing symptoms and neuropsychological deficits (Argumedos et al., 2018; Favre et al., 2008; Utria et al., 2011; Vilgis et al., 2015).

A recent study highlights that several neurodevelopmental disorders, even though they are independent diagnostic entities, share common manifestations to those presented by people with brain damage or dysfunction in the prefrontal cortex. The problems that share these manifestations include child abuse, behavioral disorders, and also anxiety disorders (Herreras et al., 2019).

Lundy et al. (2010) found significant negative correlations between anxiety/depression symptoms and general intellectual function, language, visual construction skills, attention, processing speed, executive functioning skills, aspects of learning and memory, psychomotor coordination, and basic academic skills. There are currently many studies exploring EF deficits in internalizing disorders. A recent review has established relationships between deficits in cognitive flexibility and verbal memory and symptoms of anxiety and depression (Iorfino et al., 2016). Mullin et al. (2020) revealed a relationship between the most deficient EF skills reported by parents and the severity of anxiety and depression symptoms, as well as of externalizing symptoms. In the same line, Nelson et al. (2018) concluded that early EF deficits may be an important risk factor for the development

of internalizing psychopathology in childhood. Consequently, it can be concluded that the assessment of neuropsychological performance should be considered in those children who manifest anxious and/or depressive symptoms.

Specifically regarding depression, a recent meta-analytic review found cognitive deficits such as phonemic verbal fluency, sustained attention, verbal memory and planning in children and adolescents with major depressive disorder (MDD) (Wagner et al., 2015). Depressed children and adolescents have EF problems (Evans et al., 2016), problems with EFs and impulsivity (Maalouf et al., 2011), EFs, processing speed, and memory (Brooks et al., 2010), attention, semantic and logical memory problems (Delgado & Valencia, 2012), problems with EFs and attention and working memory (Baune et al., 2012; Baune et al., 2014), and problems with attention and emotional reactivity (Bloch et al., 2013). Depressed adolescents also show deficits in attention (Günther et al., 2011) and memory (Afzali et al., 2018; Matthews et al., 2008). Franklin et al. (2009) also reported the association between visuospatial working memory and dysthymic disorder in pre-pubertal children. All these results highlight the importance of EFs in adolescent depression, and more generally, in adolescent psychopathology (Holler et al., 2014; Kavanaugh & Holler, 2014).

With regard to anxiety disorders in children and adolescents, anxiety symptoms may be associated with reduced language skills and cognitive flexibility (Toren et al., 2000). In a recent study, Franklin et al. (2018) indicated that high anxiety was associated with reduced self-regulatory EFs. In panic disorder, reviews indicate that there is some evidence that people with panic have problems with short-term memory (O'Sullivan & Newman, 2014). Regarding social phobia, patients show deficits in visual (Vasa et al., 2007) and verbal memory (O'Toole & Pedersen, 2011). The visuospatial attention deficits for the obsessive-compulsive disorder (OCD) group are partially consistent with studies of OCD in adults indicating deficits in visuospatial memory (Chang et al., 2007; Martínez-González & Piqueras, 2008). Additionally, children with OCD have deficits in cognitive flexibility and planning ability (Ornstein et al., 2010), and in EFs and visual memory (Lewin et al., 2014). In contrast, in a recent meta-analytic review, Abramovitch et al. (2015) indicate that young people with OCD do not exhibit significant neuropsychological deficits.

In stress- and trauma-related disorders, the cognitive profile of people who have had PTSD is controversial, as it is not clear whether the memory deficits can be attributed to stress-related disorders or are simply cognitive deficits (Bandelow et al., 2017). In a recent study, Barzilay et al. (2019) found that exposure to post-traumatic stress in young people from non-clinical populations is substantially associated with more severe psychopathology and neurocognitive deficits in all domains, beyond PTSD and depression. In the same vein, Li et al. (2019) confirmed the correlation between PTSD and executive dysfunction in children, even after

considering possible individual differences. A meta-analysis concluded general deficits in EFs in trauma-exposed children and adolescents compared to healthy controls. They also found poorer cognitive performance than controls in general, verbal, and visuospatial intelligence, information processing, learning and memory skills (Malarbi et al., 2016).

EVIDENCE IN FAVOR OF NEUROPSYCHOLOGICAL-BASED PSYCHOTHERAPY FOR MENTAL DISORDERS IN CHILDREN AND ADOLESCENTS

Regarding the effectiveness of treatment of mental disorders in children and adolescents, diverse sources of evidence support the links between psychotherapy and neuropsychology for mental disorders.

Firstly, various studies have found that comprehensive or combined intervention, which includes both neuropsychological rehabilitation and CBT, has positive effects both on mental and neurological problems in adults (e.g., Martínez-González & Piqueras, 2015; Martínez-González et al., 2013, respectively). This can be considered as empirical support for the usefulness of neuropsychology for the clinical psychological treatment of mental disorders in children and adolescents.

Secondly, one of the most surprising findings has been the effectiveness of psychological intervention by examining changes at the neuropsychological, neuroanatomical, and neurofunctional levels. That is, apart from achieving change at the level of widely contrasted clinical symptoms (Child Mind Institute, 2017), exclusively psychotherapeutic interventions produce changes in brain metabolic activity measured by neuroimaging in people with internalizing mental disorders (anxiety and depression) (Barsaglini et al., 2014; Martínez-González & Piqueras, 2010; Marwood et al., 2018; Sankar et al., 2018), as well as changes in neuropsychological functioning (e.g., Martínez-González et al., 2015). Furthermore, this point is even more important because, as indicated by authors such as Evans et al. (2014), cognitive deficits are associated with deterioration in psychosocial functioning and, therefore, treatments should address not only clinical symptoms, but also neuropsychological and psychosocial functioning.

Because different studies highlight the limited scope and quality of the treatments (Jorm et al., 2017), some authors propose specifically treating cognitive deficits in order to improve them and achieve better therapy outcomes. Thus, for example, a recent study found that CBT did not produce changes in memory and executive functions, so these variables were interpreted as traits rather than as states or a consequence of clinical symptoms (Vandborg et al., 2015). In this sense,

several authors point out that it is feasible to improve well-established psychological treatments by improving memory and learning through cognitive and educational techniques (Harvey et al., 2014). In other words, it would be a matter of using cognitive support strategies to improve the effects of classic CBT.

Finally, a recent study points out that the biases and cognitive deficits so prevalent in anxiety disorders and depression have not been sufficiently addressed by traditional treatments. Hence, the authors suggest that focusing treatment on the major biases and deficits could be strategies to improve treatment effectiveness (Gold et al., 2016).

NEUROPSYCHOLOGICAL SUPPORT STRATEGIES TO IMPROVE THE EFFECTIVENESS OF EMPIRICALLY-SUPPORTED PSYCHOLOGICAL THERAPY

Integrative neuropsychological and transdiagnostic perspective

Among the few scientific approaches that have attempted to incorporate knowledge from the neuropsychological and neurocognitive fields into psychological therapy is Gillberg's work (2010, 2019) on Early Symptomatic Syndromes Eliciting Neurodevelopmental Clinical Examinations (ESSENCE). Gillberg's (2010, 2019) ESSENCE approach, although focused on neurodevelopmental disorders, is, in our opinion, one of the main exponents of a new transdiagnostic neuropsychological perspective, and shows potential applications for psychological therapy with children and adolescents. Thus, this author points out that the vast majority of children under the age of four with neurodevelopmental problems show common alterations, as demonstrated by the very high comorbidity among these disorders, a large overlap of symptoms and cognitive dysfunctions, etc. These alterations or common elements are alterations in general development, communication and language, social interaction, motor anomalies, inattention, hyperactivity/hypoactivity, behavioral problems, mood regulation problems, eating problems, and sleep disturbances. Although this new perspective has focused on the so-called neurodevelopmental disorders, and not on other problems such as emotional or behavioral disorders, it seems obvious that the approach resembles other approaches from transdiagnostic and clinical psychology that consider some transdiagnostic processes, such as sleep, eating,

emotion regulation, psychomotricity, etc. as key factors for child development. They also consider that these variables underlie the onset and development of neurodevelopmental disorders and also the commencement of internalizing and externalizing disorders occurring in developing children who may share many of these maturity deficits.

The second particularly relevant scientific proposal that has sought to integrate neuropsychology and psychological therapy is the new transdiagnostic approach of Harvey et al. (2004), which proposes the existence of a range of etiological cognitive and/or behavioral processes shared by various psychological disorders; that is, processes that are elevated in a wide range of psychological disorders, which contribute causally to the development and/or maintenance of the symptoms associated with these disorders. The approach focuses specifically on alterations in cognitive or neuropsychological processes - such as attention, memory, reasoning, cognition, and behavior -, which are common to most mental disorders, both emotional and behavioral. The aim of this work was to try to systematize the psychological processes that could be involved in the main and most common mental disorders, in order to develop a global form of transdiagnostic CBT.

Harvey et al. (2004) isolated 14 transdiagnostic processes associated with five key cognitive domains: attention, memory, reasoning, thought, and behavior. The 14 processes were: external selective attention, internal selective attention, and attentional avoidance (attention); explicit selective memory, recurrent memory, and overgeneralized memory (memory); interpretive biases, expectation biases, and emotional reasoning (reasoning); recurrent negative thinking, positive and negative metacognitive beliefs, and thought suppression (thought); and avoidance and safety behaviors (behavior) (Harvey et al., 2004). More recently, with the aim of including neuropsychological strategies to improve the effectiveness of CBT, these authors published a paper entitled "Improving outcome of psychosocial treatments by enhancing memory and learning" (Harvey et al., 2014), in which they suggest and exemplify cognitive strategies to improve the effectiveness of CBT through strategies that would improve memory and learning such as:

1. Attention Recruitment. Therapists should reduce the division of attention during encoding and should develop ways to recruit and scaffold attention onto the encoding of the therapy points.
2. Categorization of reality. Therapists should help their patients better learn and remember by using tools that help categorize multiple therapy points based on common themes/principles, for example, linking information to meaningful fragments will increase recall.

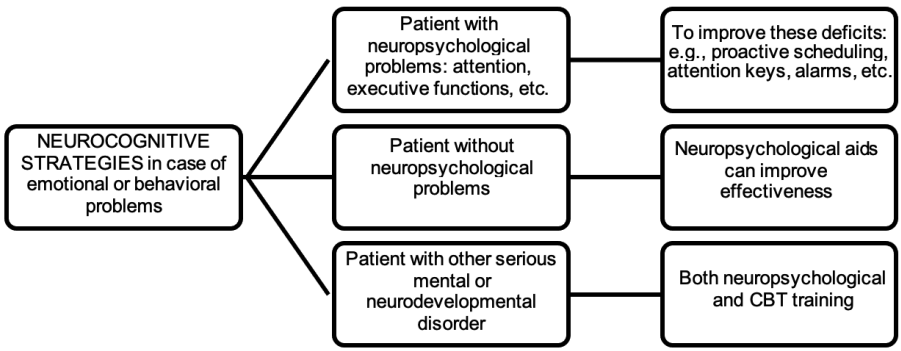
3. Evaluation of the alternatives. A potentially powerful tool that therapists could use is to encourage the patient to generate, compare, and evaluate a variety of different responses to situations, strategies or examples of behaviors.
4. Application of learning to other contexts or similar situations. The aim of application is to explicitly link abstract principles to specific cases to guide people to see the specific situations in which they will have to apply the knowledge. Specific types of application include problem-oriented learning or presenting therapy points in terms of how patients can solve specific problems they encounter in their lives, and using problem solving to evoke past knowledge.
5. Repetition or practice remembering. There is clear and strong evidence that repetition helps to automate new knowledge and that distributed or spaced repetition is much more effective in the learning process than mass learning. Repetition of therapy points may involve the therapist's repeating, reformulating, summarizing, or revisiting therapy points.
6. Cue-based reminders. Practicing mnemonics encourages faster encoding and recovery. Therefore, the use of mnemonics helps the patient develop methods for remembering key therapy points.
7. Praising recall. Classic experiments in the behavioral tradition have clearly demonstrated that providing positive consequences for a behavior increases the likelihood of that behavior. Perhaps reinforcements, such as praise for successfully recalling information discussed in therapy or implementing a therapy point, could reinforce the use of remedial practice and thus promote better learning.
8. Paying attention to transdiagnostic variables such as sleep and physical exercise, which are known to improve memory and learning.

Another interesting approach from the neuropsychological point of view is that proposed by Aldao et al. (2010). These authors related some of the strategies of emotion regulation — that is, the way in which individuals manage (regulates) their own emotions — to various internalizing (anxiety and depressive disorders) and externalizing (addictions and eating disorders) disorders. Recent studies highlight the important role of emotion regulation in explaining the relationship between EF and depressive symptoms and suggest that clinical interventions targeting emotion regulation skills may provide a strategy for the prevention and treatment of depression (Wante et al., 2017).

Finally, apart from a few specific proposals that have attempted to integrate child neuropsychology and CBT, we propose in Figure 1 the following decision tree when trying to improve CBT with neuropsychological or neurocognitive strategies.

Figure 1

Decision tree in the use of neurocognitive strategies in CBT



In summary, the neuropsychology of internalizing and externalizing mental disorders is an expanding field, which has received less attention than neurodevelopmental disorders and severe mental disorders with a longer neuropsychological tradition. However, in the next few years, an exponential growth is expected in this field, which will lead to greater knowledge of the etiology and neuropsychological maintenance of these so-called internalizing and externalizing disorders, as well as to a greater number of neuropsychology-based assessment and treatment tools aimed at improving the effectiveness of empirically-supported psychosocial interventions and the prognosis of these disorders.

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Linking internalizing symptoms and dyadic adjustment during pregnancy among Portuguese first-time parents: The mediating role of dyadic coping • pág. 93-117
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Linking internalizing symptoms and dyadic adjustment during pregnancy among Portuguese first-time parents: The mediating role of dyadic coping

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Abstract

This study examined the mediating role of dyadic coping (DC) in the association between internalizing symptoms and dyadic adjustment in a sample of 184 couples expecting their first child. Each partner completed self-report questionnaires assessing symptoms of depression and anxiety, dyadic adjustment and DC during the second trimester of pregnancy. An extension of the actor-partner interdependence model for testing direct and indirect effects was used. Compared to men, women presented higher levels of internalizing symptoms and dyadic adjustment and engaged more in DC by self. Significant indirect effects of internalizing symptoms on dyadic adjustment via common DC and DC by one's partner were found. Specifically, higher internalizing symptoms were associated with lower common DC and DC by one's partner, which, in turn, were associated with lower dyadic adjustment. This mediation occurred either within a person as well

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as across partners and occurred similarly for women and men. These results suggest that primiparous couples may benefit from DC-enhancing interventions, such as the cognitive-behavioral couple-based programs Couples Coping Enhancement Training (CCET) and Coping-Oriented Couple Therapy (COCT), to assist them in responding sensitively to their partners' psychological symptoms, which may have a positive effect on marital adjustment.

Keywords*:* dyadic adjustment, dyadic coping, internalizing symptoms, pregnancy, first--time parents.

Associação entre sintomas internalizantes e ajustamento diádico durante a gravidez em pais Portugueses primíparos: O papel mediador do *coping* diádico

Resumo

Neste estudo analisou-se o papel mediador do *coping* diádico (CD) na associação entre os sintomas internalizantes e o ajustamento diádico numa amostra de 184 casais à espera do primeiro filho. Cada elemento do casal preencheu, no segundo trimestre de gravidez, um conjunto de questionários que avaliavam os sintomas depressivos e de ansiedade, o ajustamento diádico e o *coping* diádico. Uma extensão do *actor--partner interdependence model* foi utilizada para testar os efeitos diretos e indiretos. Comparativamente aos homens, as mulheres reportaram maiores níveis de sintomas internalizantes e de ajustamento diádico, e envolveram-se em mais CD pela própria. Foram encontrados efeitos indiretos significativos dos sintomas internalizantes no ajustamento diádico via CD conjunto e CD pelo parceiro. Especificamente, mais sintomas internalizantes mostraram-se associados a menor envolvimento em formas de CD conjunto e CD pelo parceiro, que por sua vez se associavam a um menor ajustamento diádico. Esta mediação ocorreu quer intra-sujeitos quer entre-casal e ocorreu de forma similar para mulheres e homens. Estes resultados sugerem que os pais primíparos podem beneficiar de intervenções promotoras de CD, tais como os programas de base cognitivo-comportamental para casais, o *Couples Coping Enhancement Training* (CCET) e o *Coping-Oriented Couple Therapy* (COCT). Estes programas podem ser particularmente uteis para ajudar os casais a responder de forma mais sensitiva aos sintomas psicológicos do(a) parceiro(a), o que pode ter um efeito positivo no ajustamento conjugal.

Palavras-chave*:* ajustamento diádico, coping diádico, sintomas internalizantes, gravidez, pais primíparos.

INTRODUCTION

Becoming a parent represents a source of joy and satisfaction and has the capacity to strengthen the bonds within couples and families. However, it may also be considered a stressful experience, enhancing new difficulties or increasing pre-existing difficulties (Cowan & Cowan, 1995), which requires the development of new resources and coping strategies by both parents (McKellar et al., 2009), not only as individuals but also as a couple. Pregnancy and the transition to parenthood may be easily understood as a context of dyadic stress, which represents "any form of emotional or problem-centered stress directly concerning the couple as a unit" (Bodenmann, 1995, pp. 35-36). This is particularly relevant for first-time parents, with consistent empirical evidence showing an increase in or the development of psychological symptoms (most notably symptoms of anxiety and depression) during pregnancy and after childbirth (e.g., Morse et al., 2000; Parfitt & Ayers, 2014; Vismara et al., 2016) and a decline in relationship satisfaction (e.g., Bäckström et al., 2018; Don & Mickelson, 2014; Doss et al., 2009; Lawrence et al., 2008).

For both mothers and fathers and regardless of parity, several studies have shown a negative association during the transition to parenthood between psychological symptoms (stress, depression, anxiety) and diverse relationship outcomes (e.g., relationship satisfaction, couples' positive and negative interactions; Bower et al., 2013; Figueiredo et al., 2008; Figueiredo et al., 2018; Parfitt & Ayers, 2014). However, it has also been suggested that the association between stress (and psychological symptoms) and relationship outcomes can be explained by adaptive processes, which can be generally defined as the ways in which couples cope with conflict and marital difficulties (Kluwer, 2010). From this perspective, the ability of both partners in a couple to adjust well to the transition from partner to parent is likely to be influenced by their individual coping strategies (McKellar et al., 2009); however, because expecting and having a child affects both members of the couple as a unit, we argue that coping with this event also encompasses strategies at the dyadic level. Hence, it is important to increase our understanding of which shared (dyadic) strategies, such as dyadic coping (DC), should be promoted during pregnancy to help first-time parents successfully adjust to this transition.

