

Examination of the Metacognitive Model of Depression in a Turkish University Student Sample



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SUMMARY

Aim: The aim of the present study is to test the metacognitive model of depression in a Turkish sample using structural equation modeling.

Method: A total of 305 university students participated in this study. The data concerning the levels of rumination, positive beliefs about rumination (positive beliefs), negative beliefs about uncontrollability and harm of rumination (negative beliefs-1), negative beliefs about interpersonal and social consequences of rumination (negative beliefs-2), lack of cognitive confidence, and depression was collected using a web-survey method.

Results: The results indicated a number of necessary modifications that are needed in order to obtain a good fitting model for the data. The implementation of these theoretically consistent modifications resulted in a good fitting modified model. Accordingly, positive beliefs predicted depressive symptoms by means of rumination, negative beliefs-1, and negative beliefs-2. Negative beliefs-1 and negative beliefs-2 partially mediated the relationship between rumination and depression as well. In addition, the whole process with regard to the elucidation of depressive symptomatology significantly explained the change in the level of cognitive confidence.

Conclusion: Overall, the findings obtained from the present study support the validity of the basic components of the metacognitive model of depression in a Turkish sample.

Keywords: Depression, Rumination, Cognition, Structural Equation Modeling

INTRODUCTION

In understanding and treating psychological disorders, cognitive approaches focus predominantly on the “content” of thoughts rather than cognitive processes. Recently, this tendency has started to be considered an incomplete evaluation of cognition (Papageorgiou & Wells 1999). As a result, the importance of metacognitions, which refer to the information processing system that monitors, interprets, controls, and regulates a person’s own thoughts, has begun to be emphasized (Fisher & Wells 2009, Wells 2000, 2009, Wells & Purdon 1999). In other words, the incomplete part of the cognitive picture that may be relevant to understanding psychopathology might very well be the metacognitive factors

that include beliefs or appraisals about thinking and strategies used to monitor and control thoughts, and thus direct cognitive activities and determine cognitive content (Wells & Cartwright-Hatton 2004). Accordingly, a metacognitive approach that focuses on understanding and modifying thought processes rather than the content of thoughts offers important opportunities for the enrichment of the current theoretical accounts of psychological disorders (Papageorgiou & Wells 1999, Wells & Purdon 1999).

According to the metacognitive theory of psychological disorders (Wells 2000, 2009) which is based on the Self-Regulatory Executive Functions Model (Wells & Matthews 1994), a specific pattern of cognition, which is referred to as Cognitive Attentional Syndrome (CAS), is responsible for converting

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relatively common negative emotions and thoughts, that can be accepted as normal, into an abnormal pattern. Wells and Matthews claim that the CAS is characterized by intensified, self-focused attention in the form of perseverative thinking styles of worry or rumination, diminished cognitive functioning, sustained attention allocation to internal or external sources of threat, and the use of maladaptive coping strategies such as thought suppression and avoidance. The aforementioned syndrome is caused by the activation of positive and negative metacognitive beliefs. Positive metacognitions include beliefs about the advantages of using rumination, worry, attentional bias, and dysfunctional coping strategies. Negative metacognitive beliefs appear subsequent to positive ones and focus on the disadvantages of the processes activated by positive beliefs.

Based on this generic theoretical framework involving all psychological disorders, Papageorgiou and Wells (2003, 2004) developed a structural model of depression. According to this model (Figure 1), which explains maintenance and exacerbation mechanisms rather than the onset mechanisms of depressive symptomatology, when a personal trigger is perceived (e.g., a negative feeling or image, a negative experience such as a loss or failure, a depressive symptom) *positive beliefs*, including ruminating about the meaning and causes of this trigger, are a useful coping strategy for overcoming the actively experienced negative situation (e.g., “ruminating about my depression helps me to understand past mistakes and failures”). In other words, positive metacognitive beliefs may cause using *rumination* to become a metacognitive coping strategy. However, as the ruminative thinking style does not create the desired positive effects, the ruminations will persist. This increase in rumination results in the emergence of negative beliefs that include both the uncontrollability and danger of rumination (*negative beliefs-1*, e.g., “ruminating will turn me into a failure”, “it is impossible not to ruminate about the bad things that have happened in the past”) and the negative interpersonal and social consequences of rumination (*negative*

beliefs-2, e.g., “people will reject me if I ruminate”). Hereby, the increase in the level of depressive symptoms is dependent upon the development of these negative metacognitive beliefs. As a byproduct of depressive symptomatology, lower levels of cognitive confidence (*lack of cognitive confidence*, see method section for the explanation of using this label for this concept rather than using *metacognitive efficiency*, as in the original model) contribute to negative beliefs about interpersonal and social consequences of rumination (negative beliefs-2) while also providing a basis for the maintenance of positive beliefs about rumination in order to facilitate effective coping (Figure 1).

