

Generalized anxiety symptoms and life satisfaction: The mediator role of repetitive negative thinking

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Abstract

This study examines the mediating role of repetitive negative thinking in the relationship between generalized anxiety symptoms and life satisfaction. A web survey was administered to 857 participants (365 men) who filled out a sociodemographic questionnaire, the Generalized Anxiety Disorder-7, the Persistent and Intrusive Negative Thoughts Scale, and the Satisfaction with Life Scale. Then, participants were divided into four groups according to levels of symptomatology. The results showed that scores for repetitive negative thinking increased due to the severity of generalized anxiety symptoms. For life satisfaction, individuals without generalized anxiety symptoms scored significantly higher than individuals with generalized anxiety symptoms. Furthermore, repetitive negative thinking mediates and explains over 54% of the relationship between generalized anxiety symptoms and life satisfaction when controlling for age, sex, clinical diagnosis, and current psychiatric medication. Overall, the current findings highlight the central role of repetitive negative thinking in the relationship between generalized anxiety symptoms and life satisfaction and reinforce a transdiagnostic process in the maintenance of anxiety symptomatology and well-being impairment.

Keywords: generalized anxiety; life satisfaction; mediation; repetitive negative thinking.

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Sintomas de ansiedade generalizada e satisfação com a vida: O papel mediador do pensamento repetitivo negativo

Resumo

Este estudo tem como objetivo avaliar o papel mediador do pensamento repetitivo negativo na relação entre os sintomas de ansiedade generalizada e a satisfação com a vida. Um questionário online foi administrado a 857 participantes (365 homens) que preencheram um questionário com informação sociodemográfica, a Perturbação de Ansiedade Generalizada-7, a Escala de Pensamentos Negativos Persistentes e Intrusivos, e a Escala de Satisfação com a Vida. Posteriormente, os participantes foram divididos em quatro grupos de acordo com os níveis de sintomatologia. Os resultados revelaram que os níveis de pensamento repetitivo negativo aumentam em função da severidade dos sintomas da ansiedade generalizada. Indivíduos sem sintomas de ansiedade generalizada pontuaram significativamente mais na satisfação com a vida comparativamente a indivíduos com sintomas de ansiedade generalizada. O pensamento repetitivo negativo mediou e explicou 54% da relação entre os sintomas de ansiedade generalizada e a satisfação com a vida, quando controladas as variáveis idade, sexo, diagnóstico clínico e medicação psiquiátrica atual. Os resultados do presente estudo enfatizam o papel central que o pensamento repetitivo negativo apresenta na relação entre os sintomas de ansiedade generalizada e a satisfação com a vida, e reforça o papel dos processos transdiagnósticos na manutenção dos sintomas de ansiedade e o prejuízo no bem-estar.

Palavras-chave: ansiedade generalizada; satisfação com a vida; mediação; pensamento repetitivo negativo.

INTRODUCTION

Anxiety disorders are highly prevalent and place a significant burden on mental health services (Kessler, 2000; Kroenke et al., 2007), with repeated visits to emergency rooms and medical services (Deacon et al., 2008; Koivumaa-Honkanen et al., 1999). According to the World Health Organization (WHO, 2022a, b), before the COVID-19 pandemic, approximately 970 million people were living with a diagnosis of a mental disorder, of whom 301 million had an anxiety disorder. After the COVID-19 pandemic (WHO, 2022a, b), a 26% increase in the number of people with anxiety disorders was observed, showing the negative impact of anxiety currently. One of the most common anxiety disorders is generalized anxiety disorder (GAD), characterized by excessive worry and intolerance of uncertainty, physical anxiety symptoms, and significant impairment in general functioning (APA, 2013; Kessler, 2000; Massion et al., 1993). As a disabling mental disorder, GAD was often comorbid with other anxiety and mood problems, particularly major depressive disorder (Kessler, 2000; McEvoy et al., 2015).

Individuals with generalized anxiety symptoms often exhibit excessive worry characterized by recurrent and repetitive thoughts and worries about upcoming negative events and situations related to health, family, social relationships, and the world in general (APA, 2013; Kessler, 2000; McEvoy et al., 2015). Thus, worry has been defined by repetitive thoughts about future and potentially negative events (Ehring & Watkins, 2008; Hur et al., 2017; Watkins et al., 2005) and posited as a core dimension in the generalized anxiety conceptualization (Ehring & Watkins, 2008).

