Cognitive Therapy and Research (2022) 46:367–392
https://doi.org/10.1007/s10608-021-10260-2

ORIGINAL ARTICLE

Empirical Evidence of the Metacognitive Model of Rumination and Depression in Clinical and Nonclinical Samples: A Systematic Review and Meta-Analysis

Julia B. Cano-López[1] · Esperanza García-Sancho[2] · Belén Fernández-Castilla[3] · José M. Salguero[1]

Accepted: 11 August 2021 / Published online: 21 September 2021

Abstract
Rumination is considered a cognitive vulnerability factor in the development and maintenance of depression. The metacognitive model of rumination and depression suggests that the development of rumination and its association with depression partly depends on metacognitive beliefs. Two metacognitive beliefs about rumination have been identified: positive beliefs about its utility and negative beliefs about the uncontrollability and its negative social consequences. We conducted a systematic review and meta-analysis aimed: (1) to analyze the associations between metacognitive beliefs and rumination and depression; (2) to test the metacognitive model, using a Two-Stage Structural Equation Modeling approach (TSSEM). Literature search retrieved 41 studies. These 41 studies ($N = 10{,}607$) were included in the narrative synthesis and meta-analysis, and 16 studies ($N = 4477$) were comprised for the TSSEM. Results indicated metacognitive beliefs are associated with rumination and depression. Measures on metacognitive beliefs about rumination indicated that positive beliefs showed moderate associations with rumination ($r = 0.50$), and low with depression ($r = 0.27$); whereas negative beliefs showed moderate associations with both rumination ($r = 0.46$) and depression ($r = 0.49$). These results were consistent across studies using different instruments to measure metacognitive beliefs, and in both clinical and nonclinical samples. Moreover, results of the TSSEM analyses showed that the metacognitive model had a good fit. In sum, our results are in line with the metacognitive model of rumination and depression, highlighting that metacognitive beliefs are relevant factors to understand why people ruminate and get depressed. Future directions and clinical implications are discussed.

Keywords Metacognitive beliefs · Rumination · Depression · Meta-analysis

Introduction

Depression is one of the leading causes of disability worldwide (Kessler & Bromet, 2013) and one of the most debilitating mental disorders (Mrazek et al., 2014). It is a highly prevalent and often chronic condition with high costs, as shown in the relapse and recurrence rates, in addition to the substantial proportion of treatment-resistant patients (Beshai et al., 2011; Thomas et al., 2013). Therefore, research that examines the risk factors and underlying mechanism of depression is needed to achieve significant theoretical and clinical advances.

Rumination is a key cognitive feature of depression (Nolen-Hoeksema et al., 2008; Papageorgiou & Wells, 2004, 2009). According to Nolen-Hoeksema et al. (2008), it is defined as repetitive negative thinking that focuses an individual's attention on his or her depressive symptoms and on the causes, implications, and meanings of these symptoms. Rumination is considered to be a maladaptive emotion regulation strategy used in response to negative affect (Joormann & Quinn, 2014). Moreover, it is a strategy that exacerbates and prolongs depression, for example, enhancing the depressed mood, negatively biasing thinking, or interfering with effective problem solving (Lyubomirsky & Tkach, 2004). Likewise, many studies have highlighted rumination as a cognitive vulnerability factor in the development and maintenance of depression (for a review, see

✉ Esperanza García-Sancho
esperanza.garcia@uco.es

[1] University of Malaga, Malaga, Spain

[2] Department of Psychology, Faculty of Education Science, University of Cordoba, Calle San Alberto Magno, s/n, 14071 Córdoba, Spain

[3] KU Leuven, Leuven, Belgium

Nolen-Hoeksema et al., 2008; Watkins & Roberts, 2020). After exposing the role of rumination in depression and its negative consequences, a relevant aim of research has been to examine what factors lead people to use this strategy.

An answer to this can be found in the metacognitive model of rumination and depression (Papageorgiou & Wells, 2003, 2004; Wells, 2009). The metacognitive model, which is based on a broader model of emotional disorders called the self-regulatory executive function (S-REF; Wells, 2019; Wells & Matthews, 1994, 1996), suggests that the activation and maintenance of rumination, and its association with depression, are dependent on metacognitive beliefs. Metacognitive beliefs refer to stable beliefs people have about their own cognitive system, which influence the control, monitoring, and appraisal of cognition. There are two principal metacognitive beliefs: positive beliefs, referring to the utility of rumination (e.g., "I need to ruminate to find answers to my problems"), and negative beliefs, referring to the uncontrollability and danger of rumination (e.g., "rumination about my problems is uncontrollable") and its negative interpersonal and social consequences (e.g., "people will reject me if I ruminate"). According to the model (see Fig. 1), positive metacognitive beliefs about the utility of rumination are activated in response to a trigger (negative mood or thoughts), leading people to use rumination. Rumination is supposed to overcome the negative situation and help understand the problem or solve it; however, as reviewed above, rumination is usually not useful and, instead, leads to even more negative thoughts and increases the negative effect. As a result, negative metacognitive beliefs related to the uncontrollability and harmfulness of rumination and its negative interpersonal and social consequences emerge. These negative beliefs lead people to appraise their own rumination as uncontrollable and dangerous (e.g., socially), increasing the accessibility of negative information (e.g., negative emotions or thoughts), and thus enhancing depressive symptomatology. From this approach, metacognitive beliefs are causal factors in predicting rumination and depression (Wells, 2009, 2019).

To test the metacognitive model, two different scales have been developed to assess positive and negative metacognitive beliefs: the Positive Beliefs About Rumination Scale (PBRS; Papageorgiou & Wells, 2001b) and the Negative Beliefs About Rumination Scale (NBRS; Papageorgiou & Wells, 2001a). Whereas the PBRS has a one-factor structure, the NBRS comprises two different subscales: negative beliefs about the uncontrollability and harmfulness of rumination and negative beliefs about the social and interpersonal consequences of rumination. Likewise, a few studies have used the PBRS-A (Watkins & Moulds, 2005), a modified version in which the wording of items was rephrased to avoid references to depression and rumination, thereby reducing the criterion contamination. The PBRS, the NBRS, and the adapted version (PBRS-A) have shown good psychometric properties and are valid measures to assess metacognitive beliefs about rumination (Luminet, 2004; Watkins & Moulds, 2005).

In addition to these scales specifically focused on rumination, the gold-standard instrument to assess metacognitive beliefs is the Meta-Cognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004). This questionnaire was designed to assess individual differences in dysfunctional metacognitive beliefs. It is composed of five subscales: (1) positive beliefs about worry (e.g., "Worrying helps me cope"); (2) negative beliefs of uncontrollability and danger (e.g., "I cannot ignore my worrying thoughts"); (3) cognitive confidence (e.g., "I have a poor memory"); (4) need to control thoughts (e.g., "I will be punished for not controlling certain thoughts"); and (5) cognitive self-consciousness (e.g., "I monitor my thoughts"). Although two of the MCQ subscales are specifically focused on worry, this instrument has been widely used to obtain evidence related to

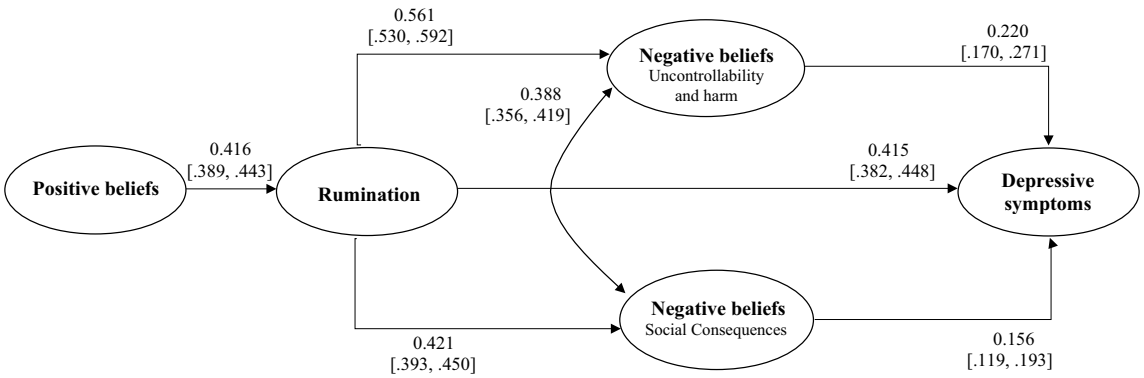

Fig. 1 Standardized regression coefficients and likelihood based-confidence intervals obtained after carrying out a TSSEM analysis on the metacognitive model of rumination and depression (Papageorgiou & Wells, 2003, 2004; Wells, 2009)

the metacognitive model of rumination and depression, and there is a growing body of research that has used the MCQ and shown that metacognitive beliefs are a transdiagnostic factor in psychopathology (for a review, see Sun et al., 2017; Wells, 2019).

The metacognitive model of rumination and depression is applicable both theoretically and clinically. It is theoretically relevant because it suggests that metacognitive beliefs have a causal role in explaining why people ruminate and get depressed, so its study could lead to a more complete understanding of vulnerability to depression. It is clinically relevant because metacognitive beliefs can be formulated as a major target in therapy, and therapeutic interventions can be developed to modify these beliefs. Thus, this model has led to a metacognitive-focused therapy for depression (Papageorgiou & Wells, 2004; Wells, 2009). This therapy works to bring rumination under executive control, modifying maladaptive metacognitive beliefs and allowing higher flexibility in processing negative thoughts and affect; it has shown promising preliminary results for depression (Hagen et al., 2017a; Hjemdal et al., 2017), even in recurrent and persistent cases (Wells et al., 2009; Winter et al., 2019). These implications warrant the need to review and delve into this model.

Our Study

We present a systematic review and meta-analysis of the empirical research focused on the study of the metacognitive model of rumination and depression (Papageorgiou & Wells, 2003, 2004; Wells, 2009). We had two specific goals: (a) to review studies that examined the link between metacognitive beliefs and rumination and depression, pooling the correlations between metacognitive scales (PBRS/NBRS and MCQ) and depression/rumination, and examining the effect of three moderator variables: type of instrument (PBRS/NBRS vs. MCQ), type of sample (clinical vs. nonclinical), and proportion of women in the sample; (b) to review studies that tested the model by jointly examining the associations between metacognitive beliefs, rumination, and depression, and testing the metacognitive model through the two-stage structural equation modeling approach (TSSEM; Cheung & Chan, 2005).

Our intention was to develop a clear picture of the current state of research about the model and draw conclusions that may help future research in the field and potentially guide the implementation of practical interventions.

Method

Literature Search

PsycINFO, PubMed, and Scopus databases were searched exhaustively over the period November 10–13, 2019, for articles published in Spanish and English in scientific journals. We searched for studies examining the link between metacognitive beliefs, rumination, and depression. For this purpose, relevant articles were tagged when they contained "metacognition" or "metacognitive beliefs" as keywords or as a term in the title or abstract, together with one or more additional search terms. In PsycINFO and Scopus, these additional terms were "rumination," "brooding," "depression," and "major depression"; in PubMed, they were the medical subject headings (MeSH) terms "rumination, cognitive," "depression," and "major depression."

Inclusion and Exclusion Criteria

We selected studies if they met the following inclusion criteria: (a) they were empirical studies that examined the relationship between metacognitive beliefs, rumination, and/or depression; (b) they used nonclinical samples or depressed samples (studies in which the primary disorder was depression); and (c) they measured metacognitive beliefs. We included studies that used instruments to specifically measure metacognitive beliefs about rumination but also considered those studies that measured metacognitive beliefs using the MCQ-30.

We rejected studies if they met the following exclusion criteria: (a) they were theoretical studies, reviews, or meta-analyses; (b) they were written in a language other than English or Spanish; and (c) they used clinical samples in which the primary disorder was not depression.

Data Extraction

Database searches identified 1,125 relevant studies: 248 in PsycINFO, 318 in PubMed, and 559 in Scopus (Fig. 2). Elimination of duplicates gave 499 potentially eligible studies. Two independent reviewers (JBCL and EGS) screened the titles and abstracts according to the inclusion and exclusion criteria. A third reviewer (JMS) participated in cases of disagreement. This review excluded 398 studies, thus leaving 101. The full text of these studies was read, and 60 were deleted principally because (a) the primary disorder in clinical samples was not depression, and/or (b) they did not include a measure of metacognitive beliefs. A final set of 41 studies met all inclusion criteria and empirically analyzed the relationship between metacognitive beliefs and rumination and/or depression.