Studies providing empirical evidence about the association between metacognitive beliefs and depression are steadily accumulating. In Papageorgiou and Wells’ studies (2001a, 2003), which were conducted on non-clinical samples, positive beliefs about rumination were found to be significantly and positively correlated with rumination and severity of depression. This result was also confirmed in depression patients (Papageorgiou & Wells 2003, Watkins & Moulds 2005). Similarly, negative beliefs about rumination were also found to be positively associated with rumination and severity of depression in both non-clinical and clinical samples (Papageorgiou & Wells 2003). In a limited number of longitudinal studies conducted on non-clinical samples, both negative beliefs about rumination (Papageorgiou & Wells 2009) and the indirect effect of positive beliefs about rumination via rumination (Weber & Exner 2013) were reported as significant predictors of depressive symptomatology. In Kubiak and colleagues’ study (2014), positive beliefs about rumination were significantly associated with the occurrence of rumination in daily life. The relationship between positive beliefs and negative mood was also mediated by the level of daily rumination. In addition, studies with samples from different cultures, such as Poland and Iran, supported the positive relationship between lack of cognitive confidence and depressive symptomatology (e.g., Gaweda & Kokoszka 2014, Papageorgiou & Wells 2003, Saedet al. 2010, Yilmaz et al. 2011).

The metacognitive model of depression has been examined in both clinical and non-clinical samples via structural equation analyses. The first study, which was conducted by Papageorgiou and Wells (2003), included two different samples including depressed and non-depressed participants. While the same pattern was observed between the groups in rumination tendency caused by positive metacognitive beliefs, the relationship patterns involving negative beliefs were found to be different. Accordingly, both types of negative beliefs mediated the relationship between rumination and depression in the depressed group. In the non-depressed group, metacognitive beliefs about interpersonal and social consequences of rumination (negative beliefs-2) were the only factor that partially mediated the relationship between rumination and

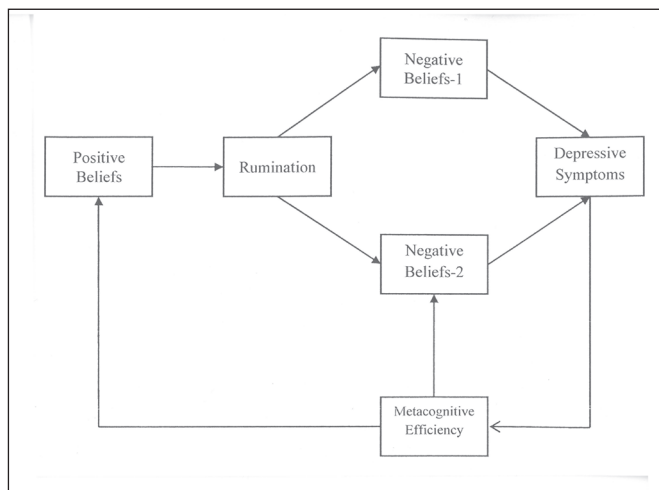


Figure 1. Metacognitive Model of Depression, Papageorgiou and Wells (2003)

depression. The level of rumination was also found to directly contribute to depressive symptomatology. When the models, having been verified by the data, were examined in terms of cognitive confidence (i.e., metacognitive efficiency), the relationship pattern between positive and negative beliefs about rumination were in the opposite direction than what was initially predicted for both samples. That is, the variable contributing to metacognitions about rumination was not the cognitive confidence as expected, but rather metacognitions about rumination contributed to lower levels of cognitive confidence. In addition, while cognitive confidence was observed as a byproduct of depressive symptomatology in the depressive sample, the suggested relationship between these two variables was not found in the non-depressive student sample group.