Although worry has been theoretically and empirically established as a key feature associated with the occurrence and maintenance of generalized anxiety symptomatology (Ehring & Watkins, 2008; Hur et al., 2017; Watkins et al., 2005; Vislă et al., 2022), a broader conceptualization of repetitive negative thinking (RNT) may have a greater impact on anxiety and mood disorders and, in particular, GAD (McEvoy & Mahoney, 2013; Spinhoven et al., 2015). RNT has been conceptualized as a pattern of thinking characterized by repetitive, intrusive, and difficult-to-resolve thoughts (Ehring et al., 2011), with negative cognitive content about past and future events predominating (McEvoy et al., 2015). Moreover, RNT was not only theorized as a risk factor for anxiety disorders but has also been described and empirically validated as a transdiagnostic process that includes worry and repetitive thinking patterns, such as rumination, among other dimensions (Topper et al., 2010).

Psychotherapeutic interventions targeting RNT in individuals with a clinical diagnosis of GAD showed a decrease in psychopathological symptoms and RNT frequency (McEvoy et al., 2015; Newby et al., 2014; Ruiz et al., 2019) and an improvement in quality of life (McEvoy et al., 2015). From cognitive-behavioral

psychotherapy (McEvoy et al., 2015) to action and commitment therapy (Ruiz et al., 2019) or metacognitive therapy (Newby et al., 2014), empirical evidence suggests that psychotherapeutic interventions that address RNT as a transdiagnostic process involved in the emergence and maintenance of generalized anxiety symptomatology help to promote cognitive flexibility and achieve significant reductions in generalized anxiety symptoms and RNT, thereby improving overall mental health and well-being.

The increasing interest of psychotherapeutic programs in promoting well-being and life satisfaction, in addition to symptom reduction, has led empirical researchers to include quality of life and well-being measures in their clinical efficacy studies (Bourland et al., 2000).

Life satisfaction has been considered an important characteristic of individual well-being and an indicator of societal well-being, development, and progress (Lombardo et al., 2018). The experience of happiness also encompasses cognitive and affective dimensions, including life satisfaction and positive emotions (Pavot & Diener, 2008). Life satisfaction can be described as a representation of the cognitive dimension of well-being and happiness (Diener et al., 2013; Diener et al., 2003), describing the cognitive assessment a person makes when comparing their standard of living to their current life (Pavot & Diener, 1993, 2008). In addition, life satisfaction also included self-perceived satisfaction with a variety of domains such as health, work, family, leisure, social relationships, or well-being (Rojas, 2006), which have been closely related to mental health (Fergusson et al., 2015; Lombardo et al., 2018). The negative relationship between life satisfaction and well-being and psychopathological symptoms has been extensively studied in the literature (Mahmoud et al., 2012; Serin et al., 2010; Zhang et al., 2022), with studies suggesting that the presence of an anxiety disorder, particularly generalized anxiety symptomatology, as a negative predictor and a risk factor for impaired life satisfaction (Beutel et al., 2009; Bourland et al., 2000; Massion et al., 1993; Shear & Mammen, 1997; Stein, 2001; Stein & Heimberg, 2004). Individuals with generalized anxiety symptomatology had increased emergency room visits, negatively affecting well-being and life satisfaction (Koivumaa-Honkanen et al., 1999). Moreover, life satisfaction was significantly lower in patients with a clinical diagnosis of GAD compared to mentally healthy individuals (Bourland et al., 2000), and impairment in life satisfaction has been associated with symptom severity (Bourland et al., 2000; Shear & Mammen, 1997). The impairment in life satisfaction and relationship strain associated with a clinical diagnosis of GAD appears independent of other comorbid psychiatric conditions, such as mood disorders (Stein & Heimberg, 2004), underscoring the psychological and relational burden of generalized anxiety.