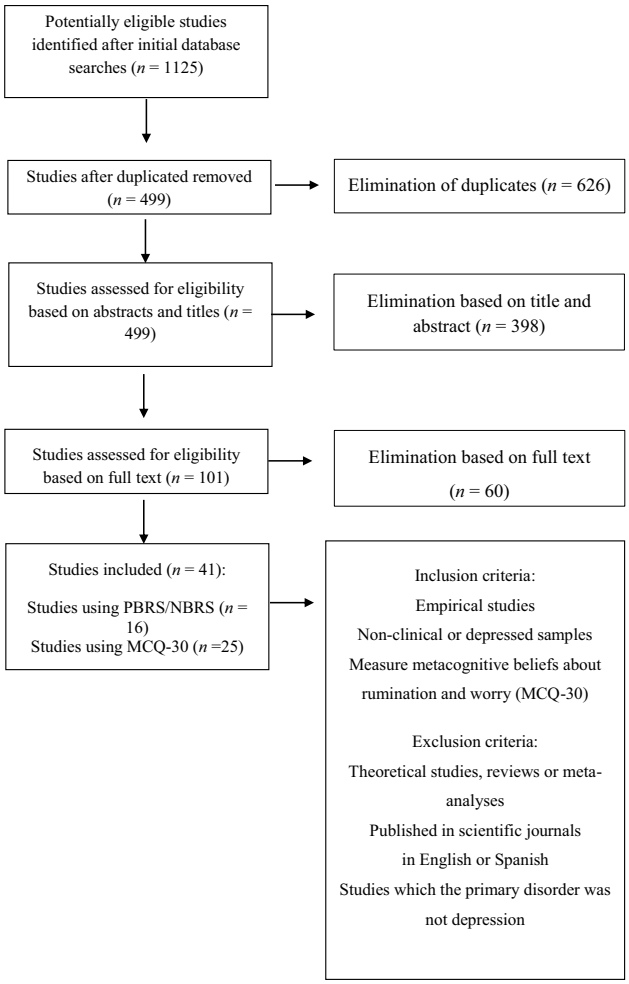

Fig. 2 Flowchart of study selection

Of the 41 studies, 16 used the PBRS and/or the NBRS, and the remaining 25 used the MCQ. It is important to note that some studies used the PBRS-A (Watkins & Moulds, 2005). On the other hand, the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) and the Beck Depression Inventory (BDI; Beck et al., 1961) were more frequently used to measure rumination and depression, respectively.

Results

Narrative Synthesis of Findings

To present the results systematically, we consider separately the studies performed with the PBRS/NBRS and the MCQ-30. Within each set of instrument-specific studies, we consider separately studies based on nonclinical and clinical samples. Thus, key information about the studies included in this review is presented as follows: Table 1 contains studies performed with the PBRS/NBRS using nonclinical samples, Table 2 describes studies performed with the PBRS/NBRS using clinical samples, Table 3 indicates studies performed with the MCQ-30 using nonclinical samples, and Table 4 specifies studies performed with the MCQ-30 using clinical samples. These tables describe the variables analyzed, the size and characteristics of the sample, the type of design used, the instruments used, and the principal findings of each study.

Results with the PBRS/NBRS

From the 16 studies that used the PBRS/NBRS, 12 used a nonclinical sample (eight cross-sectional and four longitudinal) and four used a clinical sample (three cross-sectional and one longitudinal). Most studies (12) examined the associations between the PBRS and/or NBRS with both depression and rumination, three did it only with rumination, and the remaining study only with depression. Furthermore, from the total, six tested the metacognitive model of depression and rumination through path analysis.

Nonclinical Sample

The 12 studies that used nonclinical samples were mainly composed of undergraduate students, regardless of the design. In general, the results of these studies showed positive and significant correlations between metacognitive beliefs and key variables.

In cross-sectional studies, the strongest associations with rumination were for the PBRS and the NBRS uncontrollability and harm subscale. On the other hand, the strongest correlations with depression were for the NBRS social consequences subscale. Four studies tested the metacognitive model of rumination and depression using path analysis; the results were in line with the tenets of the model: Positive beliefs lead to rumination, and rumination leads to depressive symptoms both directly and indirectly through negative metacognitive beliefs. However, there were contradictory results regarding what subscale of the NBRS was associated with depression. In this sense, Papageorgiou and Wells (2003) found that only metacognitive beliefs about social consequences lead to depressive symptoms, while Roelofs et al. (2007) found that the uncontrollability and harm subscale also did so. Solem et al. (2016), using the largest sample—1433 individuals from the general population—also found stronger correlations for the NBRS uncontrollability and harm subscale than for the social consequences subscale (Table 1).

The results from the four longitudinal studies partially corroborated those found in cross-sectional studies, with time intervals ranging from one to six months. Weber and Exner (2013) found that the time 1 PBRS explained

Table 1 Studies performed with PBRS/NBRS using non-clinical samples

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Papageorgiou and Wells (2001b)	Cross-sectional	PBRS BDI STAI-D RS-SF	$N=119$ Undergraduate psychology students 64.7% female 35.3% male $M=20.9$, $SD=2.9$ years, range 19–36	<table><tr><td></td><td>PBRS</td></tr><tr><td>BDI</td><td>0.45</td></tr><tr><td>STAI-D</td><td>0.43</td></tr><tr><td>RS</td><td>0.53</td></tr></table>All $p<0.001$	All correlations were positive and significant. Relations between PBRS and both state and trait depression were mediated by actual rumination
Papageorgiou and Wells (2003)	Cross-sectional	PBRS NBRS IDD RRS	$N=200$ Undergraduate and graduate psychology students 79.5% female 20.5% male $M=21.4$, $SD=4.5$ years, range 18–52	<table><tr><td></td><td>PBRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr><tr><td>IDD</td><td>0.23</td><td>0.35</td><td>0.47</td></tr><tr><td>RRS</td><td>0.58</td><td>0.51</td><td>0.39</td></tr></table>All $p<0.02$ Path analysis testing metacognitive model $\chi^2(7, N=200)=10.5, p>0.05$ CFI = 0.99	All correlations were positive and significant The path analysis of the metacognitive model showed that only the NBRS social consequences subscale leads to depressive symptoms
Roelofs et al. (2007)	Cross-sectional	PBRS NBRS QIDS RRS	$N=196$ Undergraduate students 81.6% female 18.4% male $M=21.4$, $SD=2.5$ years, range 18–28	<table><tr><td></td><td>PBRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr><tr><td>QIDS</td><td>0.31</td><td>0.26</td><td>0.14^{ns}</td></tr><tr><td>RRS</td><td>0.55</td><td>0.30</td><td>0.17^{ns}</td></tr></table>All $p<0.001$ Path analysis testing the metacognitive model $\chi^2(3, N=196)=13.7, p>0.05$ RMSEA = 0.073 CFI = 0.99	NBRS social consequences showed no significant associations with depression and rumination The path analysis testing the metacognitive model showed that only the NBRS uncontrollability and harm subscale leads to depressive symptoms
Ophir and Mor (2014)	Cross-sectional	PBRS-A BDI-II RRS	$N=118$ Students 68.6% female 31.4% male $M=24$, $SD=3.2$ years, range 18–44	<table><tr><td></td><td>PBRS-A</td></tr><tr><td>BDI-II</td><td>0.06^{ns}</td></tr><tr><td>RRS</td><td>0.32</td></tr><tr><td>RRS Brooding</td><td>0.31</td></tr><tr><td>RRS Reflection</td><td>0.35</td></tr></table>All $p<0.01$	The adapted version (PBRS-A) was positively and significantly correlated with rumination but not with depression

Table 1 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Yilmaz et al. (2015)	Cross-sectional	PBRS NBRS BDI	$N=251$ Undergraduate and post-graduate students 65.3% female 33.9% male 0.8% missing values $M=22.5$, $SD=5.0$ years, range 17–59	<table><tr><td></td><td>PBRS</td><td>NBRS</td></tr><tr><td>BDI</td><td>0.32</td><td>0.55</td></tr></table> All $p<0.01$	Correlations among BDI, PBRS, and NBRS were positive and statistically significant PBRS and NBRS individually explained a significant amount of variance in depressive symptomatology while controlling for anxiety. Reversing steps, so that NBRS and PBRS were entered on step 2, the metacognitive beliefs significantly increased the variance explained Other variables were also entered in the regression analyses: anxiety and depressive schemata
Solem et al. (2016)	Cross-sectional	PBRS NBRS BDI RRS	$N=1433$ General population 73.1% female 26.9% male $M=24.6$, $SD=4.3$ years	<table><tr><td></td><td>PBRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr><tr><td>BDI</td><td>0.27</td><td>0.60</td><td>0.51</td></tr><tr><td>RRS</td><td>0.39</td><td>0.63</td><td>0.44</td></tr></table> p not shown Path analysis testing the metacognitive model $\chi^2(2)=2.8$, $p=0.246$ RMSEA = 0.017 CFI = 1.00	NBRS uncontrollability subscale showed strongest correlations In the path analysis testing the metacognitive model, this study does not differ between NBRS uncontrollability and NBRS social consequences subscales because using a two-factor solution of the NBRS produced a poorer fit
Yilmaz (2016)	Cross-sectional	PBRS NBRS BDI RRS-SF	$N=305$ Undergraduate students 54.8% female 45.2% male $M=22.4$, $SD=2.6$ years, range 18–29	<table><tr><td></td><td>PBRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr><tr><td>BDI</td><td>0.27</td><td>0.55</td><td>0.52</td></tr><tr><td>RRS -SF</td><td>0.41</td><td>0.54</td><td>0.47</td></tr></table> All $p<0.001$ Path analysis testing the metacognitive model χ^2 (7, $N=305$) = 12.75, $p=0.08$, $\chi 2/sd=1.82$ RMSEA = 0.05 CFI = 0.99	NBRS displayed the strongest correlation with depressive symptoms Path analysis testing the metacognitive model showed that both subscales, uncontrollability and social consequences, lead to depressive symptoms

Table 1 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Huntley and Fisher (2016)	Cross-sectional	PBRS NBRS IDS-SR RRS	*N* = 715 Students 64.3% female 35.7% male *M* = 21.3, *SD* = 4.1 years, range 17–51	<table><tr><td></td><td>PBRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr><tr><td>IDS-SR</td><td>0.24</td><td>0.61</td><td>0.49</td></tr><tr><td>RRS</td><td>0.39</td><td>0.61</td><td>0.45</td></tr></table>All $p < 0.001$	All correlations were positive and statistically significant In the regression analyses, rumination and NBRS uncontrollability were significant predictors of depressive symptoms Other variables were entered in the regression analyses: age, gender, and dysfunctional attitudes
Papageorgiou and Wells (2009)	Longitudinal 12-week interval	NBRS IDD (T1 and T2) RSS	*N* = 164 Students 81.1% female 18.9% male *M* = 21.1, *SD* = 4.2 years, range 19–52	<table><tr><td></td><td>RRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr></table><table><tr><td></td><td>RRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr></table><table><tr><td></td><td>IDD T1</td><td>RRS</td><td>NBRS (Uncontrol & harm)</td><td>NBRS (Social)</td></tr><tr><td>β</td><td>−0.10</td><td>−0.03</td><td>−0.13</td><td>−0.06</td></tr><tr><td>*p*</td><td>.001</td><td>0.099[ns]</td><td>0.049</td><td>0.597[ns]</td></tr></table>	For IDD at times 1 and 2, all correlations were positive and significant, especially for RRS IDD at time 1 and NBRS uncontrollability subscale were significant predictors of IDD at time 2, both negatively associated, although correlation analyses were positive NBRS uncontrollability and harm subscales prospectively predict depression even after controlling for initial levels of depression and rumination. Therefore, any effect that rumination might have on depression may be the result of variance shared with NBRS
Weber and Exner (2013)	Longitudinal 8-week interval	PBRS BDI-II (T1 and T2) RRS (T1 and T2)	*N* = 60 Undergraduate and graduate students 75% female 25% male *M* = 22.2, *SD* = 3.6 years, range 18–34	<table><tr><td></td><td>PBRS</td></tr></table><table><tr><td></td><td>β</td><td>*p*</td></tr><tr><td>Step 1: control variable T1 rumination</td><td>0.77</td><td><0.001</td></tr><tr><td>Step 2: main effect T1 PBRS</td><td>0.29</td><td>0.002</td></tr></table>n T1	The correlations were positive and significant T1 PBRS explained additional variance after controlling T1 rumination with T2 rumination as a dependent variable. No other variables were introduced in the regression analyses A mediated model also showed that T2 rumination mediates the relationship between T1 PBRS and T2 depressive symptoms