Dyadic coping is the basic interpersonal process of the systemic transactional model (STM; Bodenmann, 1995), which emphasizes the reciprocal nature of stress appraisals and coping efforts among couples. The underlying idea of DC is that the stress of one of the partners will always affect the other ("we-stress"), and therefore, their coping strategies are interrelated. According to the STM, when partners face a stressful situation, once one of the partners communicates stress, the other can either not respond or engage in positive or negative forms of DC. In

brief, positive DC includes supportive DC (when a partner assists the other in his/her coping efforts with the goal of reducing the partner's and his/her own stress, for example, by helping with daily tasks or providing practical advice or helping the other to reframe the situation) and delegated DC (when one partner, when asked by the other, takes over responsibilities in order to reduce the other partner's stress). In contrast, negative forms of DC include hostile (e.g., disinterest, distancing, minimizing the partner's stress), ambivalent (when the partner provides support in a way that is inadequate) and superficial (e.g., not listening to the partner's answer when he/she expresses his/her feelings) efforts to assist the stressed partner (Bodenmann, 2005). To overcome any dyadic stressor, both members of the couple can also engage in common DC, which occurs when both partners participate in the coping process in a complementary way through, for example, joint problem solving, joint information seeking, and the sharing of feelings.

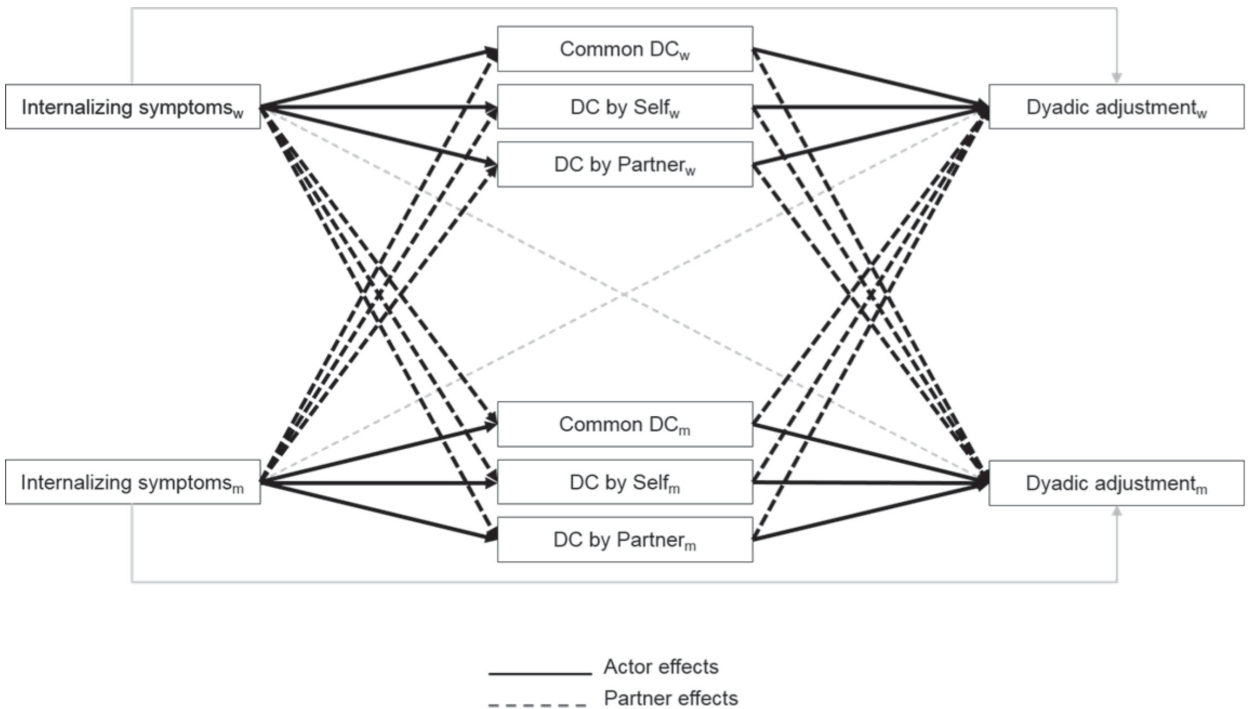
There is a noteworthy body of literature consistently showing a significant and direct association between different forms of DC and diverse relationship outcomes as well as (less consistently) individual indicators of well-being (e.g., stress, symptoms of anxiety and depression, quality of life; Bodenmann et al., 2010; Bodenmann et al., 2011; Falconier, Nussbeck et al., 2015; Gasbarrini et al., 2015; Levesque et al., 2014; Regan et al., 2014), including during pregnancy (Alves et al., 2018; Brandão et al., 2020; Molgora et al., 2019). For instance, Alves et al. (2018) showed that couples in which women presented high levels of depressive symptoms during pregnancy reported lower DC strategies as well as lower dyadic adjustment compared to couples in which women presented minimal or no depressive symptoms. This suggests that psychological distress among pregnant women may have negative repercussions on couples' dyadic adjustment as well as on the ways they manage stress as a couple. Hence, it is possible that coping with stress as a couple may also have a role in the link between psychological symptoms and the dyadic adjustment of couples. Indeed, across multiple contexts, it has been shown that DC serves as an adaptive interpersonal process explaining the association between individual and relationship well-being (e.g., Alves et al., 2020; Alves, et al., 2019; Bodenmann et al., 2008; Chaves et al., 2018; Gasbarrini et al., 2015; Karademas & Roussi, 2017; Rusu et al., 2018). For example, one study of couples in the general population tested two competing models of common DC as a mediator of the association between relationship satisfaction and depressive mood (Gana et al., 2017). These authors found stronger support for the mediation of common DC in the link between depression and relationship satisfaction (vs. in the link between relationship satisfaction and depression), but only for men. In other recent studies, DC was also found to be a significant mediator in the association between stress and the emotional and dyadic adjustment of infertile couples (Chaves et al., 2018)

as well as of couples coping with financial strain (Karademas & Roussi, 2017). This evidence supporting the mediating role of DC is particularly notable and was found to occur not only within individuals but also across partners (e.g., Alves et al., 2020; Brandão et al., 2020; Gabriel et al., 2016; Rusu et al., 2018), particularly when dyadic analytic methods were used, such as the actor-partner interdependence model (APIM; Cook & Kenny, 2005). However, despite recent evidence in the context of the transition to parenthood, to the best of our knowledge, no studies have examined the mediating role of DC in the association between individual and dyadic adjustment among first-time parents.

Adopting a dyadic approach, the main objective of the present study was to assess the mediating role of DC (enacted by the self, by the partner and common DC) in the association between couples' internalizing symptoms (symptoms of anxiety and depression) and dyadic adjustment in first-time parents during pregnancy (see Figure 1). Based on the literature review, it was posited that higher common DC and DC enacted by oneself or by one's partner would be associated with lower levels of internalizing symptoms and greater dyadic adjustment for both mothers and fathers. Considering the evidence showing the indirect role of DC in the association between different forms of stress and relationship adjustment (e.g., Chaves et al., 2018; Karademas & Roussi, 2017), we hypothesized that higher internalizing symptoms would be associated with lower DC, which, in turn, would be associated with decreased dyadic adjustment. Given the reciprocity and mutuality between members of a couple that characterize pregnancy and the transition to parenthood, as well as the evidence showing both within-subjects and between-subjects effects in the association between DC and relationship satisfaction (for a review, see Falconier, Jackson et al., 2015), significant actor and partner effects (direct and indirect) were also expected.

Figure 1

Conceptual diagram showing the proposed actor partner interdependence mediation model. *Note*. Internalizing symptoms as the independent variable, common dyadic coping (Common DC), DC by Self, and DC by partner as mediators, and dyadic adjustment as the dependent variable. Partners' predictors and error disturbances for the mediators and outcome variables were correlated, but were omitted from the figure for the sake of clarity. Psychological problems history and infertility history were included as covariates in the model. w = women; m = men.



METHOD

Participants and procedure

This study was approved by the Research Ethics Committees of the host institution and of one university hospital (Centro Hospitalar e Universitário de Coimbra, E.P.E. [CHUC-EPE]). The inclusion criteria of the study were as follows: (1) women are in the second trimester of a singleton pregnancy without any complications with the baby (e.g., fetal anomalies or other medical problems) or other adverse clinical events; (2) both partners are in a relationship (formally married, cohabiting or dating); (3) both partners are at least 18 years old; and (4) both partners are able to read and understand the Portuguese language to complete the set of questionnaires.

The data collection occurred between November 2015 and November 2016 in the university hospital (CHUC-EPE). Eligible women (and their partners, when applicable) were first informed about the general aim of the study by their obstetrician. Those who agreed to be contacted by the researchers were presented detailed information about the study (specific aims and instructions, confidentiality considerations). Participants who decided to participate signed a consent form (a copy of which was given to all participants) and were given the questionnaires in a sealed envelope. They were asked to complete them independently at home without collaboration and to return them at the next obstetric appointment.

The researchers initially contacted 611 women/couples, 52 of whom refused to participate (due to a lack of time or interest in the study). A total of 551 women/couples agreed to participate in the study, 335 of whom returned the questionnaires (participation rate: 60.8%); 25 questionnaires were excluded from the analyses because the questionnaires were completed only by the woman. Of the remaining 310 couples, seven couples were excluded because they did not meet the inclusion criteria. Given the aim of the present study, 119 multiparous couples were also excluded.

The final sample consisted of 184 heterosexual primiparous couples. The sociodemographic and clinical characteristics of the sample are presented in Table 1. Overall, women were younger than men. More women than men reported having a university-level education, and fewer women than men reported having a middle-school education. Men reported being employed more frequently than women did. Women reported a history of psychological problems and treatment more frequently than men did.

Table 1
Sociodemographic and clinical characteristics of the sample (N = 184 couples)

	Women	**Men**	t / χ^2	d / φ_c
Age (years), *M* (*SD*) Min - Max	30.29 (4.58) 19-43	32.16 (4.97) 19-46	-6.45***	0.67
Educational level, *n* (%)				
Middle school	6 (3.3)	42 (23.0)	34.38***	0.31
High school	63 (34.8)	66 (36.1)		
University	112 (61.9)	75 (41.0)		
Professional status, *n* (%)				
Employed	147 (80.8)	164 (91.1)	8.00**	0.15
Unemployed/Other[a]	35 (19.2)	16 (8.9)		
Psychopathology history, *n* (%)				
Psychological problems (yes)	59 (32.4)	12 (6.7)	38.06***	0.32
Psychological treatment (yes)	52 (28.7)	20 (11.0)	17.75***	0.22
Relationship status, *n* (%)				
Married	101 (54.9)			
Cohabitating	74 (40.2)			
Dating	9 (4.9)			
Relationship length (years), *M* (*SD*)	6.04 (4.04)			
Obstetric history, *n (%)*				
Pregnancy loss history (yes)	28 (15.2)			
Infertility history (yes)	21 (11.4)			
Current pregnancy, *n* (%)				
Desired pregnancy (yes)	181 (98.4)			
Pregnancy complications (yes)	63 (34.2)			
Gestational weeks, *M* (*SD*)	22.77 (5.58)			

[a] Other situations included three students (1 man and 2 women).

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

Measures

Sociodemographic and clinical characteristics

Sociodemographic data and psychopathology history were obtained by self-report from both partners. Women also provided data concerning their obstetric history and current pregnancy through yes/no questions.

Internalizing symptoms

Two scales were used to assess internalizing symptoms. The Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987; Portuguese version [PV]: Areias et al., 1996) is a 10-item self-report questionnaire specifically designed to assess depressive symptoms during the perinatal period. The items cover different emotions (e.g., sadness, tearfulness) that individuals are asked to rate based on the previous seven days. Each item was rated using a 4-point response scale (range 0 – 3), with higher values indicating more depressive symptoms. In this sample, Cronbach's α was .86 for women and .84 for men. The anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A; Zigmond & Snaith, 1983; PV: Pais-Ribeiro et al., 2007) was used to assess anxiety symptoms. This subscale includes 7 items to be answered on a 4-point response scale (range 0 – 3) based on the previous week. Higher values indicate more anxiety symptoms. In this sample, Cronbach's α was .84 for women and .78 for men. Given the strong correlations between depressive and anxiety symptoms ($r > .70$, $p < .001$) and the absence of hypotheses for each dimension separately, we aggregated the two subscales on a single score for internalizing symptoms.

Dyadic coping

DC was assessed using the Dyadic Coping Inventory (DCI; Bodenmann, 2008; PV: Vedes et al., 2013). This inventory consists of 37 items answered on a 5-point response scale (1 = *very rarely* to 5 = *very often*). The DCI assesses different components of the STM, including subscales for stress communication (4 items), partner-oriented behaviors such as emotion (3 items) and problem-focused (2 items) supportive DC, delegated DC (2 items) and negative DC (4 items), as well

as couple-oriented behaviors such as emotion (2 items) and problem-focused (3 items) common DC. Except for common DC subscales, two item-parallel versions exist for each subscale: respondents rate one's own stress communication and coping efforts to help the partner when he/she communicates stress (subscales of DC enacted by oneself) and their partners' stress communication and coping efforts when one communicates stress (subscales of DC enacted by the partner). Different total scores can be separately calculated: total scores for each of these specific subscales (by computing the mean of the items on the subscale), with higher scores denoting more of the behavior of interest; and composite scores that include all the subscales enacted by oneself (composite score of DC by oneself; 15 items) and all the subscales enacted by the partner (composite score of DC by the partner; 15 items). The composite scores were obtained by computing the mean of all the items of the respective subscales (items from the negative DC subscale were reverse-coded), with higher scores reflecting more perceived DC in oneself and in one's partner, respectively. In this study, we used both individual subscale scores and composite scores. In this sample, Cronbach's α varied between .84 (DC by self – women) and .89 (common DC – women).

Dyadic adjustment

The Revised Dyadic Adjustment Scale (RDAS: Busby et al., 1995) was used to assess relationship satisfaction (4 items), cohesion (4 items) and consensus (6 items). The 14 items are rated on a 6-point response scale (e.g., 0 = *always disagree* to 5 = *always agree*) or a 5-point response scale (e.g., 0 = *never* to 4 = *every day*), with higher scores indicating higher relationship quality. In this sample, Cronbach's α was .84 for both women and men.

Data analyses

Descriptive statistics were computed using IBM SPSS version 23 for sample and main study variable characterization. Bivariate Pearson correlations were performed between the main study variables, including between both partners' scores, to estimate dyadic nonindependence. Paired *t*-tests were computed to assess differences between women and men on the main study variables. We used an extension of the APIM (Cook & Kenny, 2005) for testing direct and indirect effects (Ledermann et al., 2011) in Mplus version 8 (Muthén & Muthén, 1998-2017). The APIM allows us to simultaneously estimate the effects of one partner's characteristics on one's own

(actor effects) and the other's (partner effects) adjustment while controlling for the other partner's characteristics. This approach accounts for the interdependence of both partners' scores within dyads by specifying correlations between the predictors as well as the error disturbances for the mediators and outcome variables (not shown in Figure 1 to maintain clarity). The predictor and mediator variables were grand-mean centered prior to the analyses, and unstandardized path coefficients and their standard errors were reported (Kenny et al., 2006). In this study, mediation is evident when the effect of women's and men's internalizing symptoms on women's or men's dyadic adjustment can be explained by a significant indirect effect via one's own or the partner's DC dimensions (common DC, DC by self, and DC by one's partner). A single model was performed that included all the mediators simultaneously. Statistically significant direct effects of the independent variables on the outcomes are not necessarily required for mediation (Shrout & Bolger, 2002). To test for the significance of indirect effects, maximum likelihood bootstrap procedures using 1000 samples were performed (Shrout & Bolger, 2002). This strategy generates 95% bias-corrected and accelerated confidence intervals (BCa CIs) of the indirect effects, which are considered significant if zero does not fall within the lower and upper CIs. Sociodemographic, obstetric and psychological variables that were significantly associated with the outcome variables (i.e., women's history of infertility and men's history of psychological problems) were included as covariates in the mediation analyses.

To reduce the model's complexity and because we did not establish specific hypotheses for women and men, we started by examining the fit of a full constrained model (i.e., actor effects and partner effects, respectively, were fixed as equal for women and men). If the model yields a nonsignificant chi-square value ($p > .05$), this suggests that women and men are empirically indistinguishable, and then there will be only one estimate for the actor effects and one estimate for the partner effects; on the other hand, a rejectable chi-square value ($p < .05$) suggests that at least one pair of path coefficients was significantly different between women and men (Ackerman et al., 2010). In such cases, the paths will be successively unconstrained to address model misspecification. We assessed the overall model fit considering the following criteria: a nonsignificant chi-square statistic ($p > .05$), a comparative fit index (CFI) above .95, a standardized root mean square residual (SRMR) below .08, and a root mean square error of approximation (RMSEA) below .05 (Hu & Bentler, 1998). Significance was set at the level $p <. 05$. Effect sizes were interpreted as follows: small: $d \geq 0.20$, $\varphi_c \geq .10$, $r \geq .10$, $R^2 \geq .02$; medium: $d \geq 0.50$, $\varphi_c \geq .30$, $r \geq .30$, $R^2 \geq .13$; and large: $d \geq 0.80$, $\varphi_c \geq .50$, $r \geq .50$, $R^2 \geq .26$ (Cohen, 1988). Missing data were managed using full information maximum likelihood (i.e., the model was estimated considering all available data) in Mplus.

RESULTS

Descriptive statistics and correlations

Table 2 shows the means, standard deviations, paired *t*-tests and intercorrelations for the main study variables. Compared to men, women presented higher levels of internalizing symptoms and dyadic adjustment, and they engaged more in DC by self. Partners' variables were moderately to strongly correlated, underlining the nonindependence within couples. We found significant associations between women's history of infertility and dyadic adjustment (r = -.16, p = .044) and between men's history of psychological problems and dyadic adjustment (r = -.16, p = .037). These variables were controlled for in the mediation models.

Table 2
Descriptive statistics and bivariate correlations between study variables

	Descriptives				Correlations				
	Women	Men	$Diff_{w-m}$						
	M (*SD*)	*M* (*SD*)	*t*	*d*	1	2	3	4	5
1. Internalizing symptoms	5.43 (3.68)	4.32 (3.30)	3.76***	0.39	**.34*** **	-.42***	-.31***	-.34***	-.35***
2. Dyadic adjustment	55.96 (7.05)	54.57 (7.60)	3.27**	0.34	-.41***	**.69*** **	.59***	.61***	.60***
3. Common DC	4.04 (0.71)	3.96 (0.66)	1.64	0.17	-.28***	.62***	**.57*** **	.67***	.61***
4. DC by Self	4.17 (0.45)	3.98 (0.46)	5.09***	0.53	-.30***	.50***	.66***	**.43*** **	.75***
5. DC by Partner	4.00 (0.55)	4.03 (0.50)	-0.77	0.08	-.40***	.63***	.71***	.75***	**.48*** **

Note. Correlations for women are presented below the diagonal, and for men above the diagonal. Correlations within couples are showed in bold on the diagonal. DC = dyadic coping.
** p < .01; *** p < .001

Mediation analyses

To identify the most parsimonious model testing the indirect effects of common DC, DC by self and DC by one's partner on the associations between internalizing symptoms and dyadic adjustment, we first constrained each pair of actor effects and partner effects, respectively, as equal for both women and men and examined the model fit. The model fit the data well: χ^2= 14.627, df = 16, p = .552; RMSEA = 0.000; SRMR = 0.044; and CFI = 1.000. Then, the pair of path coefficients were fixed to be equal across genders (for this reason, Tables 3 and 4 report values for actor and partner effects vs. for women and men separately, as this would duplicate data).