In another study using structural equation analysis, the metacognitive model of depression was tested in a non-clinical Dutch sample after excluding the cognitive confidence component from the model (Roelofs et al. 2007). The results indicated that positive beliefs lead to an increase in ruminations. As a result, beliefs about uncontrollability and danger of rumination (negative beliefs-1) were associated with depressive symptoms. The significance of the relationship between negative beliefs regarding social consequences of rumination (negative beliefs-2) and depressive symptoms was not confirmed. However, a direct effect of rumination on depression was observed, and furthermore the establishment of a connection between the error terms of negative beliefs-1 and negative beliefs-2 became necessary in this model. Roelofs et al. (2010) also tested the model as a whole, including cognitive confidence in depression cases. The results indicated a series of modifications needed so that the model fits the data well. In the modified model, establishing bi-directional connections between rumination and negative metacognitive beliefs, drawing a direct connection between rumination and depressive symptoms, and associating the error terms of both types of negative metacognitive beliefs have become necessary. The removal of the theoretically suggested links between negative beliefs about uncontrollability and danger of rumination (negative beliefs-1) and depressive symptoms as well as between lack of cognitive confidence and positive and negative metacognitive beliefs have also become necessary.

In Turkey, the number of studies focusing on the association between metacognitions and depressive symptoms is very limited. The study investigating psychometric properties of the Turkish versions of the metacognition scales about rumination in the clinical and non-clinical samples (Yılmaz et al. in press) revealed that both positive and negative beliefs about rumination positively correlated with depressive symptoms in the non-clinical group, while negative beliefs about rumination were the only factor significantly and positively correlated with depressive symptoms in the clinical depression group. In a longitudinal study conducted on university students

(Yılmaz et al. 2011), although negative metacognitive beliefs about worry predicted the change in depressive symptoms within a six-month interval, metacognitive beliefs specific to depression were not included in this study. Depending on the worry pattern observed in a depressive state, Sarısoy and colleagues (2014) compared major depressive disorder, bipolar disorder, and healthy control groups in terms of metacognitive beliefs about worry. The results showed that the levels of negative beliefs about worry and need to control thoughts were significantly higher in unipolar and bipolar groups than controls. The results also showed that the level of lack of cognitive confidence was significantly higher in the bipolar group than the control group. In Ak and colleagues' study (2013) comparing suicidal and non-suicidal major depression cases regarding metacognitions, the levels of cognitive confidence and need to control thoughts were found to be significantly higher in the suicidal group than non-suicidal group.

In line with this literature, it can be claimed that there is still room for additional studies in various samples and cultures to test the metacognitive model of depression, which is relatively novel in comparison to the cognitive model of depression. The number of international studies is also limited, furthermore this model has not yet been tested in Turkey. In other words, when available literature is reviewed, no previous research in Turkey has been found investigating the metacognitive model of depression in either clinical or non-clinical samples. Although the metacognitive model of depression has been constructed with the purpose of understanding the development of clinical depression, the researchers have tested the model in non-clinical samples as well. It is known that investigations among non-clinical samples, which can be accepted as analog clinical samples because of the subthreshold symptoms, provide support for the validity of psychopathology models. Therefore, the main aim of the present study is to test the metacognitive model of depression depicted in Figure 1 in a Turkish university sample via structural equation modeling.

METHOD

Participants

The sample of the study consisted of participants taking part in the first stage of a longitudinal TÜBİTAK Project. A total of 305 undergraduate students, composed of 167 female (54.8%) and 138 male (45.2%) from Dokuz Eylül University, participated in the study. The mean age of the sample is 22.4 (SD = 2.6, range 18-29).

Instruments

Beck Depression Inventory (BDI, Beck et al. 1979): BDI is a 21-item inventory devised for assessing the level of depressive symptomatology. The score for each item varies between 0

and 3, and the total score is between 0 and 63. Higher scores indicate an increase in the level of depressive symptoms. The Turkish adaptation study of the inventory was conducted by Hisli (1988, 1989), and it was shown that the psychometric properties of the Turkish version were satisfactory.