Table 1 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Kubiak et al. (2014)	Longitudinal EMA, four signal-contingent momentary self-reports per day for 4 weeks	PBRS (pre-monitoring session) EMA: emotions, rumination and positive affect	$N=93$ Undergraduate students 64.5% female 35.5% male $M=23.4$, $SD=2.9$ years	Multilevel mediation model PBRS: BDI-II 0.15*; LARSS C 0.54**; LARSS_Ud 0.49**; LARSS_Un 0.29** NBRS: BDI-II 0.66***; LARSS C 0.40***; LARSS_Ud 0.28***; LARSS_Un 0.72***	PBRS was associated with ruminative thinking in daily life. Metacognitions were significantly associated with momentary affect, being almost completely mediated by momentary ruminative thinking
Matsumoto and Mochizuki (2018)	Longitudinal 6-month interval	PBRS NBRS BDI-II LARSS	Undergraduate students Time 1 $N=242$ 64.5% female 35.5% male $M=20.15$, $SD=3.44$ years Time 2 $N=117$ 60.7% female 39.3% male $M=20.43$, $SD=0.82$ years	PBRS: BDI-II 0.05; LARSS C 0.59**; LARSS_Ud 0.51**; LARSS_Un 0.32** NBRS: BDI-II 0.73***; LARSS C 0.37***; LARSS_Ud 0.36***; LARSS_Un 0.66*** ***$p<0.001$, *$p<0.05$	All correlations were positive and significant, except the association between PBRS and BDI-II at time 2 Cross-lagged effect modeling: PBRS predicted high casual analytic rumination NBRS predicted high depressive symptoms, and depressive symptoms predicted high negative meta-beliefs NBRS predicted high uncontrollability of rumination, whereas uncontrollability of rumination did not predict depressive symptoms

PBRS Positive Beliefs about Rumination Scale (Papageorgiou & Wells, 2001b), *NBRS* Negative Beliefs about Rumination Scale (Papageorgiou & Wells, 2001a), *BDI* Beck Depression Inventory (Beck & Steer, 1987), *STAI-D* State-Trait Anxiety Inventory-Depression (Bieling et al., 1998), *RS-SF* Rumination Scale, Short Form (Nolen-Hoeksema & Morrow, 1991), *IDD* Inventory to Diagnose Depression (Zimmerman et al., 1986), *RRS* Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991), *QIDS* Quick Inventory of Depressive Symptomatology (Rush et al., 2003), *PBRS-A* Positive Beliefs about Rumination Scale-Adapted (Watkins & Moulds, 2005), *BDI-II* Beck Depression Inventory-II (Beck et al., 1996), *RRS-SF* Ruminative Responses Scale, Short Form (Treynor et al., 2003), *IDS-SR* Inventory of Depressive Symptomatology, Self-Report (Rush et al., 1996), *LARSS* Leuven Adaptation of Rumination on Sadness Scale, *LARSS C* LARSS Causal analysis, *LARSS_ Ud* LARSS Understanding, *LARSS_Un* LARSS Uncontrollability (Raes et al. (2008)

Table 2 Studies performed with PBRS/NBRS using clinical samples

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Papageorgiou and Wells (2003)	Cross-sectional	PBRS NBRS IDD RRS	$N=200$ Diagnosis of major depression disorder (MDD) 74.5% female 25.5% male $M=43.3$, $SD=13.6$ years, range 23–78	Correlations PBRS: IDD 0.28, RRS 0.31 NBRS (Uncontrol & harm): IDD 0.54, RRS 0.55 NBRS (Social): IDD 0.39, RRS 0.41 All $p<0.02$ Path analysis testing the metacognitive model χ^2 (6, $N=200$) = 10.8, $p>0.05$ CFI = 0.98	All correlations were positive and significant, especially NBRS uncontrollability The path analysis testing the metacognitive model showed that both NBRS subscales lead to depressive symptoms
Watkins and Moulds (2005)	Cross-sectional	PBRS PBRS-A BDI RRS	Currently depressed group $N=32$ 56.25% female 43.75% male $M=41.8$, $SD=11.4$ years Recovered depressed group $N=33$ 57.6% female 42.4% male $M=31.0$, $SD=12.6$ years Never depressed group $N=32$ 56.25% female 43.75% male $M=39.8$, $SD=15.0$ years	PBRS / PBRS-A RRS: 0.59** / 0.44*** BDI: 0.39* / 0.19 PBRS / PBRS-A RRS: 0.49*** / 0.41*** ***$p<0.001$, *$p<0.05$	Across the entire sample ($N=97$), the total RRS score was significantly correlated with PBRS, PBRS-A, and BDI. Even when BDI scores were partialled out, PBRS and PBRS-A were still significantly correlated with ruminative response style
Roelofs et al. (2010)	Cross-sectional	PBRS NBRS IDS RRS MCQ-30	$N=179$ Clinically depressed patients 57% female 41.9% male 1.1% missing values	PBRS / NBRS (Uncontrol & harm) / NBRS (Social) IDS: 0.23* / 0.39* / 0.39* RRS: 0.25* / 0.31* / 0.32* MCQ-PB: 0.28* / 0.29* / 0.31* MCQ-NB: 0.24* / 0.61* / 0.39* MCQ-CC: 0.09ns / 0.25* / 0.24* MCQ-CT: 0.34* / 0.48* / 0.55* *Significant at α = 1% Path analysis testing the metacognitive model χ^2 (df = 6) = 8, $p=0.21$ RMSEA = 0.046 CFI = 0.99	Except for the PBRS and MCQ3 cognitive confidence, all correlations were positive and significant The path analysis testing the metacognitive model showed that NBRS uncontrollability was not associated with depressive symptoms

Table 2 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Kraft et al. (2019)	Longitudinal T0: baseline T1: 2 weeks T2: 1 month T3: 6 months T4: 12 months	PBRS NBRS BDI RRS	$N = 105$ Recurrent major depressive disorder 72% female 28% male $M = 36$, $SD = 13$ years, range 18–65	Time 0 RRS Brooding: PBRS 0.39, NBRS 0.38 Time 4 RRS Brood: PBRS 0.50, NBRS 0.70 All $p < 0.01$	In a latent growth model, PBRS, NBRS, and rumination predicted depression levels but not symptom trajectories. Testing for feedback effects, the authors found that depression levels and symptom trajectories predicted PBRS, NBRS, and rumination, although some effects were at the statistical trend level Correlations between metacognitions and inhibition/switching were also examined, but they were not significant

PBRS Positive Beliefs about Rumination Scale (Papageorgiou & Wells, 2001b), *NBRS* Negative Beliefs about Rumination Scale (Papageorgiou & Wells, 2001a), *IDD* Inventory to Diagnose Depression (Zimmerman et al., 1986), *RRS* Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991), *PBRS-A* Positive Beliefs about Rumination Scale-Adapted (Watkins & Moulds, 2005), *BDI* Beck Depression Inventory (Beck & Steer, 1987), *IDS* Inventory of Depressive Symptomatology (Trivedi et al., 2004), *MCQ-30* Meta-Cognitions Questionnaire-30, *MCQ-PB* Positive beliefs about worry, *MCQ-NB* Negative beliefs about worry, *MCQ-CC* Cognitive confidence, *MCQ-CT* Need to control thoughts (Wells & Cartwright-Hatton, 2004)

significantly more variance in time 2 rumination after controlling time 1 rumination. Kubiak et al. (2014) carried out an ecological momentary assessment (EMA) and examined the effect of the PBRS on rumination and positive affect. They found that the PBRS predicted rumination and that the effect of the PBRS on momentary positive affect was significantly mediated by rumination, while the direct effect was not significant. Papageorgiou and Wells (2009) showed that the NBRS uncontrollability and harm subscale was the only significant predictor of depression at time 2 (after controlling for depressive symptoms at baseline). Notably in this study, the NBRS was a negative predictor, although the NBRS (time 1) and depression (time 2) were positively associated in bivariate correlations. More recently, Matsumoto and Mochizuki (2018) conducted a cross-lagged effect modeling and found that, except for the association between PBRS and depression at time 2, all the correlations of PBRS and NBRS were positive and significant with depression and rumination and that negative metacognitive beliefs predicted prominent levels of depression (at time 2).

Clinical Sample

The samples of the four studies were heterogeneous. In one study, participants were patients from a charitable organization, and in another one they were people seeking treatment in a mood disorder program. The only longitudinal study specified recurrent major depression disorder (MDD) as an inclusion criterion. All studies examined associations between metacognitive beliefs, depression, and rumination.

In cross-sectional studies, the PBRS showed stronger associations with rumination, while the NBRS subscales presented stronger associations with depression, especially the uncontrollability and harm subscale. Watkins and Moulds (2005) used both the PBRS and the PBRS-A and showed that both questionnaires had positive and significant correlations with depression and rumination, although the PBRS showed the strongest correlations. On the other hand, the remaining two studies tested the metacognitive model through path analysis (Papageorgiou & Wells, 2003; Roelofs et al., 2010), showing results in line with the tenets of the metacognitive model. Nevertheless, as in the nonclinical sample, they found contradictory results regarding which subscale of the NBRS led to depressive symptoms: Papageorgiou and Wells (2003) found that both subscales did so, while Roelofs et al. (2010) found that only the NBRS social consequences subscale led to depressive symptoms.

Only one study (Kraft et al., 2019) used a longitudinal design with a five-time interval over 12 months. The latent growth model showed that the PBRS, the NBRS, and rumination predicted depression levels. They found that positive metacognitions predicted depression levels, but rumination accounted for the effect. Rumination and negative

Table 3 Studies performed with MCQ-30 using non-clinical samples

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Spada and Wells (2005)	Cross-sectional	HADS-D MCQ-30	$N=97$ Undergraduates and professionals 54.6% female 45.4% male $M=29.8$, $SD=9.6$ years, range 18–66	Correlations HADS-D: $r=0.24^{*}$; MCQ-NB: 0.43^{**}; MCQ-CC: 0.25^{*}; MCQ-CT: 0.35^{**}; MCQ-SC: 0.24^{*} $^{*}p<0.05$, $^{**}p<0.01$	There were positive and significant associations between depression and metacognitive beliefs, especially negative beliefs and need to control thoughts subscales
Cangas et al. (2006)	Cross-sectional	BDI MCQ-65	$N=81$ Undergraduate students 70.4% female 29.6% male Age range 19–27	BDI: $r=0.13^{ns}$; MCQ-NB: 0.42^{**}; MCQ-CC: 0.50^{**}; MCQ-CT: 0.34^{**}; MCQ-SC: 0.28^{*} $^{*}p<0.05$, $^{**}p<0.01$	Except for positive beliefs, all correlations were significant and positive, especially for cognitive confidence and negative beliefs
Spada et al. (2006)	Cross-sectional	HADS-D MCQ-30	$N=179$ Undergraduate students 61.5% female 38.5% male $M=24.5$; $SD=4.7$ years, range 18–42	HADS-D: $r=0.24^{**}$; MCQ-NB: 0.36^{**}; MCQ-CC: 0.21^{**}; MCQ-CT: 0.28^{**}; MCQ-SC: 0.01^{ns} $^{**}p<0.01$	Except for self-consciousness, all correlations were significant and positive, especially for negative beliefs subscale
Barahmand (2008)	Cross-sectional	GHQ-D MCQ-65	$N=378$ Undergraduate students 60.8% female 39.2% male $M=21.58$, $SD=1.74$ years	GHQ-D: $r=0.25^{**}$; MCQ-NB: 0.48^{**}; MCQ-CC: 0.35^{**}; MCQ-CT: 0.31^{**}; MCQ-SC: 0.04 $^{**}p<0.01$	Except for cognitive self-consciousness, all correlations were significant and positive, especially for negative beliefs
Spada et al. (2008a)	Cross-sectional	HADS-D MCQ-30	$N=97$ Undergraduate students 42.3% female 57.7% male $M=23.3$, $SD=3$ years, range 18–30	HADS-D: $r=0.43^{**}$; MCQ-NB: 0.43^{**}; MCQ-CC: 0.39^{**}; MCQ-CT: 0.35^{**}; MCQ-SC: 0.45^{**} $^{**}p<0.01$	All correlations were positive and significant, especially self-consciousness¸ followed by positive beliefs and negative beliefs subscales
Spada et al. (2008b)	Cross-sectional	HADS-D MCQ-30	$N=420$ Students and non-students 65.9% female 34.1% male $M=27.4$, $SD=9.6$ years, range 18–59	HADS-D: $r=.22^{**}$; MCQ-NB: $.41^{**}$; MCQ-CC: $.25^{**}$; MCQ-CT: $.28^{*}$; MCQ-SC: $.17^{**}$ $^{**}p<0.01$	All correlations were positive and significant, especially for negative beliefs