Direct effects

Table 3 shows that higher levels of internalizing symptoms were associated with lower DC (all dimensions) both within-person (actor effects) and across partners (partner effects), explaining between 10% and 17% of the DC dimension variance. Regarding the associations between DC and dyadic adjustment, we found two actor effects and one partner effect: an individual's common DC and DC by one's partner were positively associated with his/her own dyadic adjustment, and one partner's DC by his/her partner was positively associated with the other partner's dyadic adjustment. Any significant direct effect was observed for DC by self. Finally, higher levels of internalizing symptoms were associated with lower dyadic adjustment: both actor and partner significant effects were found before adjustments were made for the mediators (total effect), whereas when adjustments were made for the mediators (direct effect), only the actor effect was observed. The independent variables and mediators considered (including the covariates) accounted for a high proportion of variance in dyadic adjustment for women (52%) and men (48%), respectively.

Table 3
Mediation analyses: Direct and total effects between study variables

	Effect of internalizing symptoms on dyadic adjustment							
	Actor effect				Partner effect			
	B (SE)		*p*		*B (SE)*		*p*	
Direct effect	**-0.31 (0.09)**		**.001**		-0.08 (0.09)		.365	
Total effect	**-0.69 (0.10)**		**< .001**		**-0.39 (0.10)**		**< .001**	
Mediators	Effect of internalizing symptoms on mediators				Effect of mediators on dyadic adjustment			
	Actor effect		Partner effect		Actor effect		Partner effect	
	B (SE)	*p*	*B (SE)*	*p*	*B (SE)*	*p*	*B (SE)*	*p*
Common DC	**-0.05 (0.01)**	**< .001**	**-0.03 (0.01)**	**.004**	**2.79 (0.64)**	**< .001**	0.47 (0.60)	.434
DC by Self	**-0.03 (0.01)**	**< .001**	**-0.03 (0.01)**	**< .001**	0.96 (1.28)	.456	0.03 (1.15)	.983
DC by Partner	**-0.05 (0.01)**	**< .001**	**-0.03 (0.01)**	**< .001**	**3.17 (1.17)**	**.007**	**2.01 (1.01)**	**.048**

Note. Unstandardized maximum likelihood estimates are described. Significant estimates are in bold. *B* and *SE* are equal for men and women. R^2 dyadic adjustment: women = .52, men = .48; R^2 Common DC: women = .10, men = .10; R^2 DC by Self: women = .14, men = .13; R^2 DC by Partner: women = .17, men = .17.

Indirect effects

We found significant indirect effects of internalizing symptoms on participants' dyadic adjustment via common DC and DC by one's partner (see Table 4). This mediation occurred either completely within-person (paths $_{a,a,a}$ in Table 4) as well

as across partners (paths $_{p,a,a}$), similarly for women and men. Regarding the within-person mediation, Figure 2 shows that an individual's higher levels of internalizing symptoms were significantly associated with his/her own lower engagement in common DC and lower perception of DC by his/her partner, which, in turn, was associated with his/her lower dyadic adjustment. The across-partner mediation suggests an indirect effect of one partner's internalizing symptoms on the other partner's dyadic adjustment via his/her own common DC and DC by his/her partner. In sum, the more internalizing symptoms one person or his/her partner experiences, the less the person would engage in common DC or perceive DC efforts by his/her partner, and, in turn, the less marital adjustment the person would feel.

Table 4

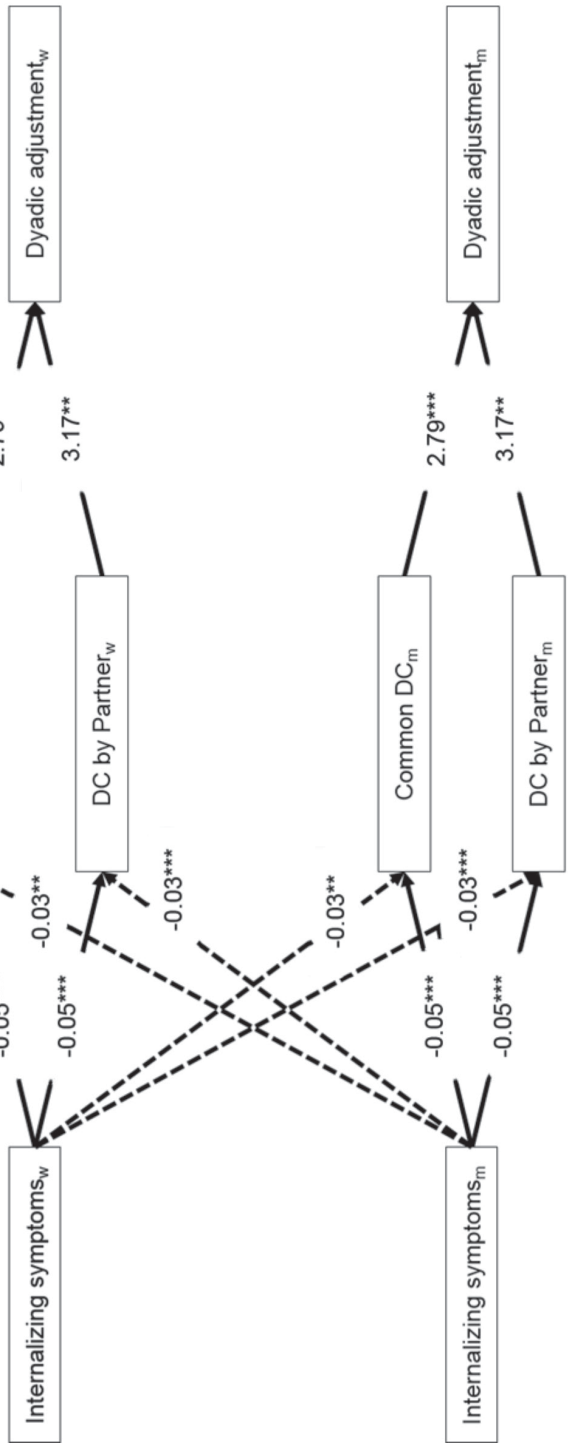
Mediation analyses: Indirect effects of dyadic coping (DC) on the associations between internalizing symptoms (IS) and dyadic adjustment (DA)

Indirect effect					**IE (*SE*)**	*p*	95% CI **(LLCI/ULCI)**
Common Dyadic Coping							
IS_a	→	Common DC_a	→	DA_a	**-0.13 (0.04)**	.001	**[-0.21, -0.06]**
IS_a	→	Common DC_p	→	DA_a	-0.01 (0.02)	.480	[-0.06, 0.02]
IS_p	→	Common DC_a	→	DA_a	**-0.08 (0.04)**	.016	**[-0.17, -0.03]**
IS_p	→	Common DC_p	→	DA_a	-0.02 (0.03)	.462	[-0.09, 0.03]
Dyadic coping by Self							
IS_a	→	DC by $Self_a$	→	DA_a	-0.03 (0.04)	.469	[-0.12, 0.06]
IS_a	→	DC by $Self_p$	→	DA_a	-0.00 (0.03)	.983	[-0.06, 0.06]
IS_p	→	DC by $Self_a$	→	DA_a	-0.02 (0.03)	.472	[-0.09, 0.04]
IS_p	→	DC by $Self_p$	→	DA_a	-0.00 (0.04)	.983	[-0.08, 0.07]
Dyadic coping by Partner							
IS_a	→	DC by $Partner_a$	→	DA_a	**-0.15 (0.06)**	.019	**[-0.30, -0.04]**
IS_a	→	DC by $Partner_p$	→	DA_a	-0.06 (0.03)	.082	[-0.15, -0.01]
IS_p	→	DC by $Partner_a$	→	DA_a	**-0.09 (0.04)**	.023	**[-0.18, -0.02]**
IS_p	→	DC by $Partner_p$	→	DA_a	-0.09 (0.05)	.060	[-0.22, -0.01]

Note. Unstandardized maximum likelihood estimates for indirect effects (IE) are displayed. Significant IE are in bold. IE are equal for men and women. CI = confidence interval; LLCI/ULCI = lower and upper CI; a = actor; p = partner.

Figure 2

Statistical diagram of the significant indirect effects of DC dimensions on the associations between internalizing symptoms and dyadic adjustment. *Note.* Paths values represent unstandardized maximum likelihood estimates. Estimates are equal for women and men. w = women; m = men. ** $p <$ .01; *** $p <$ .001.



DISCUSSION

The first transition to parenthood represents a critical event for each parent as well as for the couple as a unit (Lawrence et al., 2008) and entails significant changes at both the individual and the relationship level (Cowan & Cowan, 2000). The adjustment of first-time parents to the transition to parenthood, which is an important dyadic event (and stressor), is likely to be influenced not only by their own individual coping strategies but also by their shared efforts to cope with stressors (i.e., dyadic coping). Accordingly, beyond the analysis of the direct association between coping strategies and individual and relationship adjustment, in this study, we are the first to examine the mediating role of DC in the association between internalizing symptoms (anxiety and depression) and dyadic adjustment in couples expecting their first child. Our main findings demonstrate that higher internalizing symptoms are associated with lower common DC and DC by one's partner, which, in turn, are associated with lower dyadic adjustment. Our results also indicate that this mediation occurred either within individuals or across partners and similarly for mothers and fathers.

Based on the preliminary analyses, our results show that mothers (vs. fathers) present higher levels of internalizing symptoms. This result is not surprising and is consistent with the findings of empirical studies showing that late pregnancy and childbirth are emotionally challenging periods and are more distressing for mothers than for fathers (e.g., Figueiredo & Conde, 2011; Guedes & Canavarro 2014; Moreno-Rosset et al., 2016), as women usually experience more changes (both physical and psychological) than men. This is particularly true for first-time mothers, as the novelty of these changes may be experienced as more distressing and require more demanding reorganizations of individual and relationship roles. Our results also indicate that mothers report higher dyadic adjustment than fathers, which is not consistent with recent research showing a similar pattern of dyadic/relationship adjustment for both partners (e.g., Brandão et al., 2020; Figueiredo & Conde, 2015; Molgora et. al., 2019) or the earlier suggestion that despite women and men within the same couple experiencing the changes related to the transition to parenthood differently, they make similar appraisals of their relationships (Belsky et al., 1985). For example, the literature suggests that marital quality is stable or increases when both members of the couple are aware of their partners and their relationships (Shapiro et al., 2000). Despite being more psychologically distressing for women, it is possible that first-time mothers may feel more supported by fathers with respect to pregnancy-related demands (which may increase given the novelty of this experience), and perceiving support from one's partner (or his coping efforts when she communicates stress) may foster their relationship

satisfaction and therefore reinforce their dyadic adjustment (Don & Mickelson, 2014). This is a plausible explanation, as in our study, the strongest correlation with dyadic adjustment among mothers was indeed with the perceived DC by the partner. Regarding DC, our findings also indicate that first-time mothers report more DC by oneself than fathers do. This is supported by a recent review that revealed gender differences in the use of DC strategies among couples (Staff et al., 2017), particularly that mothers perceive themselves as communicating more stress (Molgora et al., 2019) and engaging in more DC than fathers (Alves et al., 2018; Chaves et al., 2018). Finally, as expected, for both first-time mothers and fathers, and fairly consistent with past studies conducted in the context of the transition to parenthood (e.g., Alves et al., 2018; Brandão et al., 2020; Molgora et al., 2019), higher DC was significantly associated with lower internalizing symptoms and higher dyadic adjustment.

During the transition to parenthood, couples are expected to manage the customary reorganizations of this period, including how they relate to each other as a couple, while also coping with their own and their partners' emotional distress. This is mainly relevant for parents expecting their first child, as the novelty of parenting may introduce strains into the intimate relationship. Accordingly, perceiving one's partner engagement in DC (actor effect) and being perceived by one's partner as engaging in DC (partner effect) were hypothesized to be a mechanism benefiting the couples' dyadic adjustment during this transition. Consistent with our prediction, our results show that the presence of internalizing symptoms is associated with lower engagement in DC as a couple (common DC) as well as with the perception of the partner's engagement in DC (DC by the partner) during pregnancy, which has a negative repercussion on the dyadic adjustment of couples. This indirect effect through common DC and DC by the partner occurred either within-person as well as across partners. Overall, these findings are in agreement with research documenting the negative interplay between depression and couples' impaired problem-solving skills in the general population (e.g., Coyne et al., 2002; Davila et al., 2009) and reinforce recent studies showing that DC is an important adaptive interpersonal process explaining the link between stress and relationship outcomes (e.g., Chaves et al., 2018; Gana et al., 2017; Karademas & Roussi, 2017). These results also reinforce the intrinsically interpersonal and dyadic nature of the transition to parenthood in two essential ways, which may have important implications for clinical practice with parents expecting a child (in addition to the benefits for their relationship adjustment): 1) the importance of communicating stress to one's partner during times of distress to elicit any (supportive) behavior from him/her; and 2) the ability of partners to cope with psychological distress together, rather than only supporting each other.

In addition, our findings suggest that whereas first-time mothers and fathers differ on internalizing symptoms, dyadic adjustment and engagement on DC by self, they do not differ in the mechanism explaining the association between internalizing symptoms and dyadic adjustment. Indeed, for both partners, the perceived partner's DC efforts when one communicates stress, as well as the couple-oriented efforts (i.e., their mutual efforts to cope with stress), are particularly relevant for helping both of them cope with internalizing symptoms, which have equally important and positive implications for their relationship. This is in line with the recently addressed result of a similar level of importance of partner support against postpartum distress for both mothers and fathers (Gillis et al., 2019). To some extent, this also seems to contest the traditional view of mothers as the care recipients and fathers as the support provider (Darwin et al., 2017) and highlight that both members of the couple may benefit from their joint coping strategies and, importantly, may serve as providers and recipients of support, thus reinforcing the relevance of similarity and reciprocity amid partners.

This study presents some limitations that should be noted, namely, the cross-sectional design, the convenience sample, and the data collection through self-report questionnaires. The cross-sectional design (in one particular trimester of pregnancy) prevents us from drawing conclusions about the causal relations between the study variables. Longitudinal studies in all pregnancy trimesters and extended throughout the first year postpartum would be valuable in clarifying the studied associations as well as in determining trajectories of change over time. The convenience sampling method at only one public health care setting also indicates the need for caution in the generalization of the results reported here in to other parents expecting their first child. Because of the focus only on first-time parents, future research should attempt to replicate these findings with experienced parents. Finally, regarding the questionnaires, by assessing DC only by self-report, complex dyadic processes and interactions have been more difficult to capture. Thus, the replication of this study incorporating observational approaches or interviews to assess dyadic interactions would be important, as they could offer more robust inferences about the role of interpersonal processes in individual and dyadic adjustment.

Despite its cross-sectional design, which precludes causality between our study variables, the present study has the following major advantages: collecting information from both first-time mothers and fathers (who are traditionally neglected in most empirical research during pregnancy), using the couple as the unit of analysis and using a data analysis technique that considered the interdependence between the two members of the couple (i.e., the APIMeM). In addition, by focusing on important indicators of individual and relational adjustment during the transition to parenthood and considering each member's perception of their

own and the other's DC, this study provides important insights and expands our understanding of an important interpersonal process used by couples to cope with psychological symptoms.

The results of this study have significant implications for clinical practice in health services dealing with expecting couples. First, they highlight the importance of screening both women and men for the presence of psychological symptoms (specifically, symptoms of depression and anxiety) during pregnancy. This is particularly important and indicates a need to reconsider the standard psychological care in this context, which is still mostly mother-centered. For mothers, this screening is of utmost importance, as it may contribute to offering mental health services as early as possible to offset possible progression into postpartum depression. Both partners are also relevant, as they may facilitate the early identification of couples that may benefit from psychological interventions that can prevent individual and relational maladjustment during the first-time transition to parenthood and parenting, thereby benefiting them as individuals, as couples and as parents. Second, this screening of emotional state should also be accompanied by a comprehensive assessment of both partners' coping resources, as our results indicate that DC may be compromised in both partners in the presence of increased internalizing symptoms and that this lower engagement in DC (particularly jointly and perceived by the partner) is associated with lower dyadic adjustment.

Given the similar indirect effects for mothers and fathers that we have found, these results also emphasize that both members of the couple may benefit from DC-enhancing interventions to assist them in responding sensitively to the other's psychological distress, which in turn may have a positive effect on the dyadic adjustment of both. Our specific result regarding the indirect effect through common DC suggests that first-time parents may actually benefit from a shared coping process rather than specific strategies to assist their partners in managing prenatal psychological distress. Accordingly, mental health professionals should help couples enhance ways to strengthen and maintain their engagement in joint coping efforts to handle common daily stressors across the transition to parenthood, rather than only focusing on the support provided by one partner to the other or the support provided by the nondistressed partner, as previously suggested (Bodenmann & Randall, 2013). In addition, and because the transition to parenthood is a period of increased change and reorganization, these first-time parents may also benefit from being trained on effective stress communication skills to make it easier to communicate their needs (stress) to their partners and, therefore, to feel more understood and to elicit more supportive DC behaviors from their partner.

To strengthen DC among couples, two programs grounded in cognitive-behavioral couple therapy (e.g., Baucom et al., 2008) and in the STM (Bodenmann, 1995, 2005)

are particularly relevant for first-time parents: the Couples Coping Enhancement Training (CCET; Bodenmann & Shantinath, 2004), a prevention model, and the Coping-Oriented Couple Therapy (COCT; Bodenmann, 2010; Bodenmann et al., 2008; Lau et al., 2016), a treatment model. The CCET and COCT include classical components of cognitive-behavioral therapy for couples (for example, communication and problem-solving training, enhancement of reciprocal positivity, acceptance work); however, its distinctiveness resides in the inclusion of psychoeducation about the role of daily external stress on couples' functioning and the 3-phase method, originally based upon the STM, and stress and coping empirical research in couples. The 3-phase method aims to improve dyadic stress communication and the couples' DC repertoire by helping them with the following skills: (1) enhance their ability to effectively communicate stress to the other partner (phase 1); (2) adapt their support to the specific needs of the other (phase 2); and (3) refine their ability to offer DC based on the partner's feedback (phase 3). Through this therapeutic method, the psychotherapist assumes the role of a coach that guides partners simultaneously, giving each one equal attention to better understand their own and their partner's responses to stressful events, namely, how maladaptive behaviors and personally relevant schemas or patterns of thought may be triggered by daily hassles and therefore cause stress; these insights may help partners build up a mutual understanding of emotional stress experiences for both partners and engage in adequate emotion and problem-focused support (dyadic coping), which, in turn, may strengthen their feelings of "we-ness" and fulfillment in the relationship.

These programs are supported by sound evidence of their efficacy in improving both individual and relationship outcomes (e.g., Bodenmann, 2016; Bodenmann et al., 2014; Bodenmann & Randall, 2012; Leuchtmann et al., 2018), and ongoing work by Guy Bodenmann and collaborators aims to test the efficacy of the Couples Care and Coping Program (CCC-P), an evidence-based program delivered to first-time parents, which combines the CCET with Couple CARE for Parents (CCP; Halford et al., 2010). Although the effectiveness of the CCC-P has not yet been evaluated, taken together, our results suggest that the adaptation of STM-derived interventions for expecting couples in Portugal also deserves special attention in further research.