Empirical studies have shown that symptoms of generalized anxiety were a negative predictor of life satisfaction and subjective well-being (Beutel et al., 2009; Bourland et al., 2000; Koivumaa-Honkanen et al., 1999; Shear & Mammen, 1997; Stein, 2001; Stein & Heimberg, 2004). RNT as a transdiagnostic process involved in the maintenance of emotional disturbances, including generalized anxiety symptomatology (McEvoy & Mahoney, 2013; Spinhoven et al., 2015), and negatively related to life satisfaction (Magson et al., 2019; Peixoto & Cunha, 2021), may act as a mediating variable in the relationship between generalized anxiety symptoms and life satisfaction. Although previous research has examined the mediating role of various forms of RNT, such as rumination, in the relationship between psychopathology and subjective well-being (Dempsey et al., 2019), a lack of empirical evidence has been found for the mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction. Therefore, this study aims to investigate the mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction. It also aims to investigate the differences between RNT and life satisfaction in individuals as a function of generalized anxiety symptoms severity. The hypothesis is that RNT will significantly mediate the relationship between generalized anxiety symptoms and life satisfaction. It is also expected that, as a function of the severity of generalized anxiety symptoms, RNT scores will increase, and life satisfaction will decrease.

METHOD

Participants

This study used a nonrandom convenience sample of 857 Portuguese adults from the community. Of them, 365 were male (42.6%), and 492 (57.4%) were female, with a mean age of 31.77 years ($SD = 10.60$, range = 18-73 years). Most participants had 13 or more years of formal education ($n = 556$; 64.9%) and were single ($n = 544$; 63.5%). The majority did not have a mental disorder diagnosis ($n = 694$; 81%) and were not currently ($n = 817$; 95.3%) or in the past ($n = 470$; 54.8%) receiving psychiatric or psychological treatment. However, most were under pharmacological treatment for mental disorders ($n = 488$; 56.9%). Sociodemographic data can be found in Table 1.

To achieve the main objectives of this study, individuals were divided into four different groups according to the severity of symptomatology assessed with the GAD-7 (Sousa et al., 2015; Spitzer et al., 2006). Individuals who scored less than four points were assigned to a group without generalized anxiety symptoms,

individuals who scored between five and nine points were assigned to a group with mild generalized anxiety symptoms, individuals who scored between 10 and 14 points were assigned to a group with moderately severe generalized anxiety symptoms, and individuals who scored more than 15 points were assigned to a group with severe generalized anxiety symptoms. Sociodemographic data for each group are shown in Table 1.

Table 1*Sociodemographic characterization of the sample (N = 857)*

	Total sample (N = 857)	No GAD symptoms (n = 258)	Mild GAD symptoms (n = 341)	Moderate GAD symptoms (n = 167)	Severe GAD symptoms (n = 91)
	n (%)	n (%)	n (%)	n (%)	n (%)
Sex					
Male	365 (42.6)	138 (53.5)	144 (42.2)	57 (34.1)	26 (28.6)
Female	492 (57.4)	120 (46.5)	197 (57.8)	110 (65.9)	65 (71.4)
Education					
4 years	2 (0.2)	1 (0.4)	0 (0)	1 (0.6)	0 (0)
6 years	1 (0.1)	0 (0)	0 (0)	1 (0.6)	0 (0)
9 years	134 (15.6)	56 (21.7)	41 (12.0)	26 (15.6)	11 (12.1)
12 years	164 (19.1)	30 (11.6)	77 (22.6)	35 (21.0)	22 (24.2)
13 years or more	556 (64.9)	171 (66.3)	223 (65.4)	104 (62.3)	58 (63.7)
Marital status					
Single	544 (3.5)	130 (50.4)	224 (65.7)	116 (69.5)	74 (81.3)
Married/in cohabitation	265 (30.9)	114 (44.2)	92 (27.0)	44 (26.3)	15 (16.5)
Divorced/separated	45 (5.3)	14 (5.4)	22 (6.5)	7 (4.2)	2 (2.2)
Widower	3 (0.4)	0 (0)	3 (0.9)	0 (0)	0 (0)
Clinical diagnosis					
No	694 (81.0)	240 (93.0)	289 (84.8)	118 (70.7)	47 (51.6)
Yes	163 (19.0)	18 (7.0)	52 (15.2)	49 (29.3)	44 (48.4)
Current psychiatric medication					
No	369 (43.1)	166 (64.3)	129 (37.8)	49 (29.3)	25 (27.5)
Yes	488 (56.9)	92 (35.7)	212 (62.2)	118 (70.7)	66 (72.5)
Current Psychological/ Psychiatric treatment					
No	817 (95.3)	258 (100)	330 (96.8)	150 (89.8)	79 (86.8)
Yes	40 (4.7)	0 (0)	11 (3.2)	17 (10.2)	12 (13.2)
Past Psychological/ Psychiatric treatment					
No	470 (54.8)	178 (69.0)	208 (61.0)	62 (37.1)	22 (24.2)
Yes	387 (45.2)	80 (31.0)	133 (39.0)	105 (62.9)	69 (75.8)