Ruminative Responses Scale, Short Form (RRS-SF, Treynor et al. 2003): The 10-item RRS-SF was constructed by removing the items that had been criticized for overlapping with depressive symptoms in the 21-item long version of the scale assessing the level of ruminative thinking (Nolen-Hoeksema & Morrow 1991). Items are in the question format such as 'Think "What am I doing to deserve this?"' and scored on a 4-point Likert-type scale ranging between (1) *almost never* and (4) *almost always*. The original RRS-SF was found to be strongly correlated ($r = 0.90$) with the long version of the scale, and the internal consistency coefficient of the scale was high (Cronbach $\alpha = 0.85$). The RRS-SF was adapted into Turkish by Erdur-Baker and Bugay (2012) and the Turkish version of the scale has good reliability (Cronbach $\alpha = 0.85$) and validity (with BDI, $r = 0.60$).

Positive Beliefs about Rumination Scale (PBRs, Papageorgiou & Wells 2001a): PBRs is a 9-item measure that assesses positive metacognitive beliefs focused on the benefits of the ruminative thinking style (e.g., "Ruminating about the past helps me to prevent future mistakes and failures"). Participants evaluate to what extent they agree with each item using a 4-point Likert scale ranging between (1) *Do not agree* and (4) *Agree very much*. Total scores that can be obtained from the scale range between 9 and 36 with higher scores indicating the strongest positive metacognitive beliefs about rumination. Internal consistency and test-retest reliability coefficients were reported as 0.89 and 0.85, respectively. The positive correlation ($r = 0.43$) between positive beliefs about rumination and positive beliefs about worry refers to the concurrent validity of the scale. The positive correlations between PBRs and rumination ($r = 0.53$), and PBRs and depressive symptoms ($r = 0.45$) indicate the convergent validity of the scale (Papageorgiou & Wells 2001a).

Yılmaz and colleagues (in press) examined the psychometric properties of the Turkish PBRs in clinical and non-clinical samples. Reliability analyses in the non-clinical sample revealed a Cronbach's Alpha coefficient of 0.92 and test-retest reliability coefficient of 0.70. The significant and positive correlations between PBRs and depressive symptoms ($r = 0.26$), and PBRs and rumination level ($r = 0.42$) indicated convergent validity of the Turkish scale. Supporting the criterion-related validity of the scale, it was reported that individuals with higher levels of depressive symptoms had stronger positive beliefs about rumination than those with lower levels of depressive symptoms. In summation, psychometric analyses demonstrate that the Turkish PBRs can be used as a reliable and valid instrument (Yılmaz et al. in press).

Negative Beliefs about Rumination Scale (NBRS, Papageorgiou & Wells 2001b): NBRS is a 13-item scale evaluating negative beliefs about the disadvantages of ruminative thinking. It is composed of two sub-dimensions: One of the dimensions consists of eight items assessing metacognitive beliefs about the uncontrollability and danger of ruminations (NBRS1, e.g., "When I ruminate I can't do anything else", "Ruminating makes me physically ill"); the second is a 5-item scale examining metacognitive beliefs concerning the negative interpersonal and social consequences of rumination (NBRS2, e.g., "People will reject me if I ruminate"). Participants evaluate to what extent they agree on each item using a 4-point Likert scale ranging between (1) *Do not agree* and (4) *Agree very much*. The total scores range from 13 to 52 with higher scores indicating an increase in the level of negative beliefs about rumination. The NBRS1's and NBRS2's coefficients for internal consistency were reported as 0.80 and 0.83, respectively. The coefficients for test-retest reliability were reported as 0.66 and 0.68, respectively (Luminet 2004). Furthermore, both subscales were significantly correlated with rumination ($r = 0.51$ and 0.39 , respectively) and depression symptoms ($r = 0.46$ and 0.35 , respectively), supporting the convergent validity of the scale.

In the Turkish adaptation study of the NBRS (Yılmaz et al. in press), the construct validity of the scale was examined using exploratory factor analysis. It was concluded that the Turkish version of the scale was also composed of two factors of NBRS1 and NBRS2 as in the original scale. The reliability analyses conducted on the non-clinical sample demonstrated that the Cronbach's Alpha coefficients of the scale were 0.83, 0.78, and 0.74 while the test-retest coefficients were 0.73, 0.61, and 0.74 for the total scores, NBRS1, and NBRS2, respectively. The significant and positive correlations of NBRS with depressive symptoms ($r = 0.59$) and rumination ($r = 0.50$) indicate convergent validity of the scale. The criterion-related validity examinations revealed that NBRS was able to discriminate individuals with high levels of depressive symptoms from those with low symptom levels. In general, the results of psychometric analyses support that the Turkish version of the NBRS is a reliable and valid instrument (Yılmaz et al. in press).