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Application of the cognitive-behavior therapy principles in the development of e-mental health tools: The case of Be a Mom, a web-based psychological intervention to prevent postpartum depression • pág. 119-137
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Application of the cognitive-behavior therapy principles in the development of e-mental health tools: The case of Be a Mom, a web-based psychological intervention to prevent postpartum depression

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Abstract

E-mental health tools are a new format of treatment delivery that can increase population's access to mental health services. Its effectiveness is higher when grounded on evidence--based therapeutic protocols, such as Cognitive-Behavior Therapy (CBT). We aim to understand how CBT principles can be applied in the development of e-mental health tools, more specifically, in web-based interventions. We use the case example of the *Be a Mom* program, a web-based psychological intervention, grounded on the principles of CBT, designed to prevent postpartum depression and targeting high-risk postpartum women in the Portuguese population. We describe how the design of *Be a Mom* was grounded in CBT, by addressing: a) general CBT principles; b) its therapeutic mechanisms; and c) organization of sessions. Also, we discuss the relevance of the therapeutic alliance in web--based interventions and the importance of evidence-based interventions. By providing insight on how the principles of CBT can be operationalized in an innovative delivery format, we can contribute to the further development of web-based interventions, as well as to increase awareness and knowledge among mental health professionals about the similarities between the principles underlying web-based and face-to-face CBT interventions.

Keywords: *Be a Mom*, cognitive-behavior therapy, e-mental health, postpartum depression.

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Aplicação dos princípios da terapia cognitivo-comportamental no desenvolvimento de ferramentas e-mental health: O caso de *Be a Mom*, uma intervenção psicológica online para prevenir a depressão pós-parto

Resumo

As ferramentas e-mental health são um novo formato de aplicação de intervenções que potenciam o acesso da população aos serviços de saúde mental. A sua eficácia é maior quando são assentes em protocolos terapêuticos baseados na evidência, como a Terapia Cognitivo-Comportamental (TCC). Assim, procuramos compreender como os princípios da TCC podem ser aplicados no desenvolvimento de ferramentas de saúde mental, mais especificamente, em intervenções psicológicas *online*. Utilizámos o caso-exemplo do programa *Be a Mom*, uma intervenção psicológica *online*, assente nos princípios da TCC, concebida para prevenir a depressão pós-parto e destinada a mulheres em risco elevado no período pós-parto. Descrevemos como o *design* do *Be a Mom* foi fundamentado na TCC, considerando: a) princípios gerais da TCC; b) os seus mecanismos terapêuticos; e c) a organização de sessões. Também discutimos a relevância da aliança terapêutica em intervenções *online* e a importância de intervenções baseadas na evidência. Ao esclarecer como os princípios da TCC podem ser operacionalizados num formato inovador, podemos contribuir para o desenvolvimento de intervenções *online*, bem como para o aumento da consciencialização e do conhecimento nos profissionais de saúde mental sobre as semelhanças entre os princípios subjacentes às intervenções de TCC online e presenciais.

Palavras-chave: *Be a Mom*, terapia cognitivo-comportamental, e-mental health, depressão pós-parto.

E-MENTAL HEALTH TOOLS AS A WAY TO REDUCE THE TREATMENT GAP FOR MENTAL HEALTH DISORDERS: THE CASE OF POSTPARTUM DEPRESSION

Mental illness is a public health concern worldwide. Lifetime prevalence of mental disorders among adults ranges from 12.2% to 48.6% (World Health Organization International Consortium in Psychiatric Epidemiology, 2000). Portugal is one of the European countries with the highest prevalence of mental disorders, with data from the National Study of Mental Health showing that almost a quarter of the participants (22.9%) met criteria for the diagnosis of a psychiatric condition in the last 12 months (Almeida et al., 2013). Mental disorders are highly prevalent and highly disabling conditions, resulting in high socioeconomic costs for healthcare

systems and society at large (Lopez et al., 2006). However, despite its high impact, the treatment gap for mental disorders is still large across the world (Kohn et al., 2004).

This is also the case for postpartum depression (PPD), which is the most prevalent clinical condition in the postpartum period, affecting about 13% of Portuguese childbirth women (Maia et al., 2011). Untreated PPD poses adverse and long-term consequences for the mother (Woolhouse et al., 2014), the mother-child interaction (Field, 2010), and the infant's cognitive and socioemotional development (Slomian et al., 2019). However, despite the existence of effective treatments, few women with PPD seek professional help to address their mental health difficulties (McGarry et al., 2009). In a recent study conducted with the Portuguese population, only 13.6% of women presenting clinically relevant depression symptoms had sought professional help to address their symptoms (Fonseca et al., 2015), and this is related with knowledge (e.g., poor mental health literacy), attitudinal (e.g., stigma) and structural (e.g., time and financial constraints, struggles with transportation and childcare issues) barriers (Bina, 2008; Fonseca et al., 2015).

E-mental health tools (i.e., the use of the internet and related electronic communication technologies to deliver mental health information, services and care; Riper et al., 2010) are an innovative form of treatment delivery that can overcome some of the treatment barriers (e.g., stigma, structural barriers), given its reduced costs, flexibility and improved accessibility (Andersson & Titov, 2014). Therefore, e-mental health tools can be a form of outreach to individuals who may not access traditional face-to-face services (Taylor & Luce, 2003), as well as an appropriate way to scale-up preventive interventions for psychological disorders (Hayes et al., 2016). Considering the rapid growth and increased use of the internet and related electronic communication technologies during the last years, e-mental health tools can be an alternative or supplement to the more traditional delivery formats of psychological intervention (Barak et al., 2009).

One example of e-mental health tools is web-based psychological interventions. Web-based psychological interventions are highly structured intervention programs, based on evidence-based therapeutic protocols that are later operationalized and programmed to be administered via the internet (Mohr et al., 2013). The nature and content of the intervention protocols are similar to face-to-face interventions, although differences may be found in how information is delivered and in the communication with the therapist, which is often asynchronous (Andersson, 2015). Usually, these intervention programs attempt to create positive change and/or improve knowledge, awareness and understanding (about the problem) by providing (mental) health-related information materials and using interactive online components (Barak et al., 2009). There is evidence that web-based interventions have a greater likelihood of being acceptable and effective if they are grounded

in a theoretical background (Mohr et al., 2013), such as Cognitive-Behavioral Therapy (CBT).

In this paper, we will describe and discuss on how the principles of CBT can be applied in the development of web-based psychological interventions for the prevention and/or treatment of psychological disorders, particularly anxiety and mood disorders. As an illustrative example, we will describe how these principles underlie the development of a web-based psychological intervention to prevent postpartum depression among high-risk women in the Portuguese population: the *Be a Mom* program.

COGNITIVE-BEHAVIORAL PRINCIPLES APPLIED TO THE DEVELOPMENT OF E-MENTAL HEALTH TOOLS: THE CASE OF BE A MOM

CBT has been proven effective for the treatment of several mental disorders, namely mood and anxiety disorders (Butler et al., 2006). CBT has shown effectiveness as an individual face-to-face treatment, but it is also the psychotherapeutic model that almost exclusively has been transferred to other delivery formats such as guided self-help, telephone delivery and group treatment (Andersson, 2015). Moreover, there is prior evidence that CBT protocols tend to be easily operationalized in a web-based structured format (Cuijpers et al., 2008). Relying on a structured format which include therapists' treatment manuals and patients' materials, CBT was better suited than other psychotherapeutic models to be adapted to the web-based format (Hedman et al., 2012). There is evidence of the effectiveness of web-based psychological interventions to prevent and treat mood and anxiety disorders (Deady et al., 2017; Lal & Adair, 2014; van't Hof et al., 2009). There is also preliminary evidence on the effectiveness of web-based psychological interventions for perinatal mood disorders (Lee et al., 2016), suggesting its applicability to the perinatal period.

The *Be a Mom* program is a web-based, short-term, self-guided selective/indicated preventive intervention, grounded in the cognitive-behavioral therapeutic model (Fonseca, Pereira, et al., 2018), and incorporates the recent contributions of third-wave CBT approaches (e.g., self-compassion and acceptance and commitment therapy) applied to the perinatal context (Cree, 2015; Klausen, 2005). In this section, we will present and discuss how the design of the *Be a Mom* program was grounded in the cognitive-behavioral therapeutic model, in terms of: a) general CBT principles; b) cognitive-behavior therapeutic mechanisms underlying the intervention; and c) organization of sessions.

General CBT principles

The psychotherapeutic model of CBT grounds on some important key principles (Beck, 1995) that guide the development and implementation of the therapeutic protocols. These key principles are also applied in the development and implementation of web-based psychological interventions, such as the *Be a Mom* program.

1. *The focus of CBT is problem-oriented, with an emphasis on the present*. CBT main focus is on "here and now" problems and difficulties that are pertinent to the patient, which are described in specific terms, and in ways to resolving or reducing them, and improve the patient's current functioning and wellbeing (Beck, 1995). Web-based interventions target specific problems/conditions (e.g., depressive and anxiety symptoms, maladaptive health behaviors, social isolation) and their main objective is to enhance cognitive, behavioral and/or emotional change to deal with the problems experienced (Barak et al., 2009). The *Be a Mom* program was developed to prevent PPD among women who presented risk factors for this clinical disorder. Therefore, the *Be a Mom* program targets the challenges of a specific period (early motherhood) in women's life and it was designed to address both the promotion of CBT-based psychological processes/skills (e.g., emotion regulation abilities) and the minimization of risk factors (e.g., lack of social support, poor marital relationship) to prevent the development of a clinical diagnosis of PPD (Fonseca, Pereira, et al., 2018). Each of the modules addresses one or two specific thematic contents, as presented in Figure 1. It is important to note that the content of the modules is customized to the user's needs (e.g., content related to the promotion of the couple's satisfaction and intimacy is not displayed in case of single mothers; Fonseca, Pereira, et al., 2018).

Figure 1

Be a Mom: Structure and content

beamom

Changes and Emotional Reactions
- Changes and reorganizations during transition to parenthood
- Unrealistic expectations, role idealization and perfect motherhood
- Emotional experience: Identifying emotions
- CBT approach: Connection between thoughts and emotions

Managing Negative Thoughts
- Negative thoughts and their influence over emotions
- Reducing the power of thoughts: Questioning and defusion
- Self-criticism and self-compassion

Values and Social Support
- Parenthood values and commitment
- Social network: Identify support needs and ask for help
- Assertive communication

Couple Relationship
- Changes in the couple relationship during the postpartum period
- Assertive communication within the couple
- Sharing parenthood values and commitments

Risk, Symptoms and Asking for help
- Identify PPD signs and symptoms
- Professional help-seeking: treatment options and how to seek help
- A continuing journey: Planning for the future

2. *CBT is educative in nature*. CBT ultimately aims to teach patients to be their own therapists, by helping them to understand their current difficulties and to develop skills to address those difficulties (Beck, 1995). Web-based psychological interventions include didactic information to educate about different topics (e.g., the link between cognitions, emotions and behaviors) which may be presented through text but also using other multimedia options (e.g., pictures/graphics, animations, audio and video) to engage patients with the program (Barak et al., 2009). The *Be a Mom* comprises psychoeducative information about several topics (e.g., the changes occurring during the transition to parenthood and its emotional impact, the role of useful vs. non-useful cognitions, the changes in couple relationship) and it relies on different formats to provide such information, including text, animations, and audio files (with exercises). At the end of each module, a two-three minutes video is presented in which a mental health professional synthesizes the main content of the module (Fonseca, Pereira, et al., 2018). By using different multimedia tools, there is an increased likelihood of the information being understood by the patients, which may translate into a great ability to put the skills/changes into practice.

3. *CBT emphasizes collaboration and active participation*. CBT grounds on the establishment of a collaborative relationship between the patient and the therapist (collaborative empiricism) and on the active role of the patient to achieve therapeutic change (Beck, 1995). Web-based interventions rely on interactive tools (e.g., interactive exercises and experiences, self-monitoring), feedback and support tools (e.g., personalized feedback based on user responses, either displayed by automatic programming or with guidance by human technicians; Barak et al., 2009). In each module, the *Be a Mom* includes interactive exercises with personalized feedback to support learning concerning psychoeducative information. One example of exercise is the *Expected vs. Felt Emotions exercise*, where women were asked to identify how they imagined they would feel after the infant's birth (during pregnancy) and how they actually feel, with the aim of normalizing and identifying the diversity of women's emotional experience. Interactive exercises were also used to allow self-monitoring of particular aspects (e.g., *Thoughts Record exercise*, to understand the link between thoughts, emotions and behaviors) or to help to put into practice the strategies and skills that are implemented in session and are expected to be rehearsed by the women during the following weeks (e.g., *Valued Behaviors into Practice exercise*, which consists in selecting one behavior that is consistent with the women's parenting values and compromise to putting it into practice during the next week).

4. *CBT is a structured and time-limited treatment*. Given their problem-oriented and present-focus nature, CBT is per nature a time-limited treatment (Beck, 1995). Web-based interventions have a pre-determined number of modules, each addressing specific thematic contents (Kelders, 2012). Likewise, the *Be a Mom* program

has a modular setup, including five modules, each addressing one or two specific thematic contents (see Figure 1). The participants were instructed that they should complete one module per week, although a slower pace was also allowed, in light of the high caregiving requirements that women usually face in the early postpartum period. They were also given the option of pausing the module and resuming the last page visited during subsequent access (Fonseca, Pereira, et al., 2018).

Cognitive-behavior therapeutic mechanisms underlying the intervention

The rationale for the development of the therapeutic protocols for the prevention and treatment of emotional disorders grounds on the cognitive-behavioral understanding of the specific emotional disorder, including the factors that contributed to the occurrence of symptoms and for its maintenance over time (Beck, 1995; Beck et al., 1985; Beck et al., 1979), and this applies both to face-to-face and for web-based therapeutic protocols. The development of the *Be a Mom* program was grounded on the cognitive-behavioral comprehension of postpartum emotional disorders.

Cognitive-behavioral approaches for PPD (Milgrom et al., 1999; Wenzel & Kleiman, 2015) ground on the Beck's cognitive model for depression (Beck, 1987; Beck et al., 1979) and have postulated that: a) some women present biological and psychological vulnerability factors that put them at increased risk of experiencing emotional distress and of developing PPD; b) these vulnerabilities are often activated in times of stress, including the stress related with the caregiving demands after childbirth; and c) dysfunctional core beliefs (reflecting negative global judgments of the self, of others or of the future, e.g., "I am a failure" or specific judgments about maternal competence, e.g., "I'm not a good mother" or about what it means to be a mother, e.g., "I should be more dedicated to my baby") emerge from vulnerability factors and play an important role in the development of PPD (Wenzel & Kleiman, 2015). The specific motherhood-related beliefs are crucial in understanding the development of PPD, as there is evidence that depressive symptoms result from an interaction between specific types of dysfunctional beliefs and stress-inducing events that are congruent with the important components of these beliefs (Coyne & Whiffen, 1995). When activated by motherhood-related stress-inducing events, specific dysfunctional beliefs may influence the way women interpret the events, leading to the occurrence of negative automatic thoughts (Fonseca & Canavarro, 2018), which are associated with the maintenance and exacerbation of depressive symptoms. Moreover, the way in which women themselves and their support network (e.g., partner, family, friends) respond to their PPD symptomatology (e.g., thoughts, emotions) may contribute to exacerbate or maintain it. For example, the

women's negative responses to their symptoms may include negative cognitive (e.g., thoughts of parental inadequacy), affective (e.g., feelings of guilt, anger, anxiety, frustration) and behavioral (e.g., poor parenting skills, difficulties in mother-baby interaction, marital conflicts) responses (Milgrom et al., 1999), which may accentuate PPD symptoms. It is important to note that interpersonal maintenance factors are particularly relevant for PPD. The postpartum period is associated with significant changes and disturbances in interpersonal relationships (e.g., with partner, with parents, with friends), and women often describe discrepancies between desired levels of support and the support they actually receive in that period (O'Hara, 1994). Congruently, lack of social support and poor quality of marital relationship have been constantly identified as risk factors for the occurrence of PPD (Beck, 2001; Beck, 2002; Robertson et al., 2004).

Finally, Milgrom et al. (1999) also highlighted the important role of sociocultural factors, which can have an important role both in precipitating and in maintaining/exacerbating PPD. Examples of relevant sociocultural factors include unrealistic myths/expectations about motherhood (e.g., the myth of perfect motherhood or the joy of motherhood) and the lack of social support structures (due to the fact that many couples currently live apart from their families of origin, namely due to professional circumstances).

More recently, third-wave CBT approaches have added to the understanding of the occurrence of psychopathology, highlighting the important role of other constructs, such as self-criticism (*vs.* self-compassion; Gilbert, 2005) and psychological (in)flexibility (Hayes et al., 2006). Although third-wave CBT approaches have seldom applied to the perinatal context (Cree, 2015; Klausen, 2005), there is some recent research focusing on the role of such constructs in the maintenance of postpartum depressive symptoms.

On the one hand, there is some evidence that early negative experiences (e.g., critical and hostile interactions with attachment figures) may contribute to the development of a self-critical thinking style (i.e., intense and persistent form of internal dialogue that expresses hostility and contempt towards the self when one is unable to attain their self-imposed high-standards) that affects the individual's interpretation of events (Cree, 2015; Gilbert, 2005; Shahar, 2015). Women with a self-critical thinking style may feel unable to comply with their self-imposed high standards of "perfect motherhood" (Maia et al., 2012), which may translate into higher levels of postpartum negative automatic thoughts, a more negative evaluation of their thoughts as unwanted (i.e., metacognitive appraisal of their thoughts), which consequently may lead to higher depressive symptoms (Pedro et al., 2019). Conversely, a more self-compassionate attitude towards one's own suffering (Gilbert, 2005) has been associated with decreased self-criticism and with a non-judgmental approach to the

women's privative negative experiences (emotions and thoughts), which has been associated with less depressive symptoms (Cohen, 2010; Fonseca & Canavarro, 2018).

On the other hand, psychological inflexibility, which is a core concept in the Acceptance and Commitment Therapy (ACT) model, has been considered as an important transdiagnostic process associated with psychopathology, including depression (Levin et al., 2014). Psychological inflexibility may be defined as the "rigid dominance of psychological reactions over chosen values and contingencies in guiding action" (Bond et al., 2011, p. 678), which often occurs when individuals attempt to avoid experiencing unwanted internal events. Postpartum women with high self-imposed standards concerning the maternal role may have greater difficulties in accepting their private negative emotions and thoughts, being fused with such internal experiences (i.e., "If I think that I am a bad mother, this is because I am a bad mother") and engaging in experiential avoidance strategies (e.g., rumination, behavioral avoidance of activities with the baby because of fear that private internal experiences arrive; Fonseca, Monteiro, & Canavarro, 2018). Although these strategies may seem effective in short-term, they may begin to deviate women from engaging in behaviors that are in accordance with their parenting values (to avoid negative experiences), which in the long-term can lead to a perception of failure/ineffectiveness in their maternal role and translate into more depressive symptoms (Fonseca, Monteiro, & Canavarro, 2018; Li et al., 2016; Zhu et al., 2015). Conversely, the promotion of psychological flexibility – a self-regulatory skill in which individuals are able to regulate their emotions and actions despite the experience of unpleasant thoughts and feelings (Hayes et al., 2006) – has been considered a protective factor for the development of PPD (Monteiro et al., 2019).