Procedures

This study consists of an online cross-sectional survey. The protocol with all instruments was inserted into the Google Forms platform, and the link was then distributed via email (institutional and personal) and social media (e.g., Facebook, LinkedIn). Participants under the age of 18 were informed of the main aims of the study and the voluntary and anonymous nature of the study. All participants signed an online informed consent form. No compensation or incentives were offered for participation in the study, and no risks were identified. Data were collected between September 2020 and May 2021 (during the COVID-19 pandemic). Completion of the protocol took between 10 and 15 minutes.

The study was submitted to and approved by the Lusíada University Ethics Committee. All ethical standards and procedures established in the Declaration of Helsinki and Portuguese legislation were followed.

Measures

Generalized Anxiety Disorder - 7 (GAD-7; Spitzer et al., 2006). GAD is a seven-item self-report measure to screen, diagnose, and assess symptom severity in generalized anxiety disorder. It is a 4-point Likert scale (0 – *not at all* to 3 – *nearly every day*) assessing how often the individual has been bothered by each symptom over the past two weeks. The total score ranges from 0 to 21 and results from the sum of the seven items. GAD-7 revealed good psychometric properties for the original version ($\alpha = .92$; Spitzer et al., 2006) and the Portuguese adaptation ($\alpha = .89$; Sousa et al., 2015). The Cronbach's alpha for the current sample was .89.

Satisfaction with Life Scale (SWLS; Diener et al., 1985). SWLS is a self-report measure to assess global life satisfaction. It comprises five items on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total score results from the sum of the items and ranges between 5 to 40. The original version (Diener et al., 1985) and the Portuguese version of SWLS (Simões, 1992) revealed good psychometric properties. In the present study, the internal consistency was .80.

Persistent and Intrusive Negative Thoughts Scale (PINTS; Magson et al., 2019). PINTS is a self-report measure that assesses the three core characteristics of maladaptive repetitive negative thought: (a) repetitive; (b) intrusive; and (c) difficult to disengage from. It is a five-item scale rated on a 5-point Likert scale (1 – *never* to 5 – *almost always*). The total was computed by summing the five items, ranging from 5 to 25. PINTS revealed good internal consistency in the original version ($\alpha = .91$; Magson et al., 2019) and the Portuguese version ($\alpha = .88$; Peixoto & Cunha, 2021). For the current sample, we reached a Cronbach's alpha of .90.

Data analysis

This study used IBM SPSS version 27.0 software to conduct all statistical analyses. A descriptive analysis was performed initially to calculate means, standard deviations, ranges, and frequencies for sample sociodemographic characterization. Pearson's correlation coefficients were calculated to assess the correlations between generalized anxiety symptoms, RNT, and life satisfaction. A multivariate analysis of variance, with Bonferroni corrections, was conducted to assess differences in RNT and life satisfaction as a function of generalized anxiety symptom groups, with post-hoc comparisons using the HSD-Tukey test to examine differences within the generalized anxiety symptom groups.

For assessing the association effect of generalized anxiety symptoms on life satisfaction, mediated by RNT, a mediation analysis using Model 4 of PROCESS macro 4.1 for the software IBM SPSS (Hayes, 2018) with bootstrapping confidence intervals was performed. Statistical assumptions and correlation coefficients between all variables and sociodemographic variables were found. A mediation model is grounded on a variable (i.e., generalized anxiety symptoms) that is theorized to predict an outcome (i.e., life satisfaction) through a mediator variable (i.e., RNT), including covariables with potential confounding effects (i.e., age, sex, clinical diagnosis, and current psychiatric medication). Thus, two pathways (direct and indirect effects) are defined through which generalized anxiety symptoms may predict life satisfaction (Hayes, 2018). Indirect effects were assessed with 5000 bootstrap samples based on 95% Bias-Corrected Bootstrap Confidence Intervals (95% BCBCI; Preacher & Hayes, 2008). Mediation effect size criteria interpretation was established according to the work of Preacher and Kelley (2011) as small-0.01; medium-0.09; and large-0.25. The percentage of the total mediation effect was calculated (Shrout & Bolger, 2002).