Metacognitions Questionnaire-30 (MCQ-30), Lack of Cognitive Confidence Subscale, Wells & Cartwright-Hatton 2004): The MCQ-30 is designed to assess positive and negative metacognitive beliefs related to worry and a range of metacognitive thought processes such as lack of cognitive confidence, need to control thoughts, and cognitive consciousness. The MCQ-30 is also a 4-point Likert-type scale (1 = *Do not Agree*, 4 = *Agree very much*) composed of 30 items. In this research, even though participants filled in the entire questionnaire, only the lack of cognitive confidence (LCC) subscale was used in the analyses, since it is the only subscale the tested model requires.

Higher scores obtained from the 6-item LCC subscale indicate higher levels of lack of cognitive confidence in memory with regard to words, names, actions, and places.

The adaptation study of converting the scale into Turkish was conducted by Yılmaz and colleagues (2008). In accordance with the original version, the Turkish version of the MCQ-30 comprises a five-factor structure. The Cronbach's Alpha coefficients were 0.87 for the whole scale and 0.89 for the LCC subscale. The split-half reliability was reported as 0.90 for both the total scale and the LCC subscale. The statistically significant and positive correlations of the LCC subscale with pathological worry ($r = 0.30$), trait anxiety ($r = 0.34$), anxiety symptoms ($r = 0.17$) and depression symptoms ($r = 0.23$) supported the convergent validity of the scale. Research investigating psychometric properties of the Turkish version of MCQ-30 indicated that the questionnaire, including all of its subscales, is a reliable and valid assessment (Yılmaz et al. 2008).

This subscale is named "metacognitive efficiency" in the 65-item long version of the Meta-Cognitions Questionnaire (MCQ, Cartwright-Hatton & Wells 1997), as used in Papageorgiou and Wells' (2003) development and testing of the metacognitive model of depression study. However, the same subscale is named "cognitive confidence" in the 30-item short version of the MCQ. Since labeling this subscale, which consists of negative items focusing on lack of confidence in memory, with the name of cognitive confidence and stating that an increase in cognitive confidence is positively correlated to psychological symptoms would cause confusions/misunderstandings, this subscale was translated into Turkish as "lack of cognitive confidence" (Yılmaz et al. 2008).

Procedure

Upon obtaining ethical approval from Dokuz Eylül University Ethical Committee, the questionnaires were loaded on a webpage that is prepared for the study, and the participants filled in the instruments online. A specific programming (recording the time and date of administration for each instrument as well as not accepting submissions if there is missing values) for the questionnaire link was used in order to control whether the instruments were filled in randomly or incompletely. In addition, participants were able to monitor how many questionnaires were left in order to complete their participation. The participants were also able to see the response options as they scrolled down on the screen so that the quality and feasibility of the answering procedure would increase. Participants were asked via the university mailing list whether they would like to be included in the present study or not. If they agreed, they used a link where they could find an information sheet about the study as well as an informed consent form. Participants were able to start to fill in questionnaires under the condition that they provide a valid e-mail address substituting their

informed consent signature and enter the specific code sent to their address in the system. An e-mail address was valid to participate only one time, but participants with the same address and code were able to enter the link as many times as they need until all the questionnaires are completed. The instruments were presented in a randomized order using a specific programming for the questionnaire link to eliminate the effect of sequencing.

Statistical Analyses

Before testing the model, the mean values and standard deviations of the variables and inter-correlations among them were calculated via SPSS 20.0. The mean differences between women and men in terms of the study variables were also examined using one-way ANOVA. The metacognitive model of depression depicted in Figure 1 was tested through path analysis with observed variables (Kline 2005) using AMOS 20.0. In order to improve the fit of the model to the data, the modification indices provided by AMOS were considered. The significance of indirect effects in the model was tested through the bootstrapping method (along with 95% confidence intervals [CI] using at least 5000 bootstrapping re-samples) which is suggested rather than the Sobel test that usually violates the normality assumption (Preacher & Hayes 2004, 2008).