In sum, the cognitive-behavioral approaches for PPD allow us to identify some modifiable targets of intervention (*vulnerability factors*) that should be addressed to prevent a clinical diagnosis of PPD: 1) Cognitive vulnerabilities, including dysfunctional beliefs about motherhood (e.g., role idealization and maternal responsibility) often grounded in sociocultural factors (the "myth of perfect motherhood") and a self-critical thinking style, which impact the way women interpret the events; 2) Non-acceptance of the diversity of internal experience (i.e., negative emotions and thoughts) during the postpartum period, which translate into cognitive (e.g., metacognitive appraisal of the thought's and emotion's content as inadequate), affective (e.g., guilt) and behavioral (e.g., avoidance) responses that increase the likelihood of negative thoughts and feelings, and prevent women from engaging in actions that are relevant to their parenting values; 3) Lack and/or inadequate social support; and 4) Poor quality of marital relationship. The *Be a Mom* program aims to address each one of these vulnerabilities in its modules. In Table 1, we describe the *Be a Mom's* goals for each module, and how they relate with these different vulnerabilities.

Table 1
Be a Mom *program: Modules, vulnerability factors address and goals*

Module	*Vulnerabilities addressed*	*Module's goals*
1 Changes & Emotions	Non-acceptance of the diversity of internal experiences Cognitive vulnerabilities (dysfunctional beliefs about motherhood and self-critical thinking style)	Educate about the changes and reorganizations (at the individual, familiar and social levels) during the transition to parenthood; Normalize the usual discrepancy between the women's expectations and the postpartum reality (in terms of changes/reorganizations), and promote the acceptance and coping with the characteristics of this life period; Normalize and identify the diversity of women's emotional experience, and promote its non-evaluative acceptance of the different emotions; Educate about the cognitive-emotional-behavioral link (understanding the relationship between thoughts, emotions and behaviors).
2 Cognitions	Non-acceptance of the diversity of internal experiences Cognitive vulnerabilities (dysfunctional beliefs about motherhood and self-critical thinking style)	Normalize and identify the occurrence of negative automatic thoughts in the postpartum period; Educate about the individual's cognitive functioning (e.g., how cognitive fusion and thoughts suppression strategies contribute to the maintenance and exacerbation of negative thoughts); Promote cognitive flexibility (e.g., acceptance and non-evaluative approach to previously avoided private experiences, cognitive defusion) and self-compassion as ways to deal with the women's private cognitive experience.
3 Values & Support	Non-acceptance of the diversity of internal experiences Lack and/or inadequate social support	Identify, create and clarify parenthood values, and making committed actions in accordance to those values; Reduce women's social isolation; Identify support needs, sources of support and activate practical and emotional support from others; Promote assertive communication skills.
4 Couple Relationship	Non-acceptance of the diversity of internal experiences Poor quality of marital relationship	Educate about the changes in couple relationship (e.g., intimacy and satisfaction, sexual relationship) during the transition to parenthood; Promote effective communication, negotiation and conflict management skills within the couple; Promote affection and intimacy within the couple; Normalize and accept differences in parenthood values within the couple and negotiate and commit with shared values.
5 Signs of PPD & Help-seeking		Educate about signs and symptoms of PPD, treatment options and its benefits; Develop a plan for professional help-seeking, in case of need. Prevent future difficulties and challenges, by identifying them and reflecting on how the learned skills may be used in future situations.

The cognitive-behavior therapeutic protocols often include a relapse prevention session by the end of treatment that aims to teach clients to anticipate and cope with the possibility of symptoms' relapse (Beck, 1995). In the *Be a Mom* program, this is targeted in the last module, where the occurrence of future motherhood-related challenges is discussed (e.g., first time the child is sick, return to work) and the women are encouraged to critically appraise the usefulness of strategies learned during the program and how these learned skills may help women to address those challenges. Finally, and given the preventive nature of the *Be a Mom* program and the importance to promote further professional help-seeking in the presence of clinically relevant postpartum depressive symptoms, the last module of *Be a Mom* also targets education about signs and symptoms of depression and promotes the development of a professional help-seeking plan in case of need (Fonseca, Pereira, et al., 2018).

Organization of sessions

CBT sessions are structured to increase the treatment efficiency, improve learning and focus therapeutic efforts on specific skills training (Beck, 1995; Fenn & Byrne, 2013). A CBT session usually begins with an agenda-setting process for the session and with a following up on the previous session's homework/tasks, after which the main thematic content of the session is addressed in a collaborative way between the therapist and the patient (e.g., through psychoeducative information, practical exercises, etc.). By the end of the session, the therapist revises the main contents of the session and usually assigns homework activities to extend the patient's efforts beyond the confines of the treatment session and to reinforce learning of CBT skills (Thase & Callan, 2006). Web-based interventions are usually organized into modules with a pre-defined structure (Andersson & Titov, 2014; Cuijpers et al., 2008) that includes the presentation of session goals, the main thematic content and the final review of the session. In the case of *Be a Mom*, each module begins with the presentation of the session goals, after which the main thematic content of the module is presented interchangeably with several interactive exercises. Specifically, psychoeducative information is combined with the presentation of practical strategies to be implemented and rehearsed by the women during the following weeks. The module ends with a brief summary of the module content (provided in a two-three minutes video by a mental health professional), an assessment of the relevance and utility of the module's content by the user, and with the presentation of a homework activity to guarantee therapeutic practice (Fonseca, Pereira, et al., 2018).

A NOTE ON THE THERAPEUTIC ALLIANCE

Although in CBT's past the therapeutic relationship (and its characteristics of warmth, genuineness and accurate empathy) was seen as necessary but not sufficient itself for positive change in therapy (Beck et al., 1979), it has been increasingly considered as one of the most valuable factors in therapy, suggesting that the use of both technical and interpersonal factors can result in favorable outcomes (Leahy, 2008). In web-based psychological interventions, the degree of contact with therapists may vary from unguided self-help programs (without assistance of a therapist) to guided self-help, with the regular support of a therapist (van't Hof et al., 2009). Communication with the therapist can be synchronous (i.e., that takes place in real time, e.g., telephone, chat) or asynchronous (e.g., email; Sucala et al., 2012). Unguided and guided web-based interventions have different advantages and disadvantages. Meta-analytic studies have shown that unguided/self-guided interventions show less promising results than guided web-based psychological interventions (Andersson & Titov, 2014; Cuijpers et al., 2010; Richards & Richardson, 2012), and one explanation for these results may be that the human support in guided interventions increases treatment adherence, leading to lower dropout compared to unguided/self-guided interventions (Karyotaki et al., 2015). On the other hand, self-guided interventions can reach a very large audience in a cost-effective way (Andersson, 2015), being adequate tools for preventive purposes.

The therapist alliance in web-based interventions has been also a matter of interest, although there are inconsistent findings concerning the importance of the therapeutic alliance for treatment outcomes (Andersson, 2015). In a recent review, the results supported similar levels of therapeutic alliance in web-based interventions compared to face-to-face interventions (Sucala et al., 2012). Congruently, it is important to note that, as mentioned by Andersson (2015), the development of a therapeutic alliance may not necessarily require direct face-to-face contact with a therapist, but may include other interactions (e.g., treatment interface components or text material) that can boost empathy and alliance.

The *Be a Mom* program is a self-guided intervention, so no direct contact with mental health professionals exists during the sessions. *Be a Mom* includes only asynchronous communication channels: reminders (sent by email if women go seven days without accessing the program) and an e-mail contact, mostly used for technical support. To improve user engagement within the program, *Be a Mom* includes one character – *the psychologist* – who presents the session goals and the key messages of each module and proposes exercises during the modules (Fonseca, Pereira, et al., 2018). In fact, when examining the perceptions of the

users, more than 80% of the women who had access to the program felt that the character (psychologist) helps them to feel a greater closeness to the program, and more than 60% of women reported that they have created a relationship of empathy and trust with the psychologist's character (Fonseca, Monteiro, Alves et al., 2018).

EVIDENCE-BASED NATURE OF INTERVENTIONS

Evidence-based interventions are treatments that have been proven effective (to some degree) through outcome evaluations. CBT has been investigated in fairly rigorous clinical trials and this has been replicated in web-based psychological interventions, showing the efficacy of web-based psychological interventions for the prevention and treatment of several emotional disorders (Deady et al., 2017; Lal & Adair, 2014; van't Hof et al., 2009), as previously mentioned.

The development of the *Be a Mom* followed an iterative formative evaluation process adapted from the Stage I of the Stage Model of Behavioral Therapies Research (Rounsaville et al., 2001), and including the methodological recommendations for the development of web-based behavioral interventions (Danaher & Seeley, 2009). The formative evaluation process included two phases: a) a scoping literature review to identify the main characteristics and therapeutic goals of existing preventive interventions for PPD; b) a focus group with mental health professionals working with the perinatal population, to identify the perceived needs of the stakeholders (Fonseca, Pereira, et al., 2018). The formative evaluation process led to the development of a preliminary version of the *Be a Mom*. A pilot randomized trial was conducted, including 194 postpartum women (intervention group: n = 98; control group: n = 96), to gather preliminary evidence of the *Be a Mom's* efficacy, as well as on its acceptability and feasibility. The results suggested that women in the intervention (*Be a Mom* group) experienced a significantly larger decrease in both depressive and anxiety symptoms from baseline to post-intervention compared to the control group, supporting the preliminary efficacy of the program. Although the dropout rates were about 60% (i.e., only 40% of women completed the program), the *Be a Mom* program was found to be a useful and relevant program among users (Fonseca et al., 2020). The user's perceptions about the different program features were also considered in the development of the final version of the *Be a Mom* program, which will be examined through a full powered randomized controlled trial to assess its (cost)-effectiveness.

CONCLUDING REMARKS

In this paper, we have tried to systematically present and discus how the principles of CBT can be applied to the development of web-based interventions, using the *Be a Mom* as a case example. This might be important, as the design of web-based interventions should be informed by psychotherapeutic models, in order to increase its acceptability and effectiveness (Mohr et al., 2013). A deeper understanding on how the general principles of CBT, its therapeutic mechanisms and organization of sessions could be operationalized in a different delivery format may contribute for the further development of web-interventions, but also to make mental health professionals more aware and knowledgeable about the similarities between the principles underlying web-based and face-to-face CBT interventions.

Moreover, e-mental health interventions have been increasingly recognized as a treatment delivery format that may widen the individual's access to effective treatments, by overcoming some of the treatment uptake barriers. However, the advantages of e-mental health tools are not limited to geographical convenience or instrumental circumstances (e.g., flexible schedule). The advances on research on the cost-effectiveness of e-mental health tools and the discussion about its potentialities *vs.* limitations and risks has highlighted the transversal role that technologies can play in the provision of psychological services, either as a sole option or in complementarity with face-to-face interventions (Andersson & Titov, 2014). However, this does not mean that web-based psychological interventions are the most adequate delivery format for every person. For example, the patient's familiarity with the internet, the severity/characteristics of the problem, or the efficacy of web-based interventions in the specific clinical condition should be some of the aspects to be considered when recommending web-based psychological interventions (Andersson, 2015). Currently, there is still limited knowledge about the characteristics that determine which patients are more suitable and benefit more from web-based interventions (Andersson & Titov, 2014). Moreover, important questions concerning web-based assessment and diagnosis (e.g., difficulties in checking and/or gathering additional information) and with therapeutic issues (e.g., therapeutic alliance) should also be considered. Taken these aspects into account, several international associations [e.g., American Psychological Association (2013), British Psychological Society (Berger & Skinner, 2009), Australian Psychological Society (2011)] developed specific guidelines for the use of e-mental health tools. Recently, the Portuguese Board of Psychologists also made available a set of recommendations for the use of information and communication technologies to deliver psychological services (Carvalho et al., 2019).

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The Interpersonal Mindfulness in Parenting Scale – Infant version:
Psychometric properties and factor structure in a sample of Portuguese mothers in the postpartum period • pág. 139-157
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The Interpersonal Mindfulness in Parenting Scale – Infant version: Psychometric properties and factor structure in a sample of Portuguese mothers in the postpartum period

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Abstract

The present study aims to explore the factor structure and psychometric properties of an adapted version of the Portuguese version of the Interpersonal Mindfulness in Parenting Scale for parents of infants aged 0 to 12 months (the IM-P-I). Two studies were conducted. The first study included 560 postpartum mothers and examined the factor structure and internal consistency of the IM-P-I. The second study included 295 postpartum mothers, with the goal of cross-validating the factor structure of the questionnaire and examining its internal consistency and construct validity. In both studies, the original correlated five-factor model (which included the subscales Listening with Full Attention, Emotional Awareness of the Child, Compassion for the Child, Self-Regulation in Parenting, and Nonjudgmental Acceptance of Parental Functioning) was the best-fitting model. Adequate Cronbach's alpha values were found for the total scale and for all subscales, except for the Emotional Awareness of the Child subscale. Moderate to strong negative correlations were found between the IM-P-I subscales and anxious and depressive symptomatology and emotional dysregulation. This study shows that the IM-P-I is a psychometrically adequate measure of mindful parenting in the postpartum period.

Keywords*:* mindful parenting; IM-P; infant; psychometric study

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A Escala de Mindfulness Interpessoal na Parentalidade – Versão bebé: Propriedades psicométricas e estrutura fatorial numa amostra de mães Portuguesas no período pós-parto

Resumo

O presente estudo teve como objetivo explorar a estrutura fatorial e as propriedades psicométricas de uma versão adaptada da versão em Português da Escala de Mindfulness Interpessoal na Parentalidade para pais de bebés de 0 a 12 meses (IM-P-I). Foram realizados dois estudos. O primeiro estudo incluiu 560 mulheres no período pós-parto e examinou a estrutura fatorial e a consistência interna do IM-P-I. O segundo estudo incluiu 295 mulheres no período pós-parto, com o objetivo de confirmar a estrutura fatorial do questionário e examinar a sua consistência interna e validade de constructo. Nos dois estudos, o modelo original de cinco fatores correlacionados (que incluiu as subescalas Escutar com Atenção Plena, Consciência Emocional da Criança, Compaixão pela Criança, Autorregulação na Relação Parental, e Aceitação Não Ajuizadora do Funcionamento Parental) foi o modelo que melhor se ajustou aos dados. Foram encontrados valores de alfa de Cronbach adequados para a pontuação total da escala e para todas as subescalas, exceto para a subescala Consciência Emocional da Criança. Foram encontradas correlações negativas moderadas a fortes entre as subescalas do IM-P-I e a sintomatologia ansiosa e depressiva e a desregulação emocional. Este estudo mostra que o IM-P-I é uma medida psicometricamente adequada para avaliar a parentalidade mindful no período pós-parto.

Palavras-chave*:* parentalidade mindful; IM-P; bebé; estudo psicométrico

INTRODUCTION

The term "mindful parenting" was introduced by Kabat-Zinn and Kabat-Zinn (1997) to describe the practice of intentionally bringing mindful awareness to everyday parent–child interactions and experiences (Bögels & Restifo, 2014; Kabat-Zinn & Kabat-Zinn, 1997). In general, mindful parenting can be defined as a parenting style that involves the ability to be compassionate with the self and with the child, aware of one's own emotions and of the child's emotions, and to be fully present and able to exert self-regulation in parent–child interactions (Duncan et al., 2009).

Duncan et al. (2009) proposed a theoretical model, according to which mindful parenting has a positive effect on the parent–child relationship and on the psychological functioning of both the parents and children because it involves the development of five important parenting skills: (1) listening to the child with full

attention (i.e., being fully present and giving complete attention to the child during parent-child interactions); (2) nonjudgmental acceptance of the self and the child (i.e., accepting the self as a parent and the challenges that parenting involves, as well as the characteristics and behaviors of the child); (3) emotional awareness of the self and the child (i.e., being able to notice and correctly identify one's own emotions and the child´s emotions during an interaction); (4) self-regulation in the parenting relationship (i.e., being able to pause before reacting in order to choose parenting behaviors that are in accordance with one's own values and goals); and (5) directing compassion toward the self as a parent and toward the child (i.e., being kind to the child and supportive of, sensitive to, and responsive to the child's needs).

Research on mindful parenting has been mainly conducted among parents of school-aged children and adolescents. For instance, mindful parenting has been found to be associated with higher quality parent–child relationships (e.g., Duncan et al., 2015), a more secure perception in the child of their relationship with their parents (Medeiros et al., 2016), more positive and adaptive parenting styles and practices (de Bruin et al., 2014; Gouveia et al., 2016), better well-being (Medeiros et al., 2016) and psychosocial functioning (e.g., Parent et al., 2016) in the child, and lower levels of parenting stress (Bögels et al., 2014; Bögels & Restifo, 2014; Gouveia et al., 2016) and self-critical rumination (Moreira & Canavarro, 2018). Mindfulness-based parenting programs for parents of children and adolescents, such as mindful parenting training (Bögels & Restifo, 2014), have also been shown to be efficacious in reducing parental stress, parental reactivity, children's and parents' psychopathological problems and in promoting parents' emotional regulation and psychological adjustment (Bögels et al., 2014; Bögels et al., 2010; Bögels & Restifo 2014; Meppelink et al., 2016).

In contrast, research on mindful parenting in the postpartum period is extremely limited. Some exceptions are the study of Laurent et al. (2017), which explored the effects of mindful parenting on cortisol levels in mothers and their infants in the first six months postpartum, and the study of Potharst et al. (2017), which examined the feasibility, acceptability and effects of mindful parenting group training for parents of babies up to 18 months old ("Mindful with Your Baby"). Although these studies support the benefits of promoting mindful parenting in the postpartum period, further studies are needed to better understand the protective role of this parental approach and the factors that can influence mindful parenting in this critical period. Therefore, mindful parenting assessment tools for the postpartum period are needed for research in this area to develop. In the studies by Laurent et al. (2017) and Potharst et al. (2017), adaptations of the Interpersonal Mindfulness in Parenting scale (IM-P; Duncan, 2007) were used. However, although Cronbach's alpha values in these studies were adequate for most of the subscales, to the best of our knowledge, the psychometric properties of these adaptations were not examined.

THE INTERPERSONAL MINDFULNESS IN PARENTING SCALE

The IM-P was developed by Duncan (2007) to assess mindful parenting among parents of children and adolescents. The initial 10-item version (Duncan, 2007) was later expanded to a 31-item scale aimed at assessing the five mindful parenting dimensions proposed in Duncan et al.'s (2009) mindful parenting theoretical model (i.e., Listening with Full Attention; Non-Judgmental Acceptance of the Self and Child; Emotional Awareness of the Self and Child; Self-Regulation in the Parenting Relationship; and Compassion for the Self and Child). Although the psychometric properties and factor structure of the original 31-item version were not investigated, other validation studies have examined its factor structure and psychometric qualities among different populations, including in the Netherlands (de Bruin et al., 2014), Portugal (Moreira & Canavarro, 2017), Hong Kong (Lo et al., 2018), Korea (Kim et al., 2018) and Mainland China (Pan et al., 2019). However, no study has been able to confirm the initially proposed 5-factor structure. The different versions of the IM-P vary in their number of items and their factorial structure, which may reflect that parenting behavior and meaning are embedded in the cultures. However, there are also some commonalities. All versions indicate that Compassion for the Self could not be integrated with Compassion for the Child as one factor, and include a factor of Listening/Interacting with Full Attention. In addition, almost all of them also include a factor of Compassion for the Child and Nonjudgmental Acceptance in Parenting/Parental functioning.