RESULTS

Generalized anxiety symptoms, RNT, and life satisfaction

According to the cut-off score for the GAD-7 (Sousa et al., 2015; Spitzer et al., 2006), 258 (30.11%) individuals scored less than four points and were assigned to the group without generalized anxiety symptoms. About 341 (39.79%) individuals scored between five and nine and were assigned to the mild generalized anxiety symptoms group, 167 (19.49%) individuals scored between 10 and 14 and were assigned to the moderate generalized anxiety symptoms groups, whereas 91 (10.61%) individuals scored above 15 and were assigned to the severe generalized anxiety

symptoms group. Means, standard deviations, and ranges of generalized anxiety symptoms, RNT, and life satisfaction are shown in Table 2. Pearson correlation coefficients between generalized anxiety symptoms, RNT, and life satisfaction are also shown in Table 2.

Table 2

Means, standard deviations, range, and Pearson's correlation coefficients between GAD symptoms, RNT, and life satisfaction (N = 857)

Variables	M (SD)	Range	1.	2.	3.
1. GAD symptoms	7.49 (5.06)	0.00-21.00	-		
2. RNT	16.59 (4.25)	5.00-25.00	.59***	-	
3. Life satisfaction	15.86 (4.23)	5.00-25.00	-.22***	-.34***	-

*** $p < .001$

Differences in RNT and life satisfaction according to different levels of generalized anxiety symptoms

To examine differences in RNT and life satisfaction according to the degree of generalized anxiety symptomatology (i.e., absence, mild, moderate, and severe), multivariate analysis of variance with Bonferroni corrections was performed, and significant main effects were found for the degree of generalized anxiety symptomatology, Wilks' lambda = .68, $F(6,853) = 61.51$, $p < .001$, partial $\eta^2 = .18$.

Univariate tests revealed significant main effects for RNT, $F(3,856) = 135.45$, $p < .001$, partial $\eta^2 = .32$, and for life satisfaction, $F(3,856) = 12.40$, $p < .001$, partial $\eta^2 = .04$. Table 3 illustrates the means, standard errors, and 95% confidence intervals for RNT and life satisfaction as a function of the different levels of generalized anxiety symptoms.

Table 3

Means, standard errors and 95% confidence intervals for RNT and life satisfaction according to levels of GAD symptoms (N = 857)

	No GAD symptoms (n = 258)	Mild GAD symptoms (n = 341)	Moderate GAD symptoms (n = 167)	Severe GAD symptoms (n = 91)	Univariate test
	M (SE) 95% CI	M (SE) 95% CI	M (SE) 95% CI	M (SE) 95% CI	F(3, 856)
RNT	13.61 (0.22) ^a 13.18 – 14.03	16.50 (0.19) ^{a,b} 16.12 – 16.87	19.01 (0.27) ^{a,b,c} 18.48 – 19.55	20.93 (0.37) ^{a,b,c} 20.21 – 21.66	135.45***
Life satisfaction	16.76 (0.26) ^a 16.26 – 17.27	16.12 (0.23) ^b 15.68 – 16.56	14.77 (0.32) ^{a,b} 14.14 – 15.40	14.35 (0.44) ^{a,b} 13.50 – 15.21	12.40***

*** $p < .001$. Different letters in mean values indicated statistically significant differences between groups according to post hoc comparison with HSD Tukeytest.

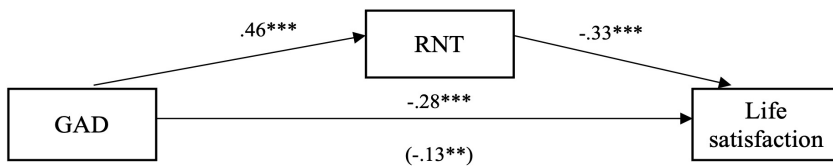
According to post-hoc comparisons using the HSD Tukey test, individuals without generalized anxiety symptoms scored significantly lower on RNT than individuals with mild generalized anxiety symptoms ($p < .001$), with moderate generalized anxiety symptoms ($p < .001$), and with severe generalized anxiety symptoms ($p < .001$). Individuals with mild generalized anxiety symptoms scored significantly lower on RNT than individuals with moderate generalized anxiety symptoms ($p < .001$) and with severe generalized anxiety symptoms ($p < .001$). Also, individuals with moderate generalized anxiety symptoms scored significantly lower on RNT than individuals with severe generalized anxiety symptoms ($p < .001$).