RESULTS

Correlational Analysis and Descriptive Statistics

The mean values and standard deviations of the variables and inter-correlations among them were presented in Table 1. The patterns of relationships indicated significant and positive correlations among all variables, except for the correlation between positive beliefs about rumination and lack of cognitive confidence. On the other hand, it is worth attention that negative beliefs about rumination displayed a stronger relationship with depressive symptoms in comparison to positive beliefs including the advantages of rumination as a coping strategy. One-way ANOVA results revealed no significant differences between women and men in terms of any study variables (i.e., rumination, positive beliefs, negative beliefs, lack of cognitive confidence, and depression).

Model Testing

In the first analysis, the hypothesized model (Figure 1) did not fit to the data, revealing goodness of fit indices as $\chi^2 (7, N = 305) = 149.64, p < 0.001, \chi^2 / df = 21.4, GFI = 0.87, AGFI = 0.60, TLI = 0.43, CFI = 0.73, \text{ and } RMSEA = 0.26$. The modification indices indicated improvements to the fit of the model to the data by allowing for the association of error variances between negative beliefs-1 and negative beliefs-2, and adding a path between rumination and depressive

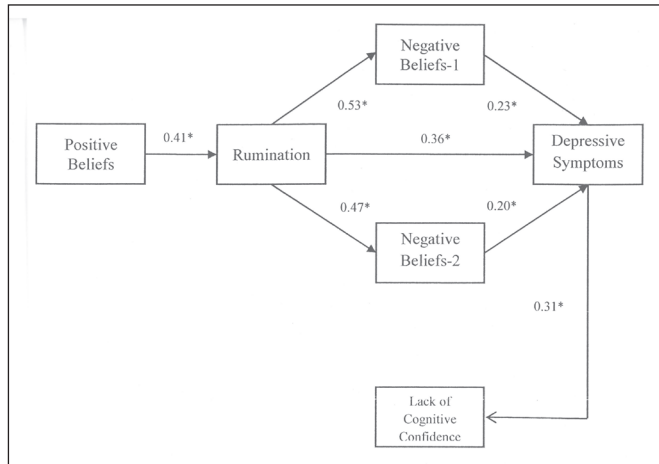


Figure 2. Final Metacognitive Model of Depression Verified by Data
* $p < 0.001$

depressive symptoms was a significant predictor of the change in lack of cognitive confidence ($\beta = 0.31$, $p < 0.001$).

The significance of indirect effects in the model was tested though the bootstrapping method. Accordingly, the indirect effects of positive beliefs on negative beliefs-1 ($\beta = 0.22$, Standard Error (SE) = 0.03, $p < 0.001$, 95% CI = 0.16-0.28), on negative beliefs-2 ($\beta = 0.19$, SE = 0.03, $p < 0.001$, 95% CI = 0.13-0.25), and on depressive symptoms ($\beta = 0.24$, SE = 0.03, $p < 0.001$, 95% CI = 0.17-0.30) were significant. Furthermore, the indirect effect of rumination on depressive symptoms ($\beta = 0.22$, SD = 0.03, $p < 0.001$, 95% CI = 0.15-0.29) was also significant. Lastly, all of the indirect paths from positive beliefs to lack of cognitive confidence were also statistically significant (for positive beliefs-lack of cognitive confidence $\beta = 0.07$, $p < 0.001$, for rumination- lack of cognitive

Tablo 1. Inter-correlations among study variables, means and standard deviations (N = 305)

Variables	Mean	SD	1	2	3	4	5	6
1. Rumination	23.31	6.63	-					
2. Positive Beliefs	23.05	6.68	.41*	-				
3. Negative Beliefs-1	13.95	4.66	.54*	.32*	-			
4. Negative Beliefs-2	12.21	4.28	.47*	.25*	.64*	-		
5. Lack of Cognitive Confidence	11.82	5.07	.18*	.01	.26*	.23*	-	
6. Depression	16.19	9.89	.58*	.27*	.55*	.52*	.31*	-