The factor structure and the psychometric properties of the Portuguese version of the IM-P were examined in three complementary studies that included parents of children and adolescents aged between 1 and 18 years old (Moreira & Canavarro, 2017). In the first study, the authors conducted an exploratory factor analysis in a sample of 300 mothers of children, which yielded a six-factor structure that was very similar to the factor structure of the Dutch version of the scale (de Bruin et al., 2014). The six factors were named: (1) Nonjudgmental Acceptance of Parental Functioning; (2) Self-regulation in Parenting; (3) Compassion for the Child; (4) Listening with Full Attention; (5) Emotional Awareness of the Child; and (6) Emotional Awareness of the Self. Factor 6 was excluded from the scale because it included only two items (items 3 and 6), with corrected item-total correlations below the recommendations ($\leq .30$), and presented an unacceptable Cronbach's alpha value ($\alpha = .42$). All the other subscales and the total score presented an adequate internal consistency (Cronbach's alpha values between .78 and .83), with the exception of the Emotional Awareness of the Child subscale, which presented a slightly lower Cronbach's alpha value than recommended ($\alpha = .69$). Therefore, the final version of the Portuguese version of the IM-P was composed of 29 items distributed across five subscales. In the second

study, confirmatory factor analyses in a different sample of mothers demonstrated that a correlated five-factor model and a hierarchical model had an acceptable fit to the data, supporting the utilization of the IM-P subscales and total score. The third study included mothers and fathers and examined the convergent validity of the scale. As expected, higher levels of mindful parenting were correlated with higher levels of parents' self-compassion. In addition, positive correlations were found between all IM-P subscales and the authoritative parenting style and negative correlations were found between all IM-P subscales and the authoritarian and permissive parenting styles.

THE PRESENT STUDY

As already mentioned, research on mindful parenting in the postpartum period is scarce, probably due to the lack of an adequate measure of mindful parenting for this particular period. The few studies in this period (Laurent et al., 2017; Potharst et al., 2017) used IM-P scale adaptations. However, to the best of our knowledge, the factor structure and other psychometric properties of these adaptations were not examined. Therefore, further studies examining the psychometric qualities of an adapted version of the IM-P for the postpartum period are needed. The existence of a properly adapted and validated instrument for this population will allow the development of this particular area of study and, consequently, a better understanding of the factors that may be related to the mindful parenting in the postpartum period and a better evaluation of the mindful parenting intervention outcomes in this period. Therefore, we developed an adapted version of the Portuguese IM-P that is appropriate for parents of infants aged up to 12 months (i.e., the IM-P-Infant). The goal of the present study is to examine the factor structure and the psychometric properties of the IM-P-I in two different studies.

STUDY 1

The first study aimed to examine the factor structure of the IM-P-I by exploring three models: 1) a one-factor model; 2) the five-factor correlated model found in the Portuguese validation study (Moreira & Canavarro, 2017); and 3) a hierarchical model with one second-factor (mindful parenting) and five first-order factors corresponding to each mindful parenting dimension of the Portuguese factor structure. The internal consistency of the scale was also examined. We expected to confirm

the five-factor structure found in the validation study of the Portuguese version of the scale (Moreira & Canavarro, 2017).

METHOD

Participants

The sample included 560 mothers of infants (52.5% males; n = 294) aged between 0 and 12 months (M_{age} = 5.29, SD = 3.14). Mothers had a mean age of 32.81 years (SD = 4.65, range = 18-46), and the majority were married or living with a partner (n = 535, 95.5%), had completed higher education (n = 534, 71.4%), were employed (n = 467, 83.4%), had a monthly household income less than 2000€ (n = 408, 72.9%), and lived in urban areas (n = 411, 73.4%), mainly from the Lisbon metropolitan area (n = 187, 33.4%), central Portugal (n = 158, 28.2%), and northern Portugal (n = 152, 27.1%). Most pregnancies were spontaneous (n = 524, 93.6%), planned (n = 426, 76.1%) and desired (n = 546, 97.5%) and developed with no obstetric complications in the mother (n = 393, 70.2%) or baby (n = 524, 93.6%).

Procedure

The IM-P-I was adapted from the Portuguese version of the IM-P (Moreira & Canavarro, 2017). Two authors of this study (D. F. and H. M.) independently adapted the questionnaire items so that they would be appropriate to parents of infants. After that, the two authors met to compare their versions and to obtain a comprehensible instrument that was conceptually consistent with the original but suitable for parents of infants. In the infant version of the questionnaire, the word "child" was replaced by the word "baby" in all items, and actions that implied verbal or cognitive abilities not yet present in infants younger than 12 months old were replaced by similar actions that did not imply these abilities. For instance, the item "I often react too quickly to what my child says or does" was modified to "I often react too quickly when my baby gets agitated or cries"; or the item "When my child misbehaves, it makes me so upset I say or do things I later regret" was replaced by "When my baby cries, becomes agitated or cranky, it makes me so upset I say or do things I later regret". In addition, some examples were provided in

several items so that the meaning of the item could be more easily understood. For instance, "When times are really difficult with my child, I tend to blame myself" was replaced by "When times are really difficult with my child (e.g., when it is difficult to calm him down, when he cries nonstop, when he has difficulty falling asleep), I tend to blame myself". Only item 4 ("I listen carefully to my child's ideas, even when I disagree with them") was deleted because no adaptation was deemed adequate. Therefore, the final version of the scale resulted in 28 items.

The sample was recruited online through a data collection website (LimeSurvey®) between December 2018 and January 2019 after approval from the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra. The only criteria to participate in the study were being Portuguese, being 18 years old or older, and having at least one child between 0 and 12 months old. Participants were invited to participate in a study about their opinions and preferences regarding a mindful parenting intervention in the postpartum period. The survey link was shared on social networks, including parenting forums and Facebook pages about parenting-related issues in the postpartum period. Several advertisements explaining the main goals of the study and containing the web link to the survey were posted on Facebook pages. The link was shared through unpaid cross-posting, through paid boosting campaigns, and through e-mail. The first page of the online protocol provided a brief description of the study objectives, the inclusion criterion, and the ethical issues of the study. The participants were assured that their participation in the study was anonymous and that no identifying information would be collected. Those who provided informed consent by clicking on the option "I understand and accept the conditions of the study" were granted access to the assessment protocol. If parents had more than one child, they were instructed to focus on their child aged between 0 and 12 months old when answering the questionnaires.

Measures

Sociodemographic and Clinical Information. Participants answered several questions regarding their sociodemographic background (e.g., age, marital status, educational level, employment status, and average monthly income) and obstetric information (e.g., maternal and fetal complications during pregnancy, type of delivery).

Mindful Parenting. The Portuguese IM-P-I contains 28 items scored on a five-point Likert response scale, ranging from 1 (*never true*) to 5 (*always true*). The items are distributed across five subscales, following the structure of the Portuguese IM-P version: (1) Listening with Full Attention (LFA; e.g., "I find myself paying little attention to my baby because I am busy doing or thinking about something else at the same time"); (2)

Compassion for the Child (CC; e.g., "I am kind to my baby when he/she is tearful, restless or upset with something"), (3) Non-Judgmental Acceptance of Parental Functioning (NJAPF; e.g., "I tend to criticize myself for not being the kind of parent I want to be"), (4) Self-Regulation in Parenting (SR; e.g., "When I'm upset with my baby, I notice how I am feeling before I take action"), and (5) Emotional Awareness of the Child (EAC; e.g., "It is hard for me to tell what my baby is feeling"). The subscale scores are the sum of the items, with higher scores indicating higher levels of the mindful parenting dimensions.

Data analyses

A CFA using maximum likelihood estimation was conducted in AMOS© 24 to test the adequacy of the factor structure of the IM-P-I. Three models were estimated: 1) a one-factor model; 2) a correlated five-factor structure, which presumes that the IM-P-I measures five different, but correlated, dimensions; and 3) a hierarchical model with five first-order factors and a single second-order factor of mindful parenting, which presumes that the dimensions of mindful parenting load on a general mindful parenting factor. The fit of the models was assessed through the comparative fit index (CFI), the Tucker-Lewis Index (TLI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). The cut-offs for adequate and good model fit were CFI values ≥ .90 and ≥ .95, RMSEA values ≤ .08 and ≤ .06, and SRMR values ≤ .10 and ≤ .08, respectively (Browne & Cudeck, 1993; Hu & Bentler, 1999). The Akaike information criterion (AIC; Akaike, 1987) was used to compare the models. The model with the smallest AIC values was considered the best-fitting model. A chi-square difference test was also computed to compare the model fit of different models and to determine whether a model had a significantly better fit to the data than another model. Factor loadings of .32 or above were considered meaningful (Tabachnick & Fidell, 2013). Cronbach's alpha values were obtained for each subscale and for the total score of the IM-P-I to explore its internal consistency.

RESULTS

Confirmatory factor analyses

As presented in Table 1, the one-factor model presented a poor fit to the data. Although the correlated five-factor model presented an acceptable fit to the data

[$\chi^2(340) = 937.15$, $p < .001$; CFI = .894; RMSEA = .056, 90% CI = [.052, .060], p = .010; SRMR = .055; AIC = 1069.15], modification indices were examined, suggesting that the errors in items 2 and 21, 2 and 8, 8 and 11, 15 and 20, 18 and 20, 25 and 27 might be correlated. Because these pairs of items belonged to the same factors, their measurement errors were allowed to correlate (Byrne, 2010). As presented in Table 1, the respecified model presented an adequate fit to the data, which was significantly better than the fit of the initial model [$\Delta\chi^2(6) = 56.52$, $p < .001$]. All standardized factor loadings for the items were significant ($p < .001$), ranging from .226 (item 10) to .806 (item 30).

Table 1
Goodness of fit statistics in Study 1 and Study 2

	Goodness of fit statistics						
	χ^2	*df*	*p*	CFI	SRMR	RMSEA	AIC
One-factor model							
Study 1	1985.83	350	< .001	.710	.078	.091, 90% CI = [.088, .095], p< .001	2097.83
Study 2	1218.85	350	< .001	.636	.088	.092, 90% CI = [.086, .098], p< .001	1330.85
Correlated 5-factor model							
Study 1	880.63	334	< .001	.903	.053	.054, 90% CI = [.050, .058], p = .059	1024.63
Study 2	555.22	334	< .001	.907	.063	.047, 90% CI = [.040, .054], p = .720	699.22
Second-order 5-factor model							
Study 1	919.22	339	< .001	.897	.056	.055, 90% CI = [.051, .060], p = .021	1053.22
Study 2	570.70	339	< .001	.903	.064	.048, 90% CI = [.041, .055], p = .659	704.70

The hierarchical model, in which the same errors were allowed to correlate, also presented an adequate fit. All first-order factors loaded significantly onto the general mindful parenting factor (standardized factor loadings were .848 for the subscale Compassion for the Child; .718 for the subscale Listening with Full Attention; .695 for the subscale Non-Judgmental Acceptance of Parental Functioning; .735 for the subscale for Emotional Awareness of the Child; and .954 for the subscale Self-regulation in Parenting), and all standardized factor loadings for the items were significant ($p < .001$), ranging from .227 (item 10) to .812 (item 31). The difference in the adjustment of the correlated and hierarchical models was significant [$\Delta\chi^2(5) = 38.59$, $p < .001$], suggesting that the correlated model seems to be a better representation of the IM-P-I factor structure.

Descriptive statistics and internal consistency

The means, standard deviations, and Cronbach's alpha values for the IM-P-I subscales and total scores are presented in Table 2. Cronbach's alpha values were adequate for the subscales Listening with Full Attention, Self-Regulation, Non-Judgmental Acceptance of Parental Functioning, Compassion for the Child, and for the total score. A lower Cronbach's alpha was found for the Emotional Awareness of the Child subscale.

Table 2
Means and standards deviations and Cronbach's alphas for IM-P-I subscales

	Study 1		Study 2	
	M (*SD*)	Cronbach's alphas	*M* (*SD*)	Cronbach's alphas
Listening with Full Attention	20.81 (3.01)	.84	20.38 (2.85)	.84
Emotional Awareness of the Child	11.48 (1.94)	.68	11.79 (1.70)	.58
Self-Regulation in Parenting	30.18 (4.57)	.75	30.97 (3.96)	.69
Nonjudgmental Acceptance of Parental Functioning	24.67 (4.90)	.77	24.76 (4.78)	.77
Compassion for the Child	22.12 (2.36)	.76	22.40 (2.10)	.70
Mindful Parenting Total Score	116.34 (12.75)	.90	110.19 (11.14)	.87

STUDY 2

The goal of the second study was to cross-validate the factor structure of the questionnaire in a different sample of postpartum mothers. This study was also intended to examine the evidence for the validity of the IM-P-I scores based on their associations with variables that are expected to be associated with mindful parenting (anxiety and depression symptoms and difficulties in emotion regulation) and on the differences between a group of mothers presenting clinically significant levels of anxiety and/or depression symptomatology and a group of mothers with normal levels of symptomatology. Based on previous investigations, we expected higher levels of mindful parenting to be associated with lower levels of anxiety and depression symptoms (e.g., Moreira & Canavarro, 2018) and with lower levels of emotion dysregulation (e.g., Gouveia et al., 2019; Moreira & Canavarro, 2020). We also expected to find higher levels of mindful parenting dimensions among mothers with normal levels of symptomatology.

METHOD

Participants

The sample included 295 mothers of infants (52.9% males) aged between 0 and 12 months (M_{age} = 6.98, *SD* = 3.45). Mothers had a mean age of 32.07 years (*SD* = 4.84, range = 19-47), and the majority were married or living with a partner (*n* = 279, 94.6%), had completed higher education (*n* = 188, 63.7%), were employed (*n* = 237, 80.3%), had a monthly household income less than 2000€ (*n* = 217, 73.6%), and lived in urban areas (*n* = 216, 73.2%) mainly from central Portugal (*n* = 126, 42.7%), the Lisbon metropolitan area (*n* = 73, 24.7%), and northern Portugal (*n* = 60, 20.3%). Most pregnancies were spontaneous (*n* = 280, 94.9%) and developed with no obstetric complications in the mother (*n* = 222, 75.3%) or baby (*n* = 283, 95.9%).

Procedure

The sample of Study 2 was collected online (*n* = 262, 88.8%) and in four nurseries of the central region of Portugal (*n* = 33, 11.2%), between December 2018 and February 2019. The study was approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra and by the directors of the nurseries that collaborated in the study. The only criteria to participate in the study were being Portuguese, being 18 years old or older, and having at least one child between 0 and 24 months old. Participants were invited to participate in a study about their emotional experiences in the first two years after the birth of a child. The procedures for online data collection were similar to the procedures described in Study 1. Participants recruited from nurseries received a letter explaining the study (study aims, inclusion criteria, and institutional background), an informed consent form, and the questionnaires from the child's kindergarten teacher. Mothers were asked to complete the questionnaires at home and to return them completed within one week. Of the 235 potential participants, 139 (59.15%) mothers completed the questionnaires. For the purpose of this study, 104 questionnaires corresponding to mothers of children over 12 months of age were excluded. In addition, two questionnaires corresponding to mothers of other nationalities were also excluded, which resulted in a final sample of 33 participants (11.2% of the total sample).

No significant differences were found between mothers recruited online and those recruited from nurseries in terms of level of education [$\chi^2(1) = 0.61$, $p = .435$], marital

status [$\chi^2(1) = 2.13$, $p = .144$], professional status [$\chi^2(1) = 2.63$, $p = .105$], household monthly income [$\chi^2(1) = .522$, $p = .470$], place of residence [$\chi^2(1) = 3.02$, $p = .082$], infant gender [$\chi^2(1) = .041$, $p = .839$], mother's age, [$F(1, 251) = 1.14$, $p = .287$], mother-related obstetric complications [$\chi^2(1) = 0.01$, $p = .943$], and infant-related obstetric complications [$\chi^2(1) = 2.63$, $p = .105$]. Likewise, no significant differences were found in mindful parenting dimensions, Wilk's Lambda = .988, $F(5, 289) = 0.71$, $p = .619$.

Measures

Mothers completed a sociodemographic form and the IM-P-I described in Study 1 in addition to measures of anxiety and depression symptoms and difficulties in emotional regulation.

Anxiety and Depressive Symptoms. The Portuguese version of the Hospital Anxiety and Depression Scale (HADS; Pais-Ribeiro et al., 2007; Zigmond & Snaith, 1983) was used to assess levels of depressive and anxious symptomatology in the previous week. This scale contains 14 items and uses a four-point Likert scale that ranges from 0 (*not at all/only occasionally*) to 3 (*most of the time/a great deal of the time*), with higher scores indicating higher levels of symptomatology. Scores between 0 and 7 are considered "normal"; between 8 and 10, "mild"; between 11 and 14, "moderate"; and between 15 and 21, "severe". According to Snaith (2003), scores of 11 or higher indicate the possible presence ("caseness") of clinically significant symptomatology. In this sample, the Cronbach's alpha coefficients were .82 for anxiety and .81 for depression.

Difficulties in Emotion Regulation. The Portuguese version of the Difficulties in Emotion Regulation Scale - Short Form (DERS-SF; Kaufman et al., 2015; Moreira et al., 2020) was used to assess difficulties in emotional regulation or dysregulation. The scale consists of 15 items (e.g., "When I'm upset, I feel guilty for feeling that way"; "When I'm upset, I have difficulty concentrating"), answered on a five-point Likert scale that ranges from 1 (*almost never*) to 5 (*almost always*). The total score consists of the mean of the items, with higher scores indicating more difficulties in regulating emotions. In the current study, Cronbach's alpha was .90.

Data analyses

Following the procedures described in Study 1, a CFA using maximum likelihood estimation was conducted in AMOS© 24. The same three models that were already tested in Study 1 were tested in Study 2 to cross-validate the factor structure of

the IM-P-I. The internal consistency of the scale was assessed through Cronbach's alpha, which was obtained for each subscale and for the total score. The validity of the IM-P-I scores, based on their relation to variables expected to be associated with mindful parenting, was explored. Correlations around .10 were considered small; correlations near .30 were considered medium; and correlations of .50 or higher were considered large (Cohen, 1988). Based on the HADS cutoff scores, two groups were created: 1) a group with normal/mild anxiety and depression symptoms (HADS scores < 11 in both subscales; Normal symptomatology group); and 2) a group with clinically significant levels of anxiety and/or depression symptoms (HADS anxiety and/or depression scores ≥ 11; Clinically significant symptomatology group). Differences between the study variables across the groups were analyzed through MANOVA (for mindful parenting dimensions) and ANOVA (for the total score).