For life satisfaction, individuals without generalized anxiety symptoms scored significantly higher on life satisfaction compared to individuals with moderate generalized anxiety symptoms ($p < .001$) and to individuals with severe generalized anxiety symptoms ($p < .001$). Individuals with mild generalized anxiety symptoms scored significantly higher on life satisfaction than individuals with moderate generalized anxiety symptoms ($p = .003$) and individuals with severe generalized anxiety symptoms ($p = .002$). No statistically significant differences were found in life satisfaction between persons without generalized anxiety symptoms and persons with mild generalized anxiety symptoms ($p = .371$) and between persons with moderate and severe generalized anxiety symptoms ($p = 1.00$).

Mediation role of RNT in the relationship between generalized anxiety symptoms and life satisfaction

Preliminary point-biserial correlation coefficients between sociodemographic variables (i.e., age, sex, clinical diagnosis, and current psychiatric medication) and generalized anxiety symptoms, RNT, and life satisfaction were performed. Age was negatively correlated with generalized anxiety symptoms ($r_{pb} = -.20, p < .001$), RNT ($r_{pb} = -.21, p < .001$), and life satisfaction ($r_{pb} = -.10, p = .005$). Sex was positively correlated with generalized anxiety symptoms ($r_{pb} = .17, p < .001$), RNT ($r_{pb} = .16, p < .001$), and life satisfaction ($r_{pb} = .13, p < .001$). Clinical diagnosis was positively correlated with generalized anxiety symptoms ($r_{pb} = .35, p < .001$) and RNT ($r_{pb} = .28, p < .001$) and negatively correlated with life satisfaction ($r_{pb} = -.12, p < .001$). Finally, current psychiatric medication was positively correlated with generalized anxiety symptoms ($r_{pb} = .27, p < .001$), RNT ($r_{pb} = .11, p = .001$), and life satisfaction ($r_{pb} = .28, p < .001$). The mediation model explained 26.8% of the variance in life satisfaction, which was significant, $R^2 = .268, F(6,850) = 51.96, p < .001$, after controlling for age ($p = .010$), sex ($p < .001$), clinical diagnosis ($p = .649$), and current psychiatric medication ($p < .001$). The regression of generalized anxiety symptoms on life satisfaction was statistically significant, $\beta = -.28, SE =$

.03, $t = -9.57$, $p < .001$; 95% BCBCI -0.33 – -0.22. Regression of generalized anxiety symptoms on RNT (mediator) was statistically significant, $\beta = .46$, $SE = .03$, $t = 17.82$, $p < .001$; 95% BCBCI 0.41 – 0.51. The regression of RNT (mediator) on life satisfaction was statistically significant, $\beta = -.33$, $SE = .04$, $t = -8.96$, $p < .001$; 95% BCBCI -0.40 – -0.26. Finally, the regression of generalized anxiety symptoms on life satisfaction was statistically significant after controlling for RNT (mediator), $\beta = -.13$, $SE = .03$, $t = -3.87$, $p = .001$; 95% BCBCI -0.19 – -0.06 (Figure 1). The mediation effect size for RNT was .18, and 54.2% of the total effect of generalized anxiety symptoms on life satisfaction was mediated by RNT, controlling for age, sex, clinical diagnosis, and current psychiatric medication.



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

Figure 1 – Mediation model of RNT in the relationship between GAD and life satisfaction, controlling for age, sex, clinical diagnosis, and current psychiatric medication ($N = 857$)

DISCUSSION

Anxiety disorders were considered very common, negatively impacting well-being and life satisfaction (e.g., Kessler, 2000). Moreover, GAD is considered a disabling anxiety disorder that significantly affects life satisfaction, implying a transdiagnostic process of RNT (e.g., Ehring & Watkins, 2008). Considering the gap in the study of the mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction, the present study aimed to explore and examine the differences in RNT and life satisfaction depending on the severity of generalized anxiety symptoms. The main results underscored the mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction, revealing that over 54% of the overall effect of generalized anxiety symptoms on life satisfaction was mediated by RNT when controlling for age, sex, clinical diagnosis, and current psychiatric medication.