* $p < 0.001$

symptoms. Negative beliefs-1 and negative beliefs-2 about rumination are two subscales of the same instrument. Moreover, based on the relevant literature, a direct relationship between rumination and depression is expected. Thus, the analysis was repeated after the implementation of these theoretically consistent modifications. Although the modified model resulted in a model that fitted well to the data, it was determined that the hypothesized theoretical relationship of lack of cognitive confidence with positive beliefs and negative beliefs-2 was not significant. The analysis was repeated by removing these non-significant paths between the relevant variables and the final model (Figure 2) fitted to the data very well, revealing goodness of fit indices as $\chi^2 (7, N = 305) = 12.75$, $p = 0.08$, $\chi^2 / sd = 1.82$, GFI = 0.99, AGFI = 0.96, TLI = 0.98, CFI = 0.99, and RMSEA = 0.05.

As one can clearly deduce from the standardized regression coefficients illustrated in Figure 2, all direct relationships were significant and positive. In other words, positive beliefs predicted rumination ($\beta = 0.41$, $p < 0.001$), rumination predicted negative beliefs-1 and 2, ($\beta = 0.53$, $p < 0.001$ and $\beta = 0.47$, $p < 0.001$, respectively), and negative beliefs-1 and 2 predicted depressive symptoms ($\beta = 0.23$, $p < 0.001$ and $\beta = 0.20$, $p < 0.001$) significantly. Moreover, the level of

confidence $\beta = 0.18$, $p < 0.001$, for negative beliefs-1- lack of cognitive confidence $\beta = 0.07$, $p < 0.005$ and for negative beliefs-2- lack of cognitive confidence $\beta = 0.06$, $p < 0.01$).

To summarize the findings related to the mediation relationship between variables, the association between positive beliefs and depressive symptoms was mediated by rumination, negative beliefs-1, and negative beliefs-2. In addition, rumination predicted depressive symptoms partly by negative beliefs-1 and negative beliefs-2. The results also demonstrated that the rumination level significantly mediated the relationships between positive beliefs and negative beliefs-1 as well as between positive beliefs and negative beliefs-2. The combined observed variables directly and indirectly explained 44% of the variation in depressive symptomatology.

DISCUSSION

In this investigation, the aim was to examine the metacognitive model, which is a contemporary approach to depression using structural equation modeling in a Turkish university sample. The analysis revealed results supporting the validity of the main propositions of the relevant model in a Turkish sample as well. In particular, positive beliefs about rumination lead to the intensification of rumination tendency. The

intensified rumination level amplifies beliefs about negative consequences of rumination, and as a result, an increase in depressive symptoms takes place. In other words, although a ruminative thinking style, activated by the belief that rumination is a useful metacognitive strategy, has a direct effect on the exacerbation of depressive symptoms, negative metacognitive beliefs about rumination also play role in explaining the levels of increased depression in ruminative individuals. This process as a whole diminishes the level of confidence an individual holds for his/her cognitive functionality.

When the components of the confirmed final model are considered individually, the results obtained for positive metacognitive beliefs might be evaluated as supportive of the notion that treating rumination as a useful coping strategy plays a role in the maintenance process of depressive symptomatology. According to the model, the association of positive beliefs with depressive symptoms occurs by means of rumination tendency and negative beliefs about the effects of rumination. This finding is in line with those obtained both by the original testing model (Papageorgiou & Wells 2003) and cross-cultural studies carried out in different countries, such as Germany and Holland (e.g. Kubiak et al. 2014, Roelofs et al. 2007, 2010, Weber & Exner 2013). On the other hand, previous research conducted on different samples has produced inconsistent results. For example, while the association of positive beliefs with depressive symptoms was shown in university students, in the adaptation study of converting PBRS and NBRS into Turkish, no connection was observed between these two variables in the depression group. In this context, further research should be undertaken to test the metacognitive model of depression in Turkish groups with clinical depression.