RESULTS

Confirmatory factor analyses

As presented in Table 1, the one-factor model presented a poor fit to the data. In contrast, the correlated five-factor model presented a good fit to the data. All standardized factor loadings for the items were significant ($p < .001$), ranging from .188 (item 10) to .796 (item 23). The hierarchical model also presented an adequate fit. All first-order factors loaded significantly on the general mindful parenting factor (standardized factor loadings were .798 for the subscale Compassion for the Child; .673 for the subscale Listening with Full Attention; .593 for the subscale Non-Judgmental Acceptance of Parental Functioning; .579 the subscale for Emotional Awareness of the Child; and .972 for the subscale Self-regulation in Parenting), and all standardized factor loadings for the items were significant ($p < .001$), ranging from .189 (item 10) to .795 (item 23). The difference in the adjustment of the correlated and hierarchical models was significant [$\Delta\chi^2(5) = 15.48$, $p = .008$], which means that the correlated model seems to be a better representation of the IM-P-I factor structure.

Descriptive statistics and internal consistency

The means, standard deviations, and Cronbach's alpha values for the IM-P-I subscales and total scores are presented in Table 2. Cronbach's alpha values were

adequate for the subscales Listening with Full Attention, Non-Judgmental Acceptance of Parental Functioning, Compassion for the Child, and for the total score. Lower Cronbach's alpha values were found for the subscales Emotional Awareness of the Child and Self-Regulation.

Validity evidence of the IM-P-I scores in relation to other variables

As presented in Table 3, moderate to strong negative correlations were found between all IM-P-I dimensions and the total score and symptoms of anxiety and depression and emotion dysregulation.

Table 3
Correlations between IM-P-I subscales and other measures in Study 2

	Depression symptoms	Anxiety symptoms	Emotion dysregulation
Listening with Full Attention	-.26**	-.29**	-.34**
Emotional Awareness of the Child	-.30*	-.26**	-.21**
Self-Regulation in Parenting	-.33**	-.39**	-.40**
Nonjudgmental Acceptance of Parental Functioning	-.48**	-.61**	-.54**
Compassion for the Child	-.25**	-.21**	-.25**
Mindful Parenting Total Score	-.48**	-.56**	-.54**

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

Comparison analyses of mindful parenting as a function of mothers' anxiety and depression symptoms

The majority of mothers reported normal or mild levels of anxiety and/or depression symptoms ($n = 233$, 78.98%; "Normal symptomology group"), and only 21.02% ($n = 62$; "Clinically significant symptomatology group") reported clinically significant levels of symptomatology (i.e., scored ≥ 11 on one or both of the HADS subscales). Levels of mindful parenting dimensions were compared between groups (see Table 4). The multivariate effect was significant [Wilk's Lambda = 0.76, $F(5, 289) = 18.17$, $p < .001$]. Significant differences were found in all mindful parenting dimensions, with mothers presenting clinically significant levels of anxiety and/or depressive symptoms reporting lower levels of all mindful parenting dimensions than mothers with normal levels of symptomatology.

Table 4
Comparison analyses as a function of anxiety and depression symptoms in Study 2

	No symptoms group $n = 233$	Clinically significant symptomatology group $n = 62$	
	M (*SD*)	*M* (*SD*)	Comparison analyses
Listening with Full Attention	20.73 (2.68)	19.04 (3.11)	$F(1, 293) = 17.5s1$, $p < .001$
Emotional Awareness of the Child	11.95 (1.64)	11.18 (1.77)	$F(1, 293) = 10.45$, $p = .001$
Self-Regulation in Parenting	31.47 (3.63)	28.63 (4.35)	$F(1, 293) = 27.53$, $p < .001$
Nonjudgmental Acceptance of Parental Functioning	25.93 (4.28)	20.37 (3.97)	$F(1, 293) = 84.98$, $p < .001$
Compassion for the Child	22.58 (2.05)	21.69 (2.15)	$F(1, 293) = 9.05$, $p = .003$
Mindful Parenting Total Score	112.27 (9.90)	100.19 (11.14)	$F(1, 293) = 66.28$, $p < .001$

DISCUSSION

The goal of the present study was to explore the factor structure and the psychometric properties of an adapted version of the Portuguese version of IM-P (Moreira & Canavarro, 2017) for parents of infants aged zero to 12 months (the IM-P-I). To this end, the questionnaire items of Portuguese IM-P were adapted to be suitable for parents of infants. The final version resulted in 28 items that were conceptually consistent with the original scale.

The results of the confirmatory factor analyses conducted among two independent samples of mothers in the postpartum period confirmed the adequacy of the expected five-factor structure of the Portuguese scale. Both the correlated five-factor model and the hierarchical model presented an acceptable fit to the data in both studies, which is consistent with the results from the study examining the factor structure of the Portuguese IM-P (Moreira & Canavarro, 2017). However, consistent with the abovementioned study, the correlated five-factor model presented a better fit and, thus, seems to be a better representation of the IM-P-I factor structure.

The IM-P-I showed good internal consistency, with adequate Cronbach's alpha values for the total scale and for almost all the subscales, except for the Emotional Awareness of the Child subscale, which presented lower Cronbach's alpha values (α = .68 in Study 1 and α = .58 in Study 2). This finding is consistent with the results presented in the validation study of the Portuguese version of the IM-P (Moreira & Canavarro, 2017), in which this subscale also presented a lower Cronbach's alpha value (α = .69) compared to the other subscales. A possible reason is that this subscale comprises a smaller number of items than the other subscales.

Supporting the construct validity of the scale, significant and moderate to strong negative correlations were found between the IM-P-I subscales and the total score and measures of anxious and depressive symptomatology. This result is consistent with the results found in the validation studies of the Portuguese (Moreira & Canavarro, 2017) and Chinese (Pan et al., 2019) versions of the scale. It is also in accordance with previous studies that demonstrated that lower levels of mindful parenting are significantly correlated with higher symptomatology levels (Moreira & Canavarro, 2018). It is interesting to note that the strongest negative correlation was found between anxiety and depression symptoms and the Nonjudgmental Acceptance of Parental Functioning subscale. Because the judgment and non-acceptance of parental function are essentially ruminative and self-critical processes, this strong correlation was expected, since self-criticism and rumination are core processes of psychopathology.

Also supporting the validity of the IM-P-I scores, significant and moderate to strong negative correlations were found between the IM-P-I subscales and total score and emotional dysregulation, which is also in accordance with previous studies (e.g., Gouveia et al., 2019; Moreira & Canavarro, 2020). Self-Regulation in the Parenting Relationship and Nonjudgmental Acceptance of Parental Functioning, in particular, were the subscales that correlated more strongly with emotion dysregulation. These results suggest that emotion regulation is a fundamental aspect in the parents' relationship with the child and in the self-to-self relationship. That is, mothers with more adaptive emotion regulation skills seem to be able to adaptively regulate their emotions and behaviors in the interactions with their children, as well as be less critical of their parental role and, therefore, more compassionate and tolerant with their mistakes or limitations as mothers.

Comparison analyses showed that mothers with clinically significant levels of anxious/depression symptoms reported lower levels of all mindful parenting dimensions. This result is consistent with previous investigations in parents of children and adolescents showing that parents who exhibit clinically significant levels of psychopathology symptoms have a greater difficulty in adopting a mindful parenting style (Moreira & Canavarro, 2018) and struggle to engage in optimal

parenting (e.g., Lovejoy et al., 2000). Therefore, these results support the validity of this version of the scale and its ability to discriminate parents with and without clinically significant levels of psychopathology symptoms.

Limitations, Contributions and Conclusions

The present study has some limitations. First, the IM-P-I was only administered once; thus, we were not able to determine the test–retest reliability of the IM-P-I. Second, the sample only included mothers, which precluded the generalization of the results to fathers. Third, although the total score and most subscales presented adequate Cronbach's alpha values, the Emotional Awareness of the Child subscale presented a Cronbach's alpha value below the recommendations. Although some authors have argued that Cronbach's alpha values of .60 are acceptable in research in the social sciences (Aron et al., 2013), some caution should be used when interpreting the results obtained with this subscale. Fourth, the sample of Study 1 and most of the sample of Study 2 were recruited online, which may compromise the representativeness of the samples, as online recruitment is often associated with a self-selection bias (i.e., parents who participate in an online study tend to be more interested in the study theme and to be more motivated to complete the questionnaires).

However, despite these limitations, this study represents an important contribution to the measurement of mindful parenting in the postpartum period. Research on mindful parenting in the postpartum period is scarce, and this may be due, in part, to the scarcity of appropriate assessment tools of mindful parenting for this particular period. Therefore, we believe that the present study, by showing that the IM-P-I is a psychometrically adequate measure of mindful parenting in mothers of infants aged zero to 12 months, will contribute to the growth of scientific research in mindful parenting in the postpartum period.

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A course on cognitive and behavioural interventions for sleep disorders within a master degree programme in clinical and health psychology: The first triennium experience • pág. 159-177
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A course on cognitive and behavioural interventions for sleep disorders within a master degree programme in clinical and health psychology: The first triennium experience[1]

Ana Allen Gomes[2]

Abstract

Given the prevalence of sleep disorders, the efficacy and effectiveness of behavioural and cognitive interventions, mainly CBT for insomnia, we consider that a course on the topic should be introduced within the psychology master degree programmes. Since 2017/18 we are offering the optional course: *Psychological Interventions on Sleep Disorders*. The present work summarizes the course syllabus and analyses the students' perceptions regarding the first three editions. One hundred and twenty psychology master degree students have voluntarily registered at the course. End-of-semester online institutional anonymous questionnaires were voluntarily completed. Participants were asked to rate the course in a variety of parameters using a 5-point scale (1 = minimum; 5 = maximum). Ninety questionnaires were completed. Mean scores on each item (addressing: bibliography/other learning materials; quality of learnings; learning results; non-redundancy concerning other courses; theoretical-practical articulation; students' active participation in the learning processes; development of analytical and critical reflection/thinking skills; overall self-assessment) ranged between 4.23 and 4.46, items' mean score = 4.35. Students' perceptions on the first three semesters of the course were clearly encouraging. By offering a course on behavioural interventions for sleep disorders at master degree level, we hope to contribute to increase its delivery in health contexts in the near future.

Keywords: cognitive-behavioural therapy, psychology master degree, insomnia, sleep disorders, behavioural sleep medicine.

1 An earlier version of the current work has been presented at the congress of the World Sleep Society - World Sleep 2019 - held in Vancouver, Canada, September 20-25, and the respective abstract has been published in a supplement number of the journal Sleep Medicine (cf. Gomes, 2019). The congress presentation related expenses were partially funded by the CINEICC - FCT R&D Unit, and FPCE-UC.

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Experiência de uma disciplina sobre intervenções cognitivo-comportamentais nas perturbações de sono, no âmbito da formação de mestres em psicologia clínica e da saúde: Resultados do primeiro triénio

Resumo

A prevalência de perturbações de sono e os dados sobre eficácia e efetividade das terapias comportamentais e cognitivas justificam a criação de uma disciplina dirigida a mestrandos em psicologia clínica e da saúde. Desde 2017/18, oferecemos a disciplina opcional "Intervenções Psicológicas nas Perturbações do Sono". O presente trabalho pretende apresentar e contextualizar esta disciplina e analisar os primeiros resultados dos inquéritos aos estudantes. Cento e vinte mestrandos em psicologia inscreveram-se na disciplina nos três primeiros anos, dos quais 90 submeteram anonimamente a sua avaliação, preenchendo *online* (em local e horário extra-aula) os questionários institucionais da Universidade de Coimbra. Cada item incidia num determinado aspeto da disciplina (numa escala de 1 = mínimo a 5 = máximo). As pontuações médias dos itens (contemplando: bibliografia/materiais de apoio; qualidade das aprendizagens; resultados da aprendizagem; não redundância face a outras disciplinas; articulação entre teóricas e práticas; participação ativa no processo de aprendizagem; desenvolvimento de competências; avaliação global da disciplina) variaram entre 4.23 e 4.46, média global = 4.35. Os resultados dos três primeiros anos foram claramente encorajadores. Ao oferecermos esta disciplina durante a formação de mestrado a futuros psicólogos clínicos, esperamos fomentar a tão necessária oferta da terapia cognitivo-comportamental na insónia e ainda noutros problemas de sono.

Palavras-chave: terapia cognitiva-comportamental, mestrado em psicologia, insónia, perturbações de sono, medicina comportamental do sono.

INTRODUCTION

Disturbed sleep affects a large portion of individuals. Among sleep disorders, insomnia is the most prevalent. According to the International Classification of Sleep Disorders-3, the full clinical syndrome of chronic insomnia affects around 10% of the adult population, and transient insomnia affects a much larger portion of the population, 30%-35% (American Academy of Sleep Medicine [AASM], 2014). Regarding insomnia treatment, cognitive-behavioural therapy for insomnia, known as CBT-I (as described e.g., by Bootzin & Epstein, 2011; Clemente, 2006; Edinger & Carney, 2015; Espie & Kyle, 2012; Manber & Carney, 2015; Marques et

al., 2016; Morin, 1993; Morin & Espie, 2003), has been recognized as the first line treatment, given the robust research evidence from randomized controlled trials, meta-analyses and systematic reviews (e.g., Brasure et al., 2016; Van Straten et al., 2018; Zweerde et al., 2019), consistently supporting the efficacy and effectiveness of this treatment approach (cf. Morin et al., 2017). Not surprisingly, based on research evidence, CBT has been recommended as standard treatment for insomnia disorder by the American Academy of Sleep Medicine (e.g., Schutte-Rodin et al., 2008), as the first line treatment for adult chronic insomnia by the European Sleep Research Society (Riemann et al., 2017), as the initial treatment to be offered to all insomnia patients by the American College of Physicians (Qaseem et al., 2016), and as a psychological treatment with strong research support according to the Society of Clinical Psychology, Division 12 of the American Psychological Association [APA] (cf. https://www.div12.org/treatment/cognitive-behavioral-therapy-for-insomnia/).

In addition to CBT-I, a variety of other treatments within the scope of behavioural and cognitive therapies have been developed for other sleep disorders and problems, identified within the sleep field as behavioural sleep treatments (cf. Perlis et al., 2011). As examples, one may mention behavioural interventions to prevent childhood sleep problems (such as parental management of bedtime); the controlled crying/comforting protocol to deal with persistent settling/waking difficulties in young children (Cortese et al., 2015); behavioural sleep interventions to treat clinical insomnia in children (e.g., unmodified extinction; graduated extension; bedtime pass, positive routines, cf. Roane & Taylor, 2013); image rehearsal therapy for nightmare disorders (Krakow, 2011); wake up time conditioning or "schedule awakenings" for parasomnias (cf. Ivanenko & Larson, 2013) such as sleepwalking and night terrors (Byars, 2011; Lask, 1988); "Moisture Alarm Therapy" for primary nocturnal enuresis (Warzak & Friman, 2011); CBT to improve compliance to ventilotherapy in Obstructive Sleep Apnoea (Bartlett, 2011); scheduled sleep periods (naps) as an adjuvant therapy to cope with narcolepsy daytime symptoms (Rogers, 2011); structuring sleep-wake schedules, promoting sleep hygiene practices, and avoiding bright light exposure in the evening for delayed sleep phase syndrome (Abbott et al., 2017); light therapy and chronotherapy for circadian rhythm disorders in general (such as shift work disorder, jet lag disorder, cf. Auger et al., 2015; Drake & Wright, 2017).

Even though the efficacy/effectiveness of CBT for insomnia is well-stablished, it contrasts with its low delivery (insomnia is underdiagnosed; and few patients are offered the CBT-I treatment). Low delivery has been a concern shared by many (e.g., Buenaver et al., 2019; Harvey & Buysse, 2018; Manber & Simpson, 2016; Perlis & Smith, 2008), and several possible solutions have been proposed (e.g., to integrate education on sleep and sleep disorders in the current psychology curriculum at

both the undergraduate and graduate levels, including during placements, cf. Ellis (2012), or internships, cf. Meltzer et al. (2009); to provide intensive training endorsed by sleep societies for individuals with masters-level credentials in mental health, cf. Fields et al. (2013), and Perlis & Smith (2008); to disseminate a transdiagnostic approach as proposed by Harvey & Buysse (2018) based on several cognitive and/or behavioural evidence-based treatments that were previously mentioned). Recently, in an effort to promote the implementation and dissemination of CBT-I, a Task Force of the European Sleep Research Society (ESRS) and the European Insomnia Network is working on deliberations and established a European CBT-I Academy to enable standardized training and accreditation training centre (Baglioni et al., 2020).

Despite the expressed concerns and efforts to accredit sleep specialists and to offer post-graduation training courses to professionals, higher education institutions' programmes barely include normal sleep and sleep disorders in their psychology syllabus at the master degree level (cf. Ellis, 2012; see also Baglioni et al., 2020). This gap has been documented in clinical psychology graduation programs and professional internships (Meltzer et al., 2009); therefore, mental health students and professionals usually complete their degrees, internships or specialties, without benefiting from any learning about CBT for insomnia or other sleep disorders. We consider that future mental health professionals currently receiving instruction on CBT for a variety of disorders (such as anxiety, mood, obsessive-compulsive, and eating disorders, usually integrated in the master degrees curriculum), should also be given the opportunity to be instructed during their master degree level on the fundamentals of behavioural and cognitive interventions for sleep disorders (or, at least, for insomnia disorder). (Ideally, and agreeing with Ellis (2012), the study of sleep/sleep psychology should be incorporated in the psychology curriculum since the undergraduate level).

In sum, given the prevalence of sleep disorders, the efficacy and effectiveness of cognitive behavioural interventions for a variety of sleep problems, in particular cognitive-behavioural therapy for insomnia/CBT-I, and the need to promote its dissemination and delivery, we believe it is advantageous to incorporate a course on this topic within the master degree programmes in psychology dedicated to train those who will be the future licensed mental health professionals in cognitive-behavioural therapies.

By offering master degree level training for psychology students on the CBT track, who are potential upcoming providers, we hope to contribute to the important effort of disseminate and increase delivery of CBT for insomnia and sleep disorders in general.

Therefore, at our University, within the master degree in clinical psychology, we are offering one semester optional course called Psychological Interventions for Sleep Disorders (*Intervenções Psicológicas nas Perturbações do Sono*) (Planned designation in future editions: Cognitive-Behavioural Therapies for Sleep Disorders/*Terapias*

Cognitvo-Comportamentais nas Perturbações de Sono). The aims of the current work were twofold: (i) to describe the course syllabus in a summarized way; (ii) to analyse the students' perceptions about the course based on the three first editions completed so far, relying on the pedagogical surveys conducted at the university.

THE COURSE

A summary of the course syllabus is presented in Table 1. The course is an optional/elective curricular unit offered in the first semester of the master degree in Psychology of the Faculty of Psychology and Educational Sciences of the University of Coimbra, specialty in Clinical and Health Psychology, area of expertise in Cognitive-Behavioural Interventions in Psychological and Health Disorders.