The results of the prevalence rates of generalized anxiety severity symptoms showed that almost 40% of the current sample suffered from mild generalized anxiety symptoms, almost 30% of the current sample suffered from moderate to severe generalized anxiety symptoms, while the other 30% of the current sample had no

generalized anxiety symptoms. According to studies conducted in Europe, anxiety disorders were the most common mental disorder (Pinto-Meza et al., 2013; WHO, 2022a, b), including research studies conducted in Portugal (Caldas de Almeida et al., 2013) that show that GAD was prevalent in the Portuguese community (Antunes et al., 2018; Ruscio et al., 2017). In addition, considering that the sample recruitment occurred during the COVID-19 pandemic, it is possible that prevalence rates from the current study were overestimated as a negative consequence of the pandemic crisis on mental health (see Passos et al., 2020; Paulino et al., 2021; Peixoto et al., 2022). Worry has been described as a key feature of generalized anxiety (Ehring & Watkins, 2008; Hur et al., 2017; Watkins et al., 2005; Vislă et al., 2022), and during the COVID-19 outbreak it was one of the most prevalent cognitive-emotional processes described in studies along with depression, anxiety or stress (Gamonal-Limcaoco et al., 2022; Wechsler et al., 2022). Although disturbing, prevalence rates should be interpreted in light of the timeline of sample recruitment.

As expected, negative correlations were observed between life satisfaction and RNT and between life satisfaction and generalized anxiety symptoms. Previous research has found a negative correlation between life satisfaction and RNT (Magson et al., 2019; Peixoto & Cunha, 2021) and between life satisfaction and generalized anxiety symptoms (Beutel et al., 2009; Bourland et al., 2000; Koivumaa-Honkanen et al., 1999; Massion et al., 1993; Shear & Mammen, 1997; Stein, 2001; Stein & Heimberg, 2004), suggesting that repetitive thoughts and generalized anxiety symptoms were associated with impaired life satisfaction. Perceptions of satisfaction with one's life involve matching one's standard of living to one's current life (Pavot & Diener, 1993, 2008). Generalized anxiety has been described as a permanent state of worry about various domains of life such as health, family, work, or social relationships (APA, 2013; Kessler, 2000; Massion et al., 1993), and RNT has been conceptualized as a form of negative cognitive process (Ehring et al., 2011; McEvoy et al., 2015). In this sense, it is possible to hypothesize that worry about various life domains and to engage in cycling negative thoughts were associated with the perception that life did not meet previously established standards and expectations. Statistical correlations did not allow us to assume causality, and it is only possible to conclude that worry and recurrent negative thoughts affect life satisfaction ratings, just as perceptions of poor life satisfaction promote states of worry and RNT. The bidirectional interaction between RNT, generalized anxiety, and life satisfaction underscores the need for psychological interventions that focus on reducing symptoms, enhancing well-being, and promoting strategies to improve life satisfaction. Furthermore, a positive correlation was observed between RNT and generalized anxiety symptoms, which is also consistent with previous empirical research (McEvoy & Mahoney, 2013; Spinhoven et al., 2015; Topper et al., 2010;

Whal et al., 2019) and highlights the association between repetitive and intrusive thoughts and generalized anxiety symptomatology. This result corroborated the approach that establishes that worry is a subtype of RNT as a negative cognitive content about future events (McEvoy et al., 2015).

Theoretically, generalized anxiety includes a cognitive dimension of repetitive thoughts and worries about future negative events (APA, 2013; Ehring & Watkins, 2008; Hur et al., 2017; Kessler, 2000; McEvoy et al., 2015; Topper et al., 2010; Vislá et al., 2022; Wahl et al., 2019; Watkins et al., 2005), with a focus on RNT (McEvoy & Mahoney, 2013; Spinhoven et al., 2015). When looking at the severity of generalized anxiety symptoms and RNT scores, there were significant differences between individuals without generalized anxiety symptoms and individuals with generalized anxiety symptoms, as expected. The more severe the symptoms were, the higher the RNT scores were. Our findings support previous empirical and clinical research by highlighting the association between generalized anxiety symptom severity and RNT scores in a community-based sample. Thus, considering RNT as a transdiagnostic process (Topper et al., 2010), our results suggest an association between RNT and generalized anxiety symptomatology, which may support the use of transdiagnostic interventions such as the Unified Protocol (Barlow et al., 2017) in the treatment of different severities of generalized anxiety symptomatology.