Table 3 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Yılmaz et al. (2008)	Cross-sectional	BDI MCQ-30	$N = 561$ Undergraduates and postgraduates 53.5% female 46.5% male $M = 23.55$, $SD = 5.7$ years, range 17–52	<table><tr><td></td><td>MCQ-PB</td><td>MCQ-NB</td><td>MCQ-CC</td><td>MCQ-CT</td><td>MCQ-SC</td></tr><tr><td>BDI</td><td>$r = 0.16^{**}$</td><td>0.47^{**}</td><td>0.23^{**}</td><td>0.25^{**}</td><td>0.05^{ns}</td></tr></table>$^{**}p < 0.01$	Except for cognitive self-consciousness, all correlations were positive and significant, especially for negative beliefs
Tan et al. (2010)	Cross-sectional	DASS-21-D MCQ-30	$N = 119$ Students and non-students 79.83% female $M = 23.02$, $SD = 7.5$ years, range 18–51 20.17% male $M = 22.54$, $SD = 6.63$ years, range 18–47	<table><tr><td></td><td>MCQ-NB</td></tr><tr><td>DASS-21-D</td><td>0.58^{**}</td></tr></table>$^{**}p < 0.01$	Although only the negative beliefs correlation was shown, it was positive and significant
Karatepe et al. (2013)	Cross-sectional	BDI MCQ-30 RTS	$N = 262$ Volunteers 61.83% female 38.1% male	<table><tr><td></td><td>MCQ-NB</td><td>MCQ-CT</td></tr><tr><td>BDI</td><td>0.34^{**}</td><td>0.36^{**}</td></tr><tr><td>RTS</td><td>0.48^{**}</td><td>0.48^{**}</td></tr></table>$^{**}p < 0.01$	All correlations were positive and significant, especially for RTS. For BDI, associations were stronger with the need to control thoughts subscale
Gawęda & Kokoszka (2014)	Cross-sectional	BDI MCQ-65	$N = 161$ Undergraduate students 72.67% female 27.33% male $M = 24.49$, $SD = 7.09$ years, range 18–56	<table><tr><td></td><td>MCQ-PB</td><td>MCQ-NB</td><td>MCQ-CC</td><td>MCQ-CT</td><td>MCQ-SC</td></tr><tr><td>BDI</td><td>$r = 0.06^{ns}$</td><td>0.53^{***}</td><td>0.35^{***}</td><td>0.34^{***}</td><td>0.08^{ns}</td></tr></table>$^{***}p < 0.001$	Except for positive beliefs and cognitive self-consciousness, all correlations were positive and significant, especially for negative beliefs

Table 3 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Solem et al., (2015b)	Cross-sectional	PHQ-9 MCQ-30	$N = 224$ Community controls 66.5% female 33.5% male $M = 31.8$, $SD = 13$ years, range 18–67	MCQ-PB / MCQ-NB / MCQ-CC / MCQ-CT / MCQ-SC PHQ-9: $r = 0.23^{**}$ / 0.62^{**} / 0.45^{**} / 0.59^{**} / 0.34^{**} $^{**}p < 0.01$	All correlations were positive and significant, especially for negative beliefs and need to control thoughts subscale In hierarchical regression analysis with PHQ-9 as the outcome variable, metacognition was a significant individual predictor of depressive symptoms. Gender, age, and mindfulness were also entered in the analysis, but only the last was also a predictor in the final step of the equation
Vassilopoulos et al. (2015)	Cross-sectional	BDI-II MCQ-30	$N = 301$ Undergraduate students 86.7% female 13.3% male $M = 20$, $SD = 1.8$ years, range 18–37	MCQ-PB BDI-II: $r = 0.14^{*}$ $^{*}p < 0.05$	Although only the positive beliefs correlation was shown, it was positive and significant
Razavizadeh Tabadkan and Mohammadi Poor (2016)	Cross-sectional	MCQ-30 RRS	$N = 381$ Students	MCQ-PB / MCQ-NB / MCQ-CC / MCQ-CT / MCQ-SC RRS: $r = -0.31^{**}$ / -0.22^{**} / -0.34^{**} / -0.32^{**} / -0.26^{**} $^{**}p < 0.01$	The authors found negative correlations for all subscales Cognitive confidence, positive beliefs, and need to control thoughts were identified as the order of predictor variables. In addition, uncontrollability/danger and cognitive self-consciousness were not found to be significant predictors of rumination responses. What is more relevant is the negative associations of metacognitive beliefs with rumination
Dethier et al. (2017)	Cross-sectional	BDI-II MCQ-30	$N = 262$ Community sample 71.75% female 28.25% male $M = 36.30$, $SD = 14.78$ years, range 18–72	MCQ-PB / MCQ-NB / MCQ-CC / MCQ-CT / MCQ-SC BDI-: $r =$ / 0.54^{*} / 0.29^{*} / 0.43^{*} / 0.25^{*} MCQ-PB / MCQ-NB / MCQ-CC / MCQ-CT / MCQ-SC BDI-II: 0.11 / 0.17^{*} / 0.12 / 0.23^{*} / 0.07 $^{*}p < 0.05$	All correlations were positive and significant, especially for negative beliefs To examine whether metacognitive factors are uniquely associated with anxiety or depression, first-order partial correlations were computed. Anxiety specifically relates to negative beliefs, while depression is related to need to control thoughts

Table 3 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Hagen et al. (2017b)	Cross-sectional	PHQ-9 MCQ-30	$N = 194$ Community sample 69.6% female 30.4% male $M = 34.21$, $SD = 11.26$ years	MCQ-PB: PHQ-9 $r = 0.38$ MCQ-NB: 0.60 MCQ-CC: 0.55 MCQ-CT: 0.57 MCQ-SC: 0.36 All correlations $p < 0.001$	All correlations were positive and significant, especially for negative beliefs, followed by need to control thoughts
Mahoney et al. (2018)	Cross-sectional	PHQ-9 MCQ-30	$N = 292$ Undergraduate students 71.9% female 28.1% male $M = 19.90$, $SD = 3.73$ years	TOTAL MCQ: PHQ-9 $r = 0.48$ $p < 0.001$	Only the MCQ total correlation was shown, which was positive and significant
Palmieri et al. (2018)	Cross-sectional	MCQ-30 RRS	$N = 103$ General population	TOTAL MCQ: RRS $r = 0.73$ $p < .001$	Only the MCQ total correlation was shown, which was positive and significant
Kolubinski et al. (2019)	Cross-sectional	DASS-21-D MCQ-30	$N = 346$ Community participants 67.9% female 32.1% male $M = 42$, $SD = 12.12$ years, range 18–75	MCQ-PB: DASS-D $r = 0.29$ MCQ-NB: 0.67 MCQ-CC: 0.29 MCQ-CT: 0.67 MCQ-SC: 0.36 All $p < 0.01$	All correlations were positive and significant, especially negative beliefs and need to control thoughts subscales, both with the same values
Nordahl et al. (2019)	Cross-sectional	PHQ-9 MCQ-30	$N = 645$ General population 82.6% female 17.4% male $M = 36.26$, $SD = 14.11$ years	MCQ-PB: PHQ-9 $r = 0.36$ MCQ-NB: 0.74 MCQ-CC: 0.50 MCQ-CT: 0.66 MCQ-SC: 0.44 All $^{*}p < 0.01$	All correlations were positive and significant, especially negative beliefs, followed by need to control thoughts

Table 3 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Yılmaz et al. (2011)	Longitudinal 6 months	BDI (T1 and T2) MCQ-30	$N=172$ Students and adults 59.9% female 40.1% males $M=24.14$, $SD=5.74$ years, range 19–47	<table><tr><th></th><th>MCQ-PB</th><th>MCQ-NB</th><th>MCQ-CC</th><th>MCQ-CT</th><th>MCQ-SC</th></tr><tr><td>BDI (T1)</td><td>$r=0.12^{ns}$</td><td>0.37^{**}</td><td>0.25^{**}</td><td>0.21^{**}</td><td>0.03^{ns}</td></tr><tr><td>BDI (T2)</td><td>0.14^{ns}</td><td>0.31^{**}</td><td>0.15^{ns}</td><td>0.13^{ns}</td><td>0.09^{ns}</td></tr></table> $^{**}p<0.01$ Partial correlations controlling for BDI T1 <table><tr><th></th><th></th><th>MCQ-PB</th><th>MCQ-NB</th><th>MCQ-CC</th><th>MCQ-CT</th><th>MCQ-SC</th></tr><tr><td></td><td>T1 BDI Controlled</td><td>0.09^{ns}</td><td>0.16^{*}</td><td>0.03^{ns}</td><td>0.03^{ns}</td><td>0.09^{ns}</td></tr></table> Regressions Time 2 BDI regressed on metacognitions after controlling for time 1 BDI Step 3, Negative beliefs $\beta=0.15$; $p<0.05$	Higher levels of metacognitions were associated with higher levels of depressive symptoms at time 1. Except positive beliefs and self-consciousness, all correlations were positive and significant, especially negative beliefs The metacognitive variable that prospectively and positively correlated with depression was negative beliefs, concerning uncontrollability and danger both before and after the baseline depression level was controlled On step 3, higher levels of negative beliefs about worry concerning uncontrollability and danger prospectively predicted the increase in depression symptoms Besides depression, other variables were also entered: demographic characteristics and stress variables
McEvoy et al. (2013)	Longitudinal Days Study 1 $M=18.27$ $SD=10.51$	BDI-II MCQ-30 RTQ-L First factor-RNT	Study 1 $N=175$ Undergraduate students 61% female 39% male $M=19.71$, $SD=1.97$ years, range 17–31	<table><tr><th></th><th>MCQ-PB</th><th>MCQ-NB</th><th>MCQ-CC</th><th>MCQ-CT</th><th>MCQ-SC</th></tr><tr><td>RNT</td><td>0.29^{***}</td><td>0.75^{***}</td><td>0.43^{**}</td><td>0.47^{***}</td><td>0.44^{***}</td></tr></table> $^{***}p<0.001$ Regression <table><tr><th></th><th>BDI</th><th>MCQ-PB</th><th>MCQ-NB</th><th>MCQ-CC</th><th>MCQ-CT</th><th>MCQ-SC</th></tr><tr><td>RNT</td><td>0.17</td><td>0.16</td><td>0.49</td><td>−0.02</td><td>0.01</td><td>0.02</td></tr></table>	Design: Participants at time 1 completed the measures in anticipation of a stressor The Repetitive Negative Thinking (RNT) scale was significantly correlated with the total score and all MCQ-30 subscales. The authors found the same results with the reduced version of the RNT Even after controlling for depressive symptoms in regression analysis, negative and positive beliefs subscales were significant and positive predictors of RNT. Likewise, other variables were also entered in the analyses predicting RNT: anxiety, cognitive avoidance, and thought control

Table 3 (continued)

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
	Days Study 2 *M* = 11.89 *SD* = 4.47		Study 2 *N* = 91 Undergraduate students 82.4% female 17.6% male *M* = 20.11, *SD* = 4.18 years, range 17–42	Regression RNT pre-stressor Step: 2 MCQ (pre) BDI-II (pre) β = 0.13 Negative beliefs β = 0.27 Cognitive confidence β = −0.04 Need to control thoughts β = 0.29 Self-consciousness β = 0.03 RNT post-stressor Step 2: MCQ (post) BDI-II (post) β = 0.11 Positive beliefs β = 0.12 Negative beliefs β = 0.29 Cognitive confidence β = −0.07 Need to control thoughts β = 0.44 Self-consciousness β = −0.11	At time 2, participants completed the measures both before and after a stressor BDI-II significantly predicted RNT at both the pre-stressor and post-stressor When pre- and post-stressor RNT were the criterion variables, pre- and post-stressor BDI-II were entered as step 1, and pre- and post- MCQ subscale scores significantly correlated with RNT were entered in step 2. Final models for the MCQ were significant for both pre- and post-stressor. The negative beliefs and need to control thoughts subscales were the only unique predictors of both pre- and post-stressor RNT
Ruiz and Odriozola-González (2015)	Longitudinal 9 months	DASS-D MCQ-30	*N* = 286 at T1 General population 59.5% female 40.5% male *M* = 35.38, *SD* = 8.63 years, range 22–82 *N* = 106 at T2	T1: MCQ-PB; MCQ-NB; MCQ-CT DASS-D: *r* = 0.11^{ns}; 0.43**; 0.30** T2: MCQ-PB; MCQ-NB; MCQ-CT DASS-D: *r* = 0.17; 0.55**; 0.40** $^{**}p < 0.01$	Except positive beliefs, all correlations were positive and significant, especially for negative beliefs At time 1, DASS-D was not controlled