Table 1
Summary of the course syllabus

Designation Psychological Interventions in Sleep Disorders/(Proposed designation in future editions: Cognitive-Behavioural Therapies for Sleep Disorders)
Description This is an optional course integrated in the master degree programme in psychology of the University of Coimbra, specialty of clinical psychology, area of expertise in Cognitive-Behavioural Interventions in Psychological and Health Disorders. As prerequisites, students are supposed to possess basic notions on cognitive-behavioural models acquired in the first cycle of psychology. The course aims essentially to convey to master degree students, particularly to those specifically interested in Cognitive-Behavioural Therapies (CBT), the fundamentals of CBT for sleep disorders.
Learning Outcomes As a result of this course, students are expected: • To describe normal sleep patterns across life span, and acknowledge inter-individual differences on sleep patterns; • To characterize sleep disorders (SD) (e.g., insomnias; parasomnias; disorders of the circadian sleep-wake rhythm), especially those of greater relevance for clinical psychologists; • To become familiar with the main classification/diagnostic systems, especially DSM-5 and ICSD-3 (international classification of SD); • To understand the cognitive-behavioural conceptualization for chronic insomnia; to apprehend psychological conceptualizations for other SD; • To describe the main assessment methods used by sleep expert psychologists; • To become familiar with "sleep hygiene" rules; • To understand the behavioural, cognitive and non-pharmacological interventions for specific SD, such as (among others): insomnia (cognitive-behavioural therapy); nightmares and other parasomnias (e.g., image rehearsal therapy); shift work, delayed sleep-phase and remaining disorders of the circadian sleep-wake rhythm (e.g., light therapy).

Table 1
Summary of the course syllabus (cont.)

Contents overview
1. Defining sleep and the circadian sleep-wake cycle. Normative sleep-wake patterns across life span. Normal inter-individual differences.
2. Sleep Disorders and its classification (DSM-5; ICSD-3).
3. Symptoms, prevalence, aetiology, and development of SD, emphasizing the most relevant ones in clinical psychology.
4. Influential psychological models for insomnia (e.g., stimulus control model; 3Ps model / currently 4 Ps; micro-analytic model).
4.1. Other psychological conceptualizations for SD.
5. Main assessment methods used by sleep psychologists (clinical interview; scales and inventories, e.g., ISI, DBAS, PSQI, ESS; sleep diaries; actigraphy).
6. Starting the intervention: Sleep education and "sleep hygiene".
7. Behavioural, cognitive and non-pharmacological interventions for specific SD:
• insomnia (e.g., CBT);
• nightmares, sleep walking, night terrors, other parasomnias (e.g., image rehearsal therapy);
• shift work, delayed sleep-phase, other circadian rhythm sleep-wake disorders (e.g., chronotherapy; light therapy);
• narcolepsy/hypersomnolence disorders (e.g., naps' scheduling);
• sleep-related breathing (e.g., CPAP adherence therapy) and movements' disorders.
8. Prevention and intervening from infancy: promoting healthy sleep; behavioural interventions for paediatric insomnia.

Teaching / instructional methods
Classes begin with oral lectures, accompanied by slides. Thereafter, video presentations, internet sites, printed documents, etc, are used to illustrate and promote debate on specific concepts. For each SD, a clinical case is presented and discussed (e.g., excerpts of clinical histories). Furthermore, a specialist might be invited to develop on a specific topic or case discussion. Students also have the opportunity to visit the Sleep Medicine Centre at the Coimbra University Hospital Centre.

Assessment methods
1 written examination (midterm exam) (70%) + 1 field team work (30%)

Sample of essential references [to avoid repetitions, only citations are indicated here, and the complete references may be found at the end of the article]*
• American Academy of Sleep Medicine [AASM] (2014).
• Carskadon & Dement (2017).
• Hauri (n.d.).
• Moorcroft (2013).
• Morin et al. (2017).
• Morin & Espie (2012).
• Perlis et al. (2011). (Eds.).
• Perlis et al. (2017).
• Zucconi & Ferri (2014).

* Important complementary references are further recommended during classes.
Cf. https://apps.uc.pt/courses/EN/unit/85242/13423/2019-2020?type=ram&id=1174

Note. DBAS = Dysfunctional Beliefs and Attitudes about Sleep (Morin, 1993, 1994; Portuguese version: Clemente, 2013). The remaining scales identified through initials in the table are mentioned in the text.

The curricular unit comprises 6 ECTS (Bologna format) and 3.5 hours of classes per week are offered (1.5 hours being predominantly theoretical, plus two hours predominantly practical).

The learning outcomes and the content topics selected (indicated in Table 1) were inspired in great part on the definition and conceptualization of the specialty of sleep psychology recognized in 2013 by the American Psychological Association and in our previous clinical experience in sleep disorders consultation within a mental health clinic. However, differently from a professional specialty, this course is being offered at a master degree level, and not as a post-graduation one (even though we are not training sleep specialists, those who conclude this course will be much more prepared to accomplish, in the future, the remaining requisites in order to pursue such specialty). This way, we hope that the future clinical psychologists with expertise in cognitive-behavioural therapies who completed the curricular unit will have acquired a solid background on CBT for insomnia and other sleep problems and be prepared to pursue an internship at a sleep disorders clinic/laboratory.

Given that the course has been offered within the context of a master degree specifically focused in cognitive-behavioural interventions, students have the opportunity to develop, in other curricular units, a solid background for an in-depth understanding of cognitive-behavioural therapies (e.g., at the level of assessment, case formulation, and CBT protocols, in what concerns anxiety disorders, depression, obsessive-compulsive disorders, among others). Also importantly, all teaching staff at this master degree consists of integrated researchers at the Centre for Research in Neuropsychology and Cognitive and Behavioural Intervention (CINEICC) (funded by the Portuguese Foundation for Science and Technology), which has been rated with the highest possible classification in the most recent assessment by an international independent panel. As such, there is an intimate interaction between research and clinical practice.

Also of foremost importance, there are cooperation protocols formalized between the Faculty/University, and the Coimbra University Hospital Centre (CHUC), including an agreement between the Master Degree in Clinical and Health Psychology – Cognitive-Behavioural Interventions, and the Sleep Medicine Centre of the afore mentioned Hospital so that, at the second year of the master degree, two students may complete their annual curricular psychology internship at that Centre. This Sleep Medicine Centre, one of the largest in our country, comprises a multidisciplinary team (e.g., pneumology/pulmonology; neurology; psychiatry; psychology; technician), and all professionals are Sleep Specialists by the ESRS. Students doing the curricular internship benefit from the contact with all categories of sleep disorders requiring psychological intervention under the supervision

of the local psychologist who is simultaneously specialist on clinical and health psychology, and on behavioural sleep medicine.

In sum, the curricular unit is offered in a privileged curricular context, i.e., within a pre-professionalizing master degree in psychology specifically focused in cognitive-behavioural therapies, associated to a research centre dedicated mainly to CBT, rated with the highest possible classification, followed in the last curricular year by the opportunity of doing the curricular internship at a Sleep Medicine Centre associated to a University Hospital Centre.

The option is mainly dedicated to the students of the specific area of expertise of the master degree programme (i.e., CBT track); however, students in other master degree specialties may also choose the unit.

The assessment methods listed in Table 1 deserve some further details here, as they are related to the learning outcomes and to the teaching methods. In addition to an individual end-of-semester examination (comprising ~ 50 multiple choice questions), there is a practical written assignment developed by students in small groups. More specifically, for the practical assignment, students are invited to complete individually and in an anonymous way a sleep diary (*Consensus* Sleep Diary) for one to two weeks (Carney et al., 2012; Portuguese translation: Marques & Gomes, 2012), the Pittsburgh Sleep Quality Index [PSQI] (Buysse et al., 1989; Portuguese version validation study: Gomes et al., 2018), a questionnaire on sleep quality plus sleep-wake schedules and durations devised by the responsible for the unit (Gomes et al., 2015; Miller-Mendes et al., 2019); the Insomnia Severity index [ISI] (Morin, 1993; Bastien et al., 2001; Portuguese version/validation: Clemente, 2007; Clemente et al., 2017; Clemente et al., 2021); the Glasgow Sleep Effort Scale (Broomfield & Espie, 2005; Portuguese version: Meia-via et al., 2016), the Epworth Sleepiness Scale [ESS] (Johns, 1991; Portuguese version and main studies: Santos et al., 2001; Guimarães et al., 2012; Sargento et al., 2015); the Stop-Bang (Chung et al., 2008; Portuguese version/validation: Pereira et al., 2013; Reis et al., 2015); and the Composite Morningness Scale [CMS] (Smith et al., 1989; Portuguese version/successive psychometric studies: Silva et al., 1995/ Buekenhout et al., 2019; Gomes, 2005; Gomes et al., 2016; Silva et al., 2016), among other possibilities. These tools are introduced gradually, accompanying the contents addressed in class, each week (e.g., the CMS is administrated following the normal inter-individual differences in sleep-wake patterns topic; the ISI is introduced during the insomnia classes). After completing each instrument, students are given scoring instructions and information on how to interpret the data. This way, students have the opportunity to gain knowledge on some of the main self-report measures used in research and especially in clinical practice by sleep psychologists/behavioural sleep medicine specialists as valuable assessment tools to complement clinical interview and/or to monitor treatment outcomes.

METHODS

Participants

A total of 120 psychology master degree students have voluntarily registered at the course during the first three editions, specifically 32 at the first edition (2017/18) plus 41 at the second one (2018/19), and 47 in the academic year of 2019/20 (third edition of the course).

Measures and procedures

Data on students' perceptions about the course was collected via institutional university anonymous questionnaires assessing the pedagogical aspects of the course (i.e., standardized online questionnaires applicable to all curricular units, distributed at the end of the semester, by the University of Coimbra).

Items used in the present study ask participants to assess the course in a variety of parameters, each rated in a 5-point scale ranging from 1 to 5, higher scores representing better quality. Questionnaire items examined for the present work were the following ones:

E. Recommended bibliography and other learning materials;
F. Overall quality of learnings;
G. Learning results;
H. Non-redundancy concerning curricular contents of other courses;
I. Articulation between theoretical and practical contents within the course;
J. Active participation of the students in the learning processes;
K. Development of analysis and critical reflection/thinking skills;
L. Students overall self-assessment.

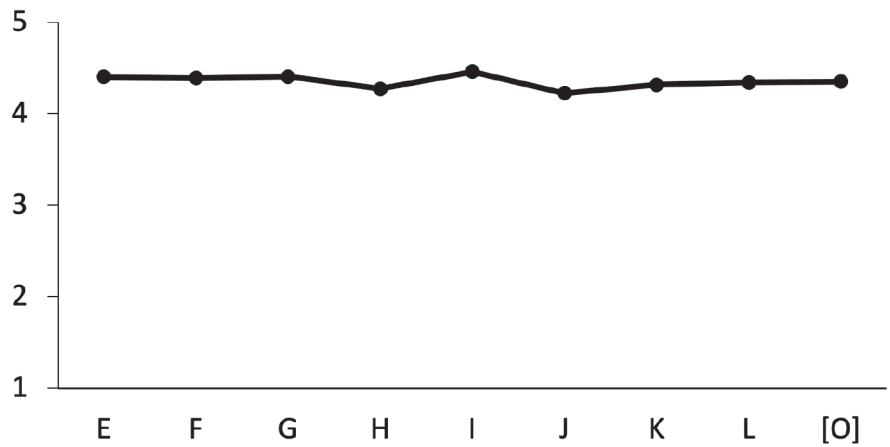
Based on the data available separately for each academic year, we combined them in order to obtain altogether values for frequencies, means and modes. The "comments" section of the pedagogical questionnaires was also examined. This section consists of an "open box" where students may write any comment if they want. This is an optional, non-compulsory, section.

RESULTS

A total of 90 master degree students (75%) out of 120 completed the voluntary pedagogical surveys, 23 on the first edition, 26 on the second one, and 41 in the third one.

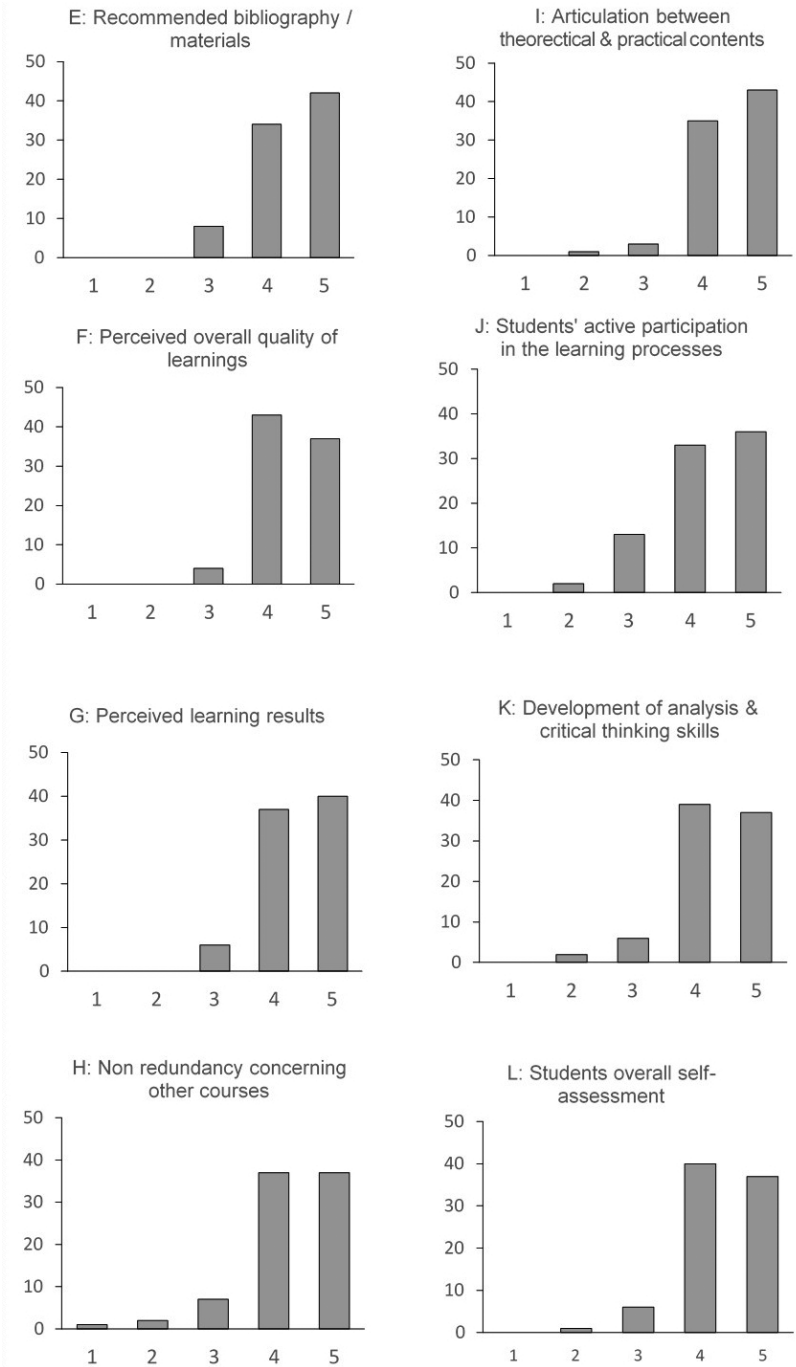
Mean scores on each item ranged between 4.23 and 4.46 (Figure 1) with most students' answers (90.7%) falling in the categories 4 or 5 (Figure 2). Overall mode was 5, and overall inter-item average score was 4.35 (4.51 at the first edition; 4.15 at the second edition; 4.40 at the third edition).

Figure 1
Students' mean ratings for each course parameter (combining 2017/18, 2018/19, and 2019/20 editions)



Through the inspection of Figure 2, one may find that mode values reached 5 points in what concerns the recommended bibliography and other learning materials distributed (item E), articulation between theoretical and practical components of the course (item I), perceived learning results achieved by students (item G), and active participation in the learning processing (item J); mode values were both 4 and 5 for non-redundancy of the course contents relatively to other ones (item H). In the remaining three items, the mode was 4 – F (overall perceived quality of learnings), K (critical thinking analysis skills), and L (students' overall self-assessment).

Figure 2
Detailed response distribution in each item (rated 1 to 5)



Finally, the anonymous comments (optional section of the questionnaire) were also examined. There was a total of six comments. As to positive comments to the syllabus and course dynamics, we may emphasise the following ones:

- "The contents lectured were very interesting, well structured, and well selected. The classes were dynamic, there were clearly theoretical and practical parts, both always well organized. The idea to visit the Sleep Medicine Centre was very positive, providing us, for the first time in this school year, an approximation to the places and professionals in the area. (...) Overall, I consider this course to be the one that I evaluate most positively, and therefore I would recommend it for the next year" [2017/18 edition].
- "The visit to the Sleep Medicine Centre of the CHUC was extremely interesting, and one of the scarce opportunities that I myself had until the moment, to get in touch with the psychological practice in real contexts" [2017/18 edition].
- "Very complete and interesting curricular unit. It offers a rich perspective of sleep disorders and their possible treatments, being this an essential tool in our future. Although they are dense classes, with a lot of content, they become accessible by the fact that the subject is exposed in an objective way and taught by someone with a lot of knowledge in the area. Still about the teacher, she has always been very willing to clarify any doubts and provide the necessary help, and it is also to value her effort to bring ex-students to class, with the aim of getting us closer to the practical reality of Sleep Psychology" [2019/20 edition].

As to negative comments, the following one deserves mentioning [2017/18 edition]: "Some specific contents were also addressed at the Curricular Unit of Cognitive-Behavioural Interventions in Adults-I, becoming somewhat uninteresting for students".

DISCUSSION AND CONCLUSION

Results on the first three semesters of the course were very encouraging according to students' perceptions, considering the mean and mode values. In addition, the number of students choosing this curricular unit has been rising each academic year.

In spite of the global positive assessments, there is still room for improvement particularly in what concerns the perception of students about their overall quality of learnings, their active participation in the learning processes, their overall self-assessment, and their perceived development of analysis and critical

thinking skills (items with mode values = 4, or sporadic values below 3). Besides, the master degree programme is now being restructured, and, therefore, in the future, the course will be offered at the second semester of the academic year, instead of its current placement at the first semester. This change will make it possible to solve the small overlap that currently some students experience regarding CBT-I due to a shortened version of this specific topic being currently taught in another course called Cognitive-Behavioural Therapies in Adults-I. Thus, in future academic years, it will be possible to firstly introduce the basics about CBT-I during the compulsory course Cognitive-Behavioural Therapies in Adults-I so that, at the second semester, we may offer an expanded and detailed approach to CBT-I at the optional course of CBT for sleep disorders. As to the designation of the course, in the future editions, it will be relabelled "Cognitive-Behavioural Therapies for Sleep Disorders".

By offering a course on CBT-I and behavioural interventions for sleep disorders at the master degree level, we believe we are contributing to disseminate this therapy and to increase the number of potential providers (upcoming clinical psychologists) and, in this way, we hope to increase the delivery of these treatments to patients in the near future. We are also contributing to improve the screening, detection and referral competencies of future mental health specialists in what concerns sleep disorders.

This is only one of the several possible ways to disseminate CBT-I and other empirically supported psychological therapies and evidence-based treatments for sleep disorders (e.g., a larger discussion of possibilities may be found in Perlis & Smith, 2008). In spite of the current existence of other ways of training mental health providers (e.g., at the University of Pennsylvania at the USA), apparently there has been a scarce offer of this kind of courses within existing graduate programs (cf. Baglioni et al, 2020, for a tentative overview of the present situation in European countries). We hope our positive experience of implementation will encourage similar courses to start within other master degrees programmes in clinical & health psychology focused in cognitive-behavioural therapies training.

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