In terms of life satisfaction, individuals without generalized anxiety symptoms reported better perceptions of life satisfaction compared to individuals with generalized anxiety symptoms, which is consistent with previous research suggesting that generalized anxiety symptoms affect life satisfaction (Beutel et al., 2009; Bourland et al., 2000; Koivumaa-Honkanen et al., 1999; Massion et al., 1993; Shear & Mammen, 1997; Stein, 2001; Stein & Heimberg, 2004). Moreover, significant differences were found only between mild and moderate-to-severe symptomatology for individuals with generalized anxiety symptoms. Our results suggest that individuals with moderate or severe symptomatology, regardless of the severity of generalized anxiety symptoms, experience impairment in their assessment of life satisfaction. Given this finding, psychotherapeutic interventions for moderate and severe generalized anxiety symptom severity are paramount to improving life satisfaction and well-being. This particular finding alerts clinical psychologists, psychotherapists, and other mental health professionals to the need for clinical intervention in cases of moderate-to-severe generalized anxiety symptomatology, as moderate-severe symptoms negatively impact life satisfaction. It also emphasizes the need to pay attention to the individual's self-perceived level of impairment in functioning. Finally, concerning prevention programs, it indicates that the severity of symptoms and the self-perceived degree of life satisfaction should be considered.

The mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction revealed a significant model with a major role of RNT, with the mediation effect being approximately large and RNT explaining over 54% of the overall effect of generalized anxiety symptoms on life satisfaction when controlling for age, sex, clinical diagnosis, and current psychiatric medication. Previous efficacy studies have shown positive results for the decrease in generalized anxiety symptoms and frequency of RNT with cognitive-behavioral psychotherapy (McEvoy et al., 2015), action and commitment therapy (Ruiz et al., 2019), and metacognitive therapy (Newby et al., 2014). According to WHO (2018), well-being is a priority and goal in mental health. Taking into account that life satisfaction has been described as an indicator of individual and societal well-being (Lombardo et al., 2018), and considering its connection with mental health (Fergusson et al., 2015; Lombardo et al., 2018) as well as the central mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction in a community-based sample, psychotherapeutic and psychological clinical interventions should target the transdiagnostic process of RNT to overcome generalized anxiety symptomatology and promote life satisfaction, well-being, and quality of life. Although worry has been considered a key feature of generalized anxiety (APA, 2013; Kessler, 2000; Massion et al., 1993), our study highlights the role of a broader transdiagnostic process, RNT (Ehring & Watkins, 2008). Therefore, clinical psychologists and psychotherapists should consider clinical assessment of transdiagnostic processes and dimensions when treating individuals with generalized anxiety and use cognitive-behavioral techniques that work not only with worry but also with rumination and other types of repetitive thoughts. Future studies should consider replicating the current results with clinical samples and using longitudinal methods. It is also recommended that studies evaluating the efficacy of transdiagnostic versus non-transdiagnostic interventions for generalized anxiety be conducted to test the implications of the current findings.

The current study has limitations that should be noted. The study was conducted with a community-based sample; therefore, no medical or clinical diagnosis was considered based on a (semi)structured interview and according to DSM-5 diagnostic criteria (APA, 2013). Although GAD-7 (Spitzer et al., 2006) has clinical sensitivity and allows discriminating between individuals with and without generalized anxiety symptomatology, future studies including clinical samples are needed. This study only examined the mediating role of RNT and did not include other specific RNT dimensions, such as worry, a core cognitive dimension for GAD. Further research should be conducted to examine the mediating role of RNT and worry in the relationship between generalized anxiety symptoms and life satisfaction. In addition, life satisfaction was the only variable measured to assess well-being. Future

research should aim to examine other dimensions of well-being. Finally, the study has a cross-sectional methodology, which limits the cause-effect interpretation.

Despite the acknowledged limitations, the current results draw attention to the increase in RNT and impairment in life satisfaction depending on the severity of generalized anxiety symptoms. In addition, the study examined the mediating role of RNT in the relationship between generalized anxiety symptoms and life satisfaction, highlighting the role of RNT in this relationship. According to the current results, in a community-based sample, RNT plays a significant and important role in the relationship between generalized anxiety symptoms and life satisfaction, explaining over 54% of the effect of generalized anxiety symptoms on life satisfaction when controlling for age, sex, clinical diagnosis, and current psychiatric medication. To promote well-being and life satisfaction, psychotherapists and clinical psychologists should be aware of RNT processes in patients with generalized anxiety complaints and consider this transdiagnostic process in their interventions.

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