HADS-D Hospital Anxiety and Depression Scale, Depression subscale (Zigmond & Snaith, 1983), *MCQ-30* Meta-Cognitions Questionnaire-30, *MCQ-PB* Positive beliefs about worry, *MCQ-NB* Negative beliefs about worry, *MCQ-CC* Cognitive confidence, *MCQ-CT* Need to control thoughts, *MCQ-SC* Self-consciousness (Wells & Cartwright-Hatton, 2004), *MCQ-65* Meta-Cognitions Questionnaire (Cartwright-Hatton & Wells, 1997), *BDI* Beck Depression Inventory (Beck & Steer, 1987), *GHQ-D* General Health Questionnaire Depression subscale (Goldberg & Hillier, 1979), *DASS-21-D* Depression and Anxiety Stress Scale short form, Depression subscale (Lovibond & Lovibond, 1995), *RTS* Ruminative Thought Style Questionnaire (Brinker & Dozois, 2009), *PHQ-9* Patient Health Questionnaire 9-item (Spitzer et al., 1999), *BDI-II* Beck Depression Inventory-II (Beck et al., 1996), *RRS* Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991), *RTQ-L* Repetitive Thinking Questionnaire- Looming version, *RNT* Repetitive Negative Thinking, first factor of the RTQ-L (McEvoy et al., 2010)

Table 4 Studies performed with MCQ-30 using clinical samples

Study	Assessment time	Instruments	Sample	Statistical analyses and statistic	Summary of results
Sarisoy et al. (2013)	Cross-sectional	BDI MCQ-30	$N=51$ Unipolar depression 64.7% female 35.3% male $M=39.65$, $SD=12.84$ years	Correlations MCQ-PB: BDI $r=0.13^{ns}$ MCQ-NB: BDI 0.28^{ns} MCQ-CC: BDI 0.10^{ns} MCQ-CT: BDI 0.44^{**} MCQ-SC: BDI 0.08^{ns} $^{**}p<0.01$	Only the need to control thoughts showed a significant correlation with BDI
Solem et al. (2015a)	Cross-sectional	BDI-II MCQ-30	$N=168$ $N=37$ Currently depressed 73% female 27% male $M=37.49$, $SD=11.98$ years, range 18–60 $N=81$ Previously depressed 88% female 12% male $M=37.42$, $SD=9.61$ years, range 20–63 $N=50$ Never depressed 78% female 22% male $M=38.06$, $SD=12.66$ years, range 21–65	MCQ-PB: BDI-II $r=0.23^{***}$; Partial 0.22^{**} MCQ-NB: BDI-II 0.60^{***}; Partial 0.23^{**} MCQ-CC: BDI-II 0.44^{***}; Partial 0.29^{***} MCQ-CT: BDI-II 0.47^{***}; Partial 0.17^{*} MCQ-SC: BDI-II 0.17^{**}; Partial 0.08^{ns} $^{***}p<0.001$ Regressions MCQ-PB: BDI-II β = 0.10, p = 0.03 MCQ-NB: BDI-II 0.11, p = 0.05 MCQ-CC: BDI-II 0.13, p = 0.02 MCQ-CT: BDI-II −0.01, p = 0.87 MCQ-SC: BDI-II 0.00, p = 0.98	Zero-order: All correlations were positive and significant, especially for negative beliefs Partial (controlling anxiety): Except self-consciousness—although reduced—all correlations were positive and significant, especially cognitive confidence The entered variables in the analyses were: anxiety in step 1, mindful attention awareness in step 2, and MCQ subscales in step 3 Four variables emerged as significant predictors of depression severity: anxiety, cognitive confidence, positive beliefs about worry, and negative beliefs about worry
Faissner et al. (2018)	Longitudinal 3.5 years	HAMD (clinician) BDI-II (self-reported) MCQ-30	$N=84$ Depressed patients 74% female 26% male $M=45.46$, $SD=9.89$ years	Longitudinal latent growth model Predictors of change in clinician-assessed depression Step 3 Initial status of NB (intercept) β = 0.31, $p<0.057$ Change in NB (slope) β = 0.40, $p<0.015$ Predictors of change in self-assessed depression Step 3 Initial status of NB (intercept) β = 0.31; $p<0.011$ Change in NB (slope) β = 0.42; $p<0.001$ Initial status of CT (intercept) β = 0.33; $p<0.007$ Change in CT (slope) β = 0.31; $p<0.013$	Only initial status and change of negative beliefs had a significant effect on the change in the HAMD For self-assessed depression, initial status and change, in both negative beliefs and need to control thoughts, had a significant effect on the change in the BDI-II No other variables were entered

BDI Beck Depression Inventory (Beck & Steer, 1987), *MCQ-30* Meta-Cognitions Questionnaire-30, *MCQ-PB* Positive beliefs about worry, *MCQ-NB* Negative beliefs about worry, *MCQ-CC* Cognitive confidence, *MCQ-CT* Need to control thoughts, *MCQ-SC* Self-consciousness (Wells & Cartwright-Hatton, 2004), *BDI-II* Beck Depression Inventory-II (Beck et al., 1996), *HAMD* Hamilton Depression Rating Scale (Hamilton, 1960)

metacognitions had independent contributions to depression. This finding is in line with previous studies and with the metacognitive model, but contrary to the model, negative metacognitions and rumination did not predict symptom recurrence. The authors concluded that although reduced metacognition is likely to reduce depressive symptoms, this

phenomenon is probably not enough to prevent the recurrence of symptoms in the next 12 months (Kraft et al., 2019).

In sum, the results of the studies reviewed in this section show the following, regardless of the sample used: (a) the PBRS is associated with rumination and depression, both cross-sectionally and longitudinally, although it is more strongly correlated with rumination; (b) the NBRS is associated with rumination and depression, both cross-sectionally and longitudinally, although in this case the NBRS is more strongly correlated with depression; (c) studies using path analyses confirm the metacognitive model, showing that positive beliefs lead to rumination and that rumination leads to depressive symptoms both directly and indirectly through negative metacognitive beliefs; and (d) there are contradictory results with respect to which NBRS subscale leads to depression in path analyses.

Results with the MCQ-30

From the 25 studies we identified, 22 used a nonclinical sample (19 cross-sectional and three longitudinal) and three used a clinical sample (two cross-sectional and one longitudinal). Most studies examined the associations between each of the five MCQ-30 subscales. Furthermore, the vast majority (21 studies) examined the associations with depression, only three with rumination, and the remaining one with both variables.

Nonclinical Sample

All studies used a convenience sample: 12 of them used undergraduate students, eight community samples, and two a mixture of both. In general, regardless of the instrument used to measure depression, the results of the reviewed studies demonstrated that metacognitive beliefs are positively and significantly correlated with depression. From the studies that examined the specific effect of each MCQ subscale, there were stronger associations with depression for the negative beliefs subscale, followed by the need to control thoughts subscale. Moreover, Dethier et al. (2017) found that these results remained even after controlling for anxiety, a variable classically associated with the MCQ. Only two studies examined associations with rumination; they found contradictory results. Razavizadeh Tabadkan and Mohammadi Poor (2016) found negative correlations for all MCQ subscales and rumination, while Palmieri et al. (2018) only examined the MCQ total correlation and found a positive and significant correlation. Finally, Karatepe et al. (2013) examined associations of two MCQ subscales—negative beliefs and need to control thoughts—with both depression and rumination. Their results showed that correlations between these subscales and rumination were stronger than with depression.

Three studies used a longitudinal design with a nonclinical sample. First, McEvoy et al. (2013) examined associations between metacognitive beliefs and rumination in two studies; they found that negative beliefs showed the strongest positive associations with rumination, followed by the need to control thoughts subscale (study 1), and that these subscales were the only unique predictors of rumination (study 2). Subsequently, Yilmaz et al. (2011), using a six-month follow-up interval, found that negative beliefs concerning uncontrollability and danger predicted depressive symptoms, after controlling for the baseline depression level. Finally, Ruiz and Odriozola-González (2015) conducted the study with the longest time interval (nine months) and the largest sample ($N = 286$ at time 1) and examined the associations between depression and three of the five MCQ subscales (positive beliefs, negative beliefs, and need to control thoughts). Again, negative beliefs and the need to control thoughts were the two subscales most strongly related to depression at both times 1 and 2; however, they did not control for depression at time 1 in the analyses.

Clinical Sample

The three studies conducted with a clinical sample examined the associations between metacognitive beliefs and depression. In two studies, participants were patients with actual MDD, and the other one compared groups of currently depressed, previously depressed, and never depressed individuals.

The two cross-sectional studies reported different results. Sarisoy et al. (2013) showed that only the MCQ need to control thoughts subscale had significant associations with depression even though they used a small sample ($N = 51$). On the other hand, Solem et al. (2015a) found that the negative beliefs subscale showed the strongest correlations with depression, followed by the need to control thoughts subscale. The regression analyses showed that cognitive confidence, positive beliefs, and negative beliefs emerged as significant predictors of depression severity.

Only one study (Faissner et al., 2018) used a longitudinal design in a clinical sample, with a time interval of 3.5 years. They measured the severity of depression using both clinician-rated and self-report measures. According to the regression analysis, the negative beliefs subscale (initial status and change) was the only predictor of change in clinician-assessed depression. In the case of self-reported depression, both the negative beliefs and need to control thoughts subscales (initial status and change) had a significant effect on the change in the BDI. These results again indicate the importance of the negative beliefs subscale.

In summary, the vast majority of studies reviewed in this section have examined the associations between metacognitive beliefs and depression, and the results have shown

that the most relevant subscale is the negative beliefs about worry, followed by the need to control thoughts. Few studies have measured rumination to examine its associations with metacognitive beliefs, but the results seem to point in the same direction. These results have also been corroborated in longitudinal studies, where the negative beliefs subscale also showed more relevance.

Meta-Analysis

In order to statistically combine the correlation coefficients, they were first converted into Fisher's Z scores in order to avoid that the sampling variance is correlated to the magnitude of the effect size. For providing the results, Fisher's Z were back transformed to correlation coefficients (the formulas can be found in Cooper et al., 2019, pp. 220–221). Most studies that used the instrument NBRS did not report the correlation of the total NBRS scale, but the correlation of the subdimensions (NBRS uncontrollability and harm and NBRS social consequences). Within these studies, a composite correlation between the subdimensions was obtained in order to get an overall correlation between NBRS and depression and rumination. To obtain this composite correlation, we followed the procedure explained in Borenstein et al., (2009, p. 225), assuming a correlation of 0.57 between NBRS subscales (Papageorgiou & Wells, 2003).

A random-effects model was performed, given that substantial heterogeneity was observed across studies. The I^2 index was used to quantify the amount of heterogeneity (Higgins & Thompson, 2002) and can be interpreted as the percentage of variance observed that is due to between-studies variability. A meta-analysis was performed if there were more than five effect sizes available for a given correlation (see supplementary material for further information). Analyses were done in R, using the *metafor* package (Viechtbauer, 2010).

Publication Bias

The presence of publication bias was explored through the visual inspection of the funnel plot (see supplementary material) and through the Egger regression test (Egger et al., 1997). These analyses were only carried out on those subsets of data where more than 10 effect sizes were available. The visual inspection of the funnel plots revealed some asymmetries for the correlation between the MCQ negative beliefs and depression and between the NBRS negative beliefs with both variables, rumination and depression. For these correlations, less precise studies showed more attenuated correlations than more precise studies, meaning that the overall effect sizes might be slightly attenuated. Thus, the Egger regression test indicated that publication bias could exist in the correlations already mentioned, with all showing the same trend: highly precise studies show larger effect sizes.

Associations Between Metacognitive Beliefs and Rumination and Depression

Pooled correlations between the PBRS and NBRS scales with depression and rumination were all significant (see Table 5). Correlations of higher magnitude were found between NBRS uncontrollability and harm subscale with rumination and depression, respectively. Regarding the PBRS, we found a pooled correlation of moderate magnitude between the PBRS and rumination, whereas correlation with depression was the lowest. All the I^2 indices, except for PBRS and depression and for NBRS (total) and rumination, were higher than 75%, meaning that there was a substantial between-studies variability (Table 5).