The present findings obtained regarding the negative metacognitive beliefs about uncontrollability, danger, and social consequences of rumination indicated the need for the implementation of some modifications on the original model proposed by Papageorgiou and Wells (2003). In their preliminary study, researchers proposed that negative metacognitive appraisals mediate the relationship between rumination and depression. This emphasizes an indirect relationship between rumination and depression. However, the current study found that negative metacognitive beliefs partly mediate the relationship between rumination and depression, which in turn emphasizes both a direct and indirect relationship between rumination and depression. In fact, Papageorgiou and Wells' findings also indicated that adding a direct path between rumination and depression in the non-depressive group was a possibility. In addition, a full mediation was found only in their depressive sample. In the metacognitive model of depression, detailed later by Wells (2009), a direct path between rumination and depression symptoms was drawn, emphasizing that this direct effect contributes to the maintenance of

mood disturbances, especially in the early stages of depression. Besides, in the structural equation analyses performed in different cultures in order to test this model (Roelofs et al. 2007, 2010), the necessity of a direct path between rumination and depression was identified. With respect to the aforementioned findings, the result obtained from the present study might be evaluated as consistent with the data obtained in previous studies as well as with the modifications that the originators implemented in the model. In other words, it can be concluded that a partial mediation role of negative beliefs in the relationship between rumination and depression is theoretically more coherent with the described structural model. However, since the proposed mediation hypothesis emphasizing that the effect of rumination on depressive symptoms occur by means of negative beliefs about rumination would be a more prevailing view in a clinical depression group, further studies designed to evaluate this proposition in depression cases are required in Turkey.

In the original model (Papageorgiou & Wells 2003), lack of cognitive confidence (i.e., metacognitive efficiency), which is conceptualized as being caused by the metacognitive processes with regard to depression, is hypothesized as having a feedback loop to both negative beliefs about social consequences of rumination (negative beliefs-2) and positive beliefs about rumination. However, their results did not support the association between depressive symptoms and cognitive confidence, and a relationship between metacognitive beliefs about rumination and the level of cognitive confidence was found to opposite of what was hypothesized. In the modified model detailed by Wells (2009), it is remarkable that this variable has not been included as a component of the model. In another analysis performed with depression cases in a different culture, no connection was reported between cognitive confidence and metacognitive beliefs about rumination (Roelofs et al. 2010). Therefore, the present finding indicating no significant relationship between the level of cognitive confidence and positive and negative metacognitive beliefs seem to be in line with the previous findings in the literature.

Some findings in the current study fit to the hypothesized theoretical structure better than the findings of previous studies obtained from non-depressive samples. Accordingly, in Papageorgiou and Wells' study (2003) conducted on a student sample, beliefs about uncontrollability and danger of rumination (negative beliefs-1) did not significantly predict depressive symptoms. Similarly, in Roelofs and colleagues' examination (2007), negative social consequences of rumination (negative beliefs-2) were not found to be associated with depression. In the present study, however, both types of negative beliefs about rumination were shown to be directly related to depressive symptomatology. At this point, the only conclusion to be drawn from the current findings is that these components of the model operate as theoretically proposed in

the aforementioned Turkish university sample. As a general evaluation, it may be the case that all of the above mentioned consistent and inconsistent findings with the original study might be affected by various factors, such as cultural differences, psychometric properties of the instruments, and data collection procedures. For example, Papageorgiou and Wells (2003) assessed the lack of cognitive confidence (i.e., metacognitive efficiency) and rumination variables by using the longer initial versions of the relevant questionnaires administered in the present study, as well as a different instrument for assessing the level of depressive symptomatology. Thus, the findings obtained from the present study would only be significant if they are supported by many other studies.

Some limitations of the study should be addressed. First of all, this is only a cross-sectional test of the model in a non-clinical university sample. The metacognitive model of depression explains exacerbation of the symptoms to a clinical degree rather than emphasizing the onset of symptomatology. Thus, investigation of this model in clinical groups, and also in different analysis units using longitudinal designs, would provide valuable information. The significant indirect effects were also not examined in enough detail to understand the individual mediator variables. To illustrate, the individual mediation effects of rumination and negative beliefs on the indirect path from positive beliefs to depression were not differentiated. For this reason, more specific research hypotheses, focusing on the individual roles of these mediators, should be considered in future research. Also, specialized modelings that formalize the observed or latent cultural variables might be taken into account for the metacognitive explanation of depressive symptomatology in different cultures.

In conclusion, since Papageorgiou and Wells' (2003) preliminary study on the structural metacognitive model of depression, some modifications concerning this model have been implemented. Still, we might conclude that