In the case of the MCQ scale, only pooled correlations with depression are shown ($k > 5$). All the pooled correlations were statistically significant (Table 5). The higher correlation was found between MCQ negative beliefs subscale and depression, followed by the pooled correlation between MCQ need to control thoughts and depression. The lowest correlation was found for MCQ self-consciousness. All the I^2 indices, except for the MCQ positive beliefs subscale, were higher than 75% (Table 5).

We carried out a series of meta-regression models to investigate the effect of three moderator variables: type of instrument used to measure metacognitive beliefs (PRBS/NBRS vs. MCQ), type of sample (clinical vs. nonclinical), and the proportion of women in the sample. The pooled effect size and the difference among the pooled Fisher's Z were calculated together with a statistical test that investigated whether this difference was statistically relevant. Data showed that no statistical differences were observed across types of instruments or types of samples. However, there were significant results for the moderator variable proportion of women in the sample. In the case of the MCQ, correlations between depression and the subscales negative beliefs, need to control thoughts and cognitive confidence were stronger the more women there were in the sample. No effect of the percentage of women were found for the correlations involving PBRS/NBRS. It is important to note that the lack of statistically significant results in some analyses (differences in rumination between type of instrument or by type of sample) can be explained by the lack of statistical power. For further information, see the supplementary material.

Two-Stage Structural Equation Modeling Approach

To carry out a meta-analysis on the theoretical metacognitive model of rumination and depression, we used the

Table 5 Pooled correlations between the scales (PBRS/NBRS and MCQ) and depression and rumination

	k	Pooled (*r*)	SE	Z	*P*	Tau	I^2
PBRS/NBRS							
NBRS_DEP	10	0.495	0.054	10.05	<0.001	0.019	73.67
NBRS_R	9	0.465	0.038	13.13	<0.001	0.005	40.57
NBRS (Uncontroll & harm)_DEP	8	0.555	0.064	7.83	<0.001	0.029	91.34
NBRS (Uncontroll & harm)_R	7	0.633	0.065	8.59	<0.001	0.026	91.06
NBRS (Social)_DEP	8	0.470	0.053	8.26	<0.001	0.019	87.03
NBRS (Social)_R	7	0.439	0.042	9.88	<0.001	0.009	77.30
PBRS_DEP	12	0.275	0.016	16.98	<0.001	0.000	0.23
PBRS_R	13	0.504	0.036	12.78	<0.001	0.012	75.38
R_DEP	9	0.704	0.057	10.73	<0.001	0.024	88.51
MCQ-30							
MCQ-PB_DEP	19	0.235	0.024	9.74	<0.001	0.006	56.85
MCQ-NB_DEP	20	0.617	0.040	13.71	<0.001	0.026	85.70
MCQ-CC_DEP	16	0.380	0.035	10.48	<0.001	0.014	76.58
MCQ-CT_DEP	19	0.470	0.044	10.06	<0.001	0.030	87.69
MCQ-SC_DEP	16	0.222	0.042	5.26	<0.001	0.022	84.06

DEP Depression, *R* Rumination, *NBRS* Negative Beliefs about Rumination Scale (Papageorgiou & Wells, 2001a), *PBRS* Positive Beliefs about Rumination Scale (Papageorgiou & Wells, 2001b), *MCQ-30* Meta-Cognitions Questionnaire-30, *MCQ-PB* Positive beliefs about worry, *MCQ-NB* Negative beliefs about worry, *MCQ-CC* Cognitive confidence, *MCQ-CT* Need to control thoughts, *MCQ-SC* Self-consciousness (Wells & Cartwright-Hatton, 2004)

TSSEM approach proposed by Cheung and Chan (2005). This analysis was done only on the subset of studies that used the PBRS/NBRS measures ($k = 16$; $n = 4477$). The first stage of this approach consists of pooling together the correlation matrices extracted from each study, obtaining a pooled correlation matrix. In this stage, a homogeneity test and goodness-of-fit indexes are provided to see whether a fixed-effect model should be fitted (which assumes that all correlation matrices stem from a common population correlation matrix) or whether a random-effects model is more appropriate (which assumes that all correlation matrices stem from different population correlation matrices). In the second stage, the pooled correlation matrix obtained in Stage 1 is used to fit a path analysis, specifying the theoretical model displayed in Fig. 1. The fit of the path model was evaluated by looking at the root mean square error of approximation (RMSEA) and at the comparative fit index CFI (CFI). A value of RMSEA below 0.06 and a value of CFI above 0.95 were considered an acceptable fit (Hu & Bentler, 1999). Likelihood-based confidence intervals are reported instead of the traditional confidence intervals (Cheung, 2009). Analyses were undertaken in R using the *metaSEM* package (Cheung, 2015).

The homogeneity test at Stage 1 indicated that substantial heterogeneity existed across correlation matrices ($X^2 = 212.46$; df = 59, $p < 0.002$). However, this homogeneity test is conservative, and the CFI indicated that the fit was adequate (CFI = 0.965). Therefore, a fixed-effect model was assumed for this stage. Figure 1 contains the parameter estimates obtained after carrying the path analysis at Stage 2, using the pooled correlation matrix obtained in Stage 1 (see supplementary material). Likelihood-based confidence intervals indicate that all regression coefficients were significantly different from zero and were positive. The fit of this path model was adequate (CFI = 0.999; RMSEA = 0.021).

Discussion

The present review has focused on studies that examined the empirical evidence of the metacognitive model of rumination and depression. We reviewed and analyzed studies that examined the link between metacognitive beliefs and rumination, between metacognitive beliefs and depression, and, together, the interplay between metacognitive beliefs, rumination, and depression.

The principal conclusion that can be drawn from these reviewed studies is that metacognitive beliefs are associated with both rumination and depression. That is, people who hold dysfunctional metacognitive beliefs show higher levels of rumination as well as higher levels of depressive symptomatology. This result is consistent in both clinical and nonclinical samples, regardless of the measure employed to assess metacognitive beliefs (e.g., PBRS/NBRS, PBRS-A, or MCQ), and across different populations and study designs, with the same trend being found in cross-sectional or prospective studies. Moreover, according to the meta-analysis, negative metacognitive beliefs showed the strongest pooled

correlations with both rumination and depression. Other more specific conclusions can also be drawn.

Studies that have used the PBRS and NBRS are especially informative about the metacognitive model of rumination and depression because these instruments are focused on dysfunctional metacognitive beliefs about rumination. Taken together, the narrative synthesis and the meta-analysis evinced that positive beliefs are more strongly associated with rumination than depression, whereas negative beliefs are similarly (and moderately) associated with both rumination and depression. Specifically, when comparing both subscales of the NBRS, the uncontrollability and harm subscale showed the strongest pooled correlation for both rumination and depression, respectively.

Likewise, studies that have used the MCQ-30 are also informative. Although some of the MCQ subscales are focused on worry, the MCQ is a widely used measure to assess metacognitive beliefs. In this case, most studies have focused on examining the links with depression. Thus, both narrative synthesis and meta-analysis have reported the same trend found so far with the PBRS/NBRS: negative metacognitive beliefs were the most strongly associated with depression. It is also noteworthy that all the other MCQ subscales were positively associated with depression, mainly the need to control thoughts subscale. These results suggest the relevance of examining the role of other metacognitive beliefs (in addition to positive and negative beliefs) in depression. On the other hand, taking into account that the MCQ is focused on worry (and not on rumination), these results are supportive of the idea that metacognitive beliefs are a transdiagnostic factor in psychopathology (Luca, 2019; Sun et al., 2017; Wells, 2019).

The meta-regression models showed that there were no differences in associations between metacognitive beliefs and rumination and depression based on the type of measure or sample. Therefore, results were consistent regardless of the instrument used, the PBRS/NBRS or the MCQ, and regardless of whether it is a clinical or nonclinical population. However, these results must be interpreted cautiously since there is an evident lack of statistical power. Given that previous studies have found gender differences in rumination (women ruminate more than men; Johnson & Whisman, 2013), we examined whether the proportion of women in studies might yield stronger effect sizes in associations between metacognitive beliefs and rumination and depression. No significant differences were found for rumination. However, we found that studies with a higher proportion of women showed stronger associations between some of the MCQ subscales (negative beliefs, cognitive confidence, need to control thoughts) and depression. This result suggests that the association between MCQ and depression is particularly relevant for women and suggests the need to consider gender in future research. Finally, an examination of the results in the narrative synthesis with respect to the design show that they were consistent regardless of whether it was a cross-sectional or longitudinal study.

Of particular relevance are the results of the TSSEM testing the metacognitive model of rumination and depression. When considering the studies examining the associations between the PBRS/NBRS and rumination/depression together, results of path analysis support the principal tenets of the model, namely that positive beliefs lead people to use rumination and that rumination, in turn, leads to the activation of negative beliefs involved in an increase in depressive symptoms (Papageorgiou & Wells, 2003, 2004; Wells, 2009). Thus, we found that positive beliefs were moderately associated with rumination, whereas rumination was both directly and indirectly associated with depression, also moderately, via negative beliefs. Previous studies that have tested the metacognitive model using path analyses have drawn contradictory conclusions about which NBRS subscale contributes more to depression; in this sense, our results can be enlightening. The TSSEM results indicated that the uncontrollability and harm subscale showed the strongest association with depression.

Altogether, the results of the reviewed and analyzed studies are in line with the metacognitive model, which suggests that positive and negative beliefs about rumination are key factors in understanding why people ruminate and get depressed. Specifically, we conclude that positive beliefs are more strongly associated with rumination, and negative beliefs are more strongly associated with both rumination and depression. Furthermore, those studies performed with the MCQ-30 have revealed the relevance of the metacognitive beliefs about the need to control thoughts, suggesting that it could be interesting to consider the role of this metacognitive belief in future reviews of the metacognitive model of rumination and depression.

While analyzing the literature in this field, we identified several limitations. First, there is a considerable heterogeneity among effect sizes across studies, which indicates that study characteristics might moderate the magnitude of the effect. Future meta-analysis could further explore this issue. Second, for three correlations, we found some evidence of publication bias. These analyses indicated that highly precise studies showed larger effect sizes, meaning that the observed pooled correlations might be somewhat attenuated. Third, a considerable number of studies have used cross-sectional and longitudinal designs, but no studies have employed experimental paradigms. This factor precludes causal inferences. The metacognitive model postulates that metacognitive beliefs are relatively malleable, so future research may be interested in experimentally manipulating metacognitive beliefs. There are precedents from the study of meta-emotion beliefs. For example, De Castella et al. (2018) examined whether people's beliefs about their ability to control their

emotions play a causal role in relevant psychological outcomes. For that purpose, the authors experimentally manipulated the emotional beliefs of participants and found initial evidence for their causal role in avoidance-based emotion regulation. Similar procedures could be used in the context of metacognitive beliefs. Fourth, there is a scarcity of instruments that assess dysfunctional metacognitive beliefs. Although our analyses found that there are no differences between instruments used, this can be explained for an evident lack of statistical power, which encourages further examination since research on the metacognitive model could benefit from the development of more diverse instruments considering the scarcity of metacognitive measures. In this sense, instruments avoiding words that refer to rumination and/or depression, such as the PBRS-A, are especially welcome. Fifth, while those studies that tested the metacognitive model used path analysis, it would be worth using structural equation model (SEM) analysis because this methodology minimizes measurement error. And lastly, few studies have examined the link between metacognitive beliefs and rumination and/or depression while controlling for other relevant variables that might influence these associations. Studies that control for rumination/depression-related constructs, such as anxiety levels or worry, are needed to confirm the specific hypothesis of the metacognitive model of rumination and depression.

The insights from the included studies, as well as their limitations, suggest several lines of research to fill gaps in the literature and extend current knowledge. Despite TSSEM results suggesting that the uncontrollability and harm subscale is the one most strongly associated with depression, further research is needed to clarify this issue. It is possible that a third variable may help to explain why metacognitive beliefs about the uncontrollability and harm subscale appear to be more important than the ones about social consequences. One possible moderator variable would be cognitive schemas. Beck (1983) identified two core cognitive schemas: (1) sociotropy schemas, which refer to an excessive value on close interpersonal relationships and social dependence; and (2) autonomy schemas, which reflect an investment in preserving independence and freedom. In this sense, we hypothesize that whereas metacognitive beliefs about social consequences of rumination are more relevant in predicting depression in individuals with high sociotropic schemas, metacognitive beliefs about the need to control thoughts in order to achieve that autonomy are more relevant for individuals higher in autonomy schemas. On the other hand, more research is needed to clarify the mechanism by which negative beliefs are linked to depression. The metacognitive model proposes that negative beliefs lead people to appraise their own rumination as uncontrollable and dangerous, thus increasing the accessibility to negative information (e.g., negative emotions or thoughts) and enhancing depressive symptomatology. However, it is possible that other variables mediate the associations between negative beliefs and depression. For example, people with negative beliefs about social consequences could be prone to use maladaptive strategies, such as emotional suppression, which in turn has social costs, whereas people with negative beliefs about uncontrollability and harm could be prone to use other maladaptive strategies that aim to stop or avoid their rumination, such alcohol or drug abuse. Research on the association between metacognitive beliefs and these and other emotion regulation strategies linked to depression (i.e., inactivity) may lead to a more complete understanding of the role of metacognitive beliefs in depression.

In conclusion, this review gathers the empirical evidence obtained for the metacognitive model of rumination and depression and highlights its relevance and utility. Increasing knowledge about the role of metacognitive beliefs in rumination and depression has clinical implications. Metacognitive therapy (MCT) seems to be a promising treatment for depression. The goals of this intervention are to promote a metacognitive model of thinking, enhance attentional resources through cognitive training, and modify metacognitive beliefs. More specifically, MTC suggests particular interventions to promote this metacognitive thinking mode, where the therapist explicitly teaches the patient how to induce and retain this type of processing. These techniques include, among others, metacognitive focused exposure, metacognitive experiments, meta-level discourse, free-association tasks, rumination postponement, and worry-modulation procedures. Therefore, these techniques, when used, increase the range, choice, and flexibility with which the patient can relate to inner thoughts, memories, and events. Full descriptions of these techniques can be found elsewhere (Wells, 2009). Research could improve this therapy by investigating what types of negative beliefs are most important to each individual, knowing in depth what processes are involved, and thus focusing treatment on the most relevant aspects.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10608-021-10260-2.

Funding Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature. This study was part of a project funded by Spanish Government (Grant Number: PSI2017-83463-R).

Declarations

Conflict of Interest Julia B. Cano-López, Esperanza García-Sancho, Belén Fernández-Castilla, and José M. Salguero have no competing interests.

Animal Rights No animal studies were carried out by the authors for this article.

References

Articles marked with an asterisk were included in the systematic review.

*Barahmand, U. (2008). Using metacognitions to identify emotionally vulnerable college students. *American Journal of Health Behavior, 32*(6), 604–613. https://doi.org/10.5993/ajhb.32.6.5.

Beck, A. T. (1983). Cognitive therapy of depression: New perspectives. In P.-J. Clayton & J. E. Barrett (Eds.), *Treatment of depression: Old controversies and new approaches* (pp. 265–290). Raven Press.

Beck, A. T., & Steer, R. A. (1987). *Manual for the Beck Depression Inventory*. The Psychological Corporation.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory: Manual* (2nd ed.). The Psychological Corporation.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*(6), 561–571. https://doi.org/10.1001/archpsyc.1961.01710120031004

Beshai, S., Dobson, K. S., Bockting, C. L., & Quigley, L. (2011). Relapse and recurrence prevention in depression: Current research and future prospects. *Clinical Psychology Review, 31*, 1349–1360. https://doi.org/10.1016/j.cpr.2011.09.003

Bieling, P. J., Antony, M. M., & Swinson, R. P. (1998). The state-trait anxiety inventory, trait version: Structure and content re-examined. *Behaviour Research and Therapy, 36*, 777–788. https://doi.org/10.1016/s0005-7967(98)00023-0

Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Wiley.

Brinker, J. K., & Dozois, J. A. (2009). Ruminative thought style and depressed mood. *Journal of Clinical Psychology, 65*(1), 1–19. https://doi.org/10.1002/jclp.20542

*Cangas, A. J., Errasti, J. M., García-Montes, J. M., Álvarez, R., & Ruiz, R. (2006). Metacognitive factors and alterations of attention related to predisposition to hallucinations. *Personality and Individual Differences, 40*(3), 487–496. https://doi.org/10.1016/j.paid.2005.07.005.

Cartwright-Hatton, S., & Wells, A. (1997). Beliefs about worry and intrusions: The metacognitions questionnaire and its correlates. *Journal of Anxiety Disorders, 11*, 279–296. https://doi.org/10.1016/s0887-6185(97)00011-x

Cheung, M.W.-L. (2009). Constructing approximate confidence intervals for parameters with structural equation models. *Structural Equation Modeling, 16*, 267–294. https://doi.org/10.1080/10705510902751291

Cheung, M. W. L. (2015). metaSEM: An R package for meta-analysis using structural equation modeling. *Frontiers in Psychology, 5*, 1521. https://doi.org/10.3389/fpsyg.2014.01521

Cheung, M. W. L., & Chan, W. (2005). Meta-analytic structural equation modeling: A two-stage approach. *Psychological Methods, 10*, 40–64. https://doi.org/10.1037/1082-989X.10.1.40

Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2019). *The handbook of research synthesis and meta-analysis*. Russell Sage Foundation.

De Castella, K., Platow, M. J., Tamir, M., & Gross, J. (2018). Beliefs about emotion: Implications for avoidance-based emotion regulation and psychological health. *Cognition and Emotion, 32*(4), 773–795. https://doi.org/10.1080/02699931.2017.1353485

*Dethier, V., Heeren, A., Bouvard, M., Baeyens, C., & Philippot, P. (2017). Embracing the structure of metacognitive beliefs: Validation of the French Short Version of the Metacognitions Questionnaire. *International Journal of Cognitive Therapy, 10*(3), 219–233. https://doi.org/10.1521/ijct.2017.10.3.219.

Egger, M., Davey-Smith, G., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *British Medical Journal, 315*, 629–634.

*Faissner, M., Kriston, L., Moritz, S., & Jelinek, L. (2018). Course and stability of cognitive and metacognitive beliefs in depression. *Depression and Anxiety, 35*(12), 1239–1246. https://doi.org/10.1002/da.22834.

*Gawęda, Ł., & Kokoszka, A. (2014). Meta-cognitive beliefs as a mediator for the relationship between Cloninger's temperament and character dimensions and depressive and anxiety symptoms among healthy subjects. *Comprehensive Psychiatry, 55*(4), 1029–1037. https://doi.org/10.1016/j.comppsych.2013.10.013.

Goldberg, D. P., & Hillier, V. F. (1979). A scaled version of the General Health Questionnaire. *Psychological Medicine, 9*(1), 139–145. https://doi.org/10.1017/s0033291700021644

Hagen, R., Hjemdal, O., Solem, S., Kennair, L. E. O., Nordahl, H. M., Fisher, P., & Wells, A. (2017a). Metacognitive therapy for depression in adults: A waiting list randomized controlled trial with six months follow-up. *Frontiers in Psychology, 8*, 31. https://doi.org/10.3389/fpsyg.2017.00031

*Hagen, K., Solem, S., Opstad, H. B., Hansen, B., & Hagen, R. (2017b). The role of metacognition and obsessive-compulsive symptoms in psychosis: An analogue study. *BMC, Psychiatry, 17,* 233. https://doi.org/10.1186/s12888-017-1392-1.

Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery, and Psychiatry, 23*(1), 56–62. https://doi.org/10.1136/jnnp.23.1.56

Higgins, J. P. T., & Thompson, S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine, 21*, 1539–1558. https://doi.org/10.1002/sim.1186

Hjemdal, O., Hagen, R., Solem, S., Nordahl, H., Kennair, L. E. O., Ryum, T., Nordahl, H. N., & Wells, A. (2017). Metacognitive therapy in major depression: An open trial of comorbid cases. *Cognitive and Behavioral Practice, 24*(3), 312–318. https://doi.org/10.1016/j.cbpra.2016.06.006

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

*Huntley, C. D., & Fisher, P. L. (2016). Examining the role of positive and negative metacognitive beliefs in depression. *Scandinavian Journal of Psychology, 57*(5), 446–452. https://doi.org/10.1111/sjop.12306.

Johnson, D. P., & Whisman, M. A. (2013). Gender differences in rumination: A meta-analysis. *Personality and Individual Differences, 55*(4), 367–374. https://doi.org/10.1016/j.paid.2013.03.019

Joormann, J., & Quinn, M. E. (2014). Cognitive processes and emotion regulation in depression. *Depression and Anxiety, 31*(4), 308–315. https://doi.org/10.1002/da.22264

*Karatepe, H. T., Yavuz, F. K., & Turkcan, A. (2013). Validity and reliability of the Turkish version of the Ruminative Thought Style Questionnaire. *Klinik Psikofarmakoloji Bülteni/Bulletin of Clinical Psychopharmacology, 23*(3), 231–241. https://doi.org/10.5455/bcp.20121130122311

Kessler, R. C., & Bromet, E. J. (2013). The epidemiology of depression across cultures. *Annual Review of Public Health, 9*, 119–138. https://doi.org/10.1146/annurev-publhealth-031912-114409

*Kolubinski, D. C., Marino, C., Nikčević, A. V., & Spada, M. M. (2019). A metacognitive model of self-esteem. *Journal of Affective Disorders, 256*, 42–53. https://doi.org/10.1016/j.jad.2019.05.050

*Kraft, B., Jonassen, R., Ulset, V., Stiles, T., & Landrø, N. I. (2019). A prospective test of the metacognitive model of depression in previously depressed individuals. *Cognitive Therapy and Research, 43*, 603–610. https://doi.org/10.1007/s10608-018-9972-z

*Kubiak, T., Zahn, D., Siewert, K., Jonas, C., & Weber, H. (2014). Positive beliefs about rumination are associated with ruminative thinking and affect in daily life: Evidence for a metacognitive view on depression. *Behavioural and Cognitive Psychotherapy, 42*(5), 568–576. https://doi.org/10.1017/s1352465813000325

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression, anxiety and stress scales* (2nd ed.). Psychology Foundation.

Luca, M. (2019). Maladaptive rumination as a transdiagnostic mediator of vulnerability and outcome in psychopathology. *Journal of Clinical Medicine, 8*(3), 314. https://doi.org/10.3390/jcm8030314

Luminet, O. (2004). Measurement of depressive rumination and associated constructs. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination. Nature, theory and treatment* (pp. 187–215). Chichester, England: Wiley.

Lyubomirsky, S., & Tkach, C. (2004). The consequences of dysphoric rumination. In C. Papageorgiou & A. Wells (Eds.), *Depressive rumination: Nature, theory, and treatment* (pp. 21–42). Wiley.

*Mahoney, A. E. J., Hobbs, M. J., Williams, A. D., Andrews, G., & Newby, J. M. (2018). The mediating relationship between maladaptive behaviours, cognitive factors, and generalised anxiety disorder symptoms. *Behaviour Change, 35*(2), 123–138. https://doi.org/10.1017/bec.2018.13

*Matsumoto, N., & Mochizuki, S. (2018). Why do people overthink? A longitudinal investigation of a meta-cognitive model and uncontrollability of rumination. *Behavioural and Cognitive Psychotherapy, 46*(4), 504–509. https://doi.org/10.1017/s1352465818000103

McEvoy, P. M., Mahoney, A. E., & Moulds, M. L. (2010). Are worry, rumination, and post-event processing one and the same? Development of the repetitive thinking questionnaire. *Journal of Anxiety Disorders, 24*, 509–519. https://doi.org/10.1016/j.janxdis.2010.03.008

*McEvoy, P. M., Moulds, M. L., & Mahoney, A. E. J. (2013). Mechanisms driving pre- and post-stressor repetitive negative thinking: Metacognitions, cognitive avoidance, and thought control. *Journal of Behavior Therapy and Experimental Psychiatry, 44*(1), 84–93. https://doi.org/10.1016/j.jbtep.2012.07.011

Mrazek, D. A., Hornberger, J. C., Altar, C. A., & Degtiar, I. (2014). A review of the clinical, economic and societal burden of treatment-resistant depression: 1996–2013. *Psychiatric Services, 65*, 977–987. https://doi.org/10.1176/appi.ps.201300059

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Preita earthquake. *Journal of Personality and Social Psychology, 61*, 115–121. https://doi.org/10.1037//0022-3514.61.1.115

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*, 400–424. https://doi.org/10.1111/j.1745-6924.2008.00088.x

*Nordahl, H., Ødegaard, I. H., Hjemdal, O., & Wells, A. (2019). A test of the goodness of fit of the generic metacognitive model of psychopathology symptoms. *BMC Psychiatry, 19*(1), 288. https://doi.org/10.1186/s12888-019-2266-5

*Ophir, Y., & Mor, N. (2014). If I only knew why: The relationship between brooding, beliefs about rumination, and perceptions of treatments. *Behavior Therapy, 45*(4), 553–563. https://doi.org/10.1016/j.beth.2014.03.004

*Palmieri, S., Mansueto, G., Scaini, S., Fiore, F., Sassaroli, S., Ruggiero, G. M., Borlimi, R., & Carducci, B. J. (2018). Role of rumination in the relationship between metacognition and shyness. *World Journal of Psychiatry, 8*(4), 108–113. https://doi.org/10.5498/wjp.v8.i4.108

Papageorgiou, C., & Wells, A. (2001a). Metacognitive beliefs about rumination in recurrent major depression. *Cognitive and Behavioral Practice, 8*(2), 160–164. https://doi.org/10.1016/S1077-7229(01)80021-3

*Papageorgiou, C., & Wells, A. (2001b). Positive beliefs about depressive rumination: Development and preliminary validation of a self-report scale. *Behavior Therapy, 32*(1), 13–26. https://doi.org/10.1016/S0005-7894(01)80041-1.

*Papageorgiou, C., & Wells, A. (2003). An empirical test of a clinical metacognitive model of rumination and depression. *Cognitive Therapy and Research, 27,* 261–273. https://doi.org/10.1023/A:1023962332399.

Papageorgiou, C., & Wells, A. (2004). *Depressive rumination: Nature, theory and treatment*. Wiley.

*Papageorgiou, C., & Wells, A. (2009). A prospective test of the clinical metacognitive model of rumination and depression. *International Journal of Cognitive Therapy, 2*(2), 123–131. https://doi.org/10.1521/ijct.2009.2.2.123

Raes, F., Hermans, D., Williams, J. M. G., Bijttebier, P., & Eelen, P. (2008). A "triple W"-model of rumination on sadness: Why am I feeling sad, what's the meaning of my sadness, and wish I could stop thinking about my sadness (but I can't!). *Cognitive Therapy and Research, 32*, 526–541. https://doi.org/10.1007/s10608-007-9137-y

*Razavizadeh Tabadkan, B. B. Z., & Mohammadi Poor, M. (2016). Relationship between meta-cognitive beliefs and mindfulness with ruminative thoughts in students. *International Journal of Mental Health and Addiction, 14*(6), 1052–1056. https://doi.org/10.1007/s11469-016-9688-9

*Roelofs, J., Huibers, M., Peeters, F., Arntz, A., & van Os, J. (2010). Positive and negative beliefs about depressive rumination: A psychometric evaluation of two self-report scales and a test of a clinical metacognitive model of rumination and depression. *Cognitive Therapy and Research*, *34*(2), 196–205. https://doi.org/10.1007/s10608-009-9244-z

*Roelofs, J., Papageorgiou, C., Gerber, R. D., Huibers, M., Peeters, F., & Arntz, A. (2007). On the links between self-discrepancies, rumination, metacognitions, and symptoms of depression in undergraduates. *Behaviour Research and Therapy, 45,* 1295–1305. https://doi.org/10.1016/j.brat.2006.10.005.

*Ruiz, F. J., & Odriozola-González, P. (2015). Comparing cognitive, metacognitive, and acceptance and commitment therapy models of depression: A longitudinal study survey. *The Spanish Journal of Psychology, 18,* E39. https://doi.org/10.1017/sjp.2015.31.

Rush, A. J., Gullion, C. M., Basco, M. R., Jarrett, R. B., & Trivedi, M. H. (1996). The inventory of depressive symptomatology (IDS): Psychometric properties. *Psychological Medicine, 26*(3), 477–486. https://doi.org/10.1017/S0033291700035558

Rush, A. J., Trivedi, H., Ibrahim, H., Carmody, T. J., Arnow, B., Klein, D. N., Markowitz, J. C., Ninan, P. T., Kornstein, S., Manber, R.,

Thase, M. E., Kocsis, J. H., & Keller, M. B. (2003). The 16-item Quick Inventory of Depressive Symptomatology (QIDS), Clinician Ratings (QIDS-R), and Self-Report (QIDS-DR): A psychometric evaluation in patients with chronic major depression. *Biological Psychiatry, 54*, 573–583. https://doi.org/10.1016/S0006-3223(02)01866-8

*Sarisoy, G., Pazvantoğlu, O., Özturan, D. D., Ay, N. D., Yilman, T., Mor, S., Korkmaz, I. Z., Kaçar, Ö. F., & Gümüş, K. (2013). Metacognitive beliefs in unipolar and bipolar depression: A comparative study. *Nordic Journal of Psychiatry, 68*(4), 275–281. https://doi.org/10.3109/08039488.2013.814710.

*Solem, S., Hagen, R., Hoksnes, J. J., & Hjemdal, O. (2016). The metacognitive model of depression: An empirical test in a large Norwegian sample. *Psychiatry Research, 242,* 171–173. https://doi.org/10.1016/j.psychres.2016.05.056.

*Solem, S., Hagen, R., Wang, C. E. A., Hjemdal, O., Waterloo, K., Eisemann, M., & Halvorsen, M. (2015a). Metacognitions and mindful attention awareness in depression: A comparison of currently depressed, previously depressed and never depressed individuals. *Clinical Psychology & Psychotherapy, 24*(1), 94–102. https://doi.org/10.1002/cpp.1983

*Solem, S., Thunes, S. S., Hjemdal, O., Hagen, R., & Wells, A. (2015b). A metacognitive perspective on mindfulness: An empirical investigation. *BMC Psychology, 3*(1), 24. https://doi.org/10.1186/s40359-015-0081-4.

*Spada, M. M., Hiou, K., & Nikcevic, A. V. (2006). Metacognitions, emotions, and procrastination. *Journal of Cognitive Psychotherapy, 20*(3), 319–326. https://doi.org/10.1891/jcop.20.3.319.

*Spada, M. M., Langston, B., Nikčević, A. V., & Moneta, G. B. (2008a). The role of metacognitions in problematic Internet use. *Computers in Human Behavior, 24*(5), 2325–2335. https://doi.org/10.1016/j.chb.2007.12.002.

*Spada, M. M., Nikčević, A. V., Moneta, G. B., & Wells, A. (2008b). Metacognition, perceived stress, and negative emotion. *Personality and Individual Differences, 44*(5), 1172–1181. https://doi.org/10.1016/j.paid.2007.11.010.

*Spada, M. M., & Wells, A. (2005). Metacognitions, emotion and alcohol use. *Clinical Psychology & Psychotherapy, 12*(2), 150–155. https://doi.org/10.1002/cpp.431.

Spitzer, R. L., Kroenke, K., & Williams, J. B. (1999). Validation and utility of a self-report version of PRIME-MD: The PHQ primary care study. Prime Care Evaluation of Mental Disorders. Patient Health Questionnaire. *JAMA, 282*(18), 1737–1744. https://doi.org/10.1001/jama.282.18.1737

Sun, X., Zhu, C., & So, S. H. W. (2017). Dysfunctional metacognition across psychopathologies: A meta-analytic review. *European Psychiatry, 45*, 139–153. https://doi.org/10.1016/j.eurpsy.2017.05.029

*Tan, S., Moulding, R., Nedeljkovic, M., & Kyrios, M. (2010). Metacognitive, cognitive and developmental predictors of generalised anxiety disorder symptoms. *Clinical Psychologist, 14*(3), 84–89. https://doi.org/10.1080/13284207.2010.521521.

Thomas, L., Kessler, D., Campbell, J., Morrison, J., Peters, T. J., Williams, C., Lewis, C., & Wiles, N. (2013). Prevalence of treatment-resistant depression in primary care: Cross-sectional data. *British Journal of General Practice, 63*(617), E852–E858. https://doi.org/10.3399/bjgp13X675430

Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy Research, 27*, 247–259. https://doi.org/10.1023/a:1023910315561

Trivedi, M. H., Rush, A. J., Ibrahim, H. M., Carmody, T. J., Biggs, M. M., Suppes, T., Crismon, M. L., Shores-Wilson, K., Toprac, M. G., Dennehy, E. B., & Witte, B. (2004). The inventory of depressive symptomatology clinician rating (IDS-C) and self-report (IDS-SR), and the quick inventory of depressive symptomatology, clinical rating (QIDS-C) and self-report (QIDS-SR) in public sector patients with mood disorders.: A psychometric evaluation. *Psychological Medicine*, *34*, 73–82. https://doi.org/10.1017/S0033291703001107.

*Vassilopoulos, S. P., Brouzos, A., & Moberly, N. J. (2015). The relationships between metacognition, anticipatory processing, and social anxiety. *Behaviour Change, 32*(2), 114–126. https://doi.org/10.1017/bec.2015.4.

Viechtbauer, W. (2010). Conducting Meta-Analyses in *R* with the *metafor* Package. *Journal of Statistical Software, 36*, 1–48.

*Watkins, E., & Moulds, M. (2005). Positive beliefs about rumination in depression—a replication and extension. *Personality and Individual Differences, 39*(1), 73–82. https://doi.org/10.1016/j.paid.2004.12.006.

Watkins, E., & Roberts, H. (2020). Reflecting on rumination: Consequences, causes, mechanisms and treatment of rumination. *Behaviour Research and Therapy, 127*, 1–28. https://doi.org/10.1016/j.brat.2020.103573

*Weber, F. & Exner, C. (2013). Metacognitive beliefs and rumination: A longitudinal study. *Cognitive Therapy and Research*, *37*(6), 1257–1261. https://doi.org/10.1007/s10608-013-9555-y

Wells, A. (2009). *Metacognitive therapy for anxiety and depression*. Guilford Press.

Wells, A. (2019). Breaking the cybernetic code: Understanding and treating the human metacognitive control system to enhance mental health. *Frontiers in Psychology, 10*, 2621. https://doi.org/10.3389/fpsyg.2019.02621

Wells, A., & Cartwright-Hatton, S. (2004). A short form of the metacognitions questionnaire: Properties of the MCQ-30. *Behaviour Research and Therapy, 42*, 385–396. https://doi.org/10.1016/S0005-7967(03)00145-5

Wells, A., Fisher, P., Myers, S., Wheatley, J., Patel, T., & Brewin, C. R. (2009). Metacognitive therapy in recurrent and persistent depression: A multiple-baseline study of a new treatment. *Cognitive Therapy and Research, 33*(3), 291–300. https://doi.org/10.1007/s10608-007-9178-2

Wells, A., & Matthews, G. (1994). *Attention and emotion: A clinical perspective*. Lawrence Erlbaum Associates.

Wells, A., & Matthews, G. (1996). Modelling cognition in emotional disorder: The S-REF model. *Behaviour Research and Therapy, 34*, 881–888. https://doi.org/10.1016/S0005-7967(96)00050-2

Winter, L., Gottschalk, J., Nielsen, J., Wells, A., Schweiger, U., & Kahl, K. (2019). A comparison of metacognitive therapy in current versus persistent depressive disorder: A pilot outpatient study. *Frontiers in Psychology, 10*, 1714. https://doi.org/10.3389/fpsyg.2019.01714

*Yilmaz, A. E. (2016). Examination of the metacognitive model of depression in a Turkish university student sample. *Turkish Journal of Psychiatry, 27*(2), 1–9. https://doi.org/10.5080/u13505

*Yılmaz, A. E., Gençöz, T., & Wells, A. (2008). Psychometric characteristics of the Penn State Worry Questionnaire and Metacognitions Questionnaire-30 and metacognitive predictors of worry and obsessive-compulsive symptoms in a Turkish sample. *Clinical Psychology & Psychotherapy, 15*(6), 424–439. https://doi.org/10.1002/cpp.589.

Yılmaz, A. E., Gençöz, T., & Wells, A. (2011). The temporal precedence of metacognition in the development of anxiety and depression symptoms in the context of life-stress: A prospective study. *Journal of Anxiety Disorders, 25*(3), 389–396. https://doi.org/10.1016/j.janxdis.2010.11.001

*Yilmaz, A. E., Gençöz, T., & Wells, A. (2015). Unique contributions of metacognition and cognition to depressive symptoms. *The Journal of General Psychology, 142*(1), 23–33. https://doi.org/10.1080/00221309.2014.964658.

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica, 67*, 361–370. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x

Zimmerman, M., Coryell, W., Corenthal, C., & Wilson, S. (1986). A self-report scale to diagnose major depressive disorder. *Archives of General Psychiatry, 43*, 1076–1081. https://doi.org/10.1001/archpsyc.1986.01800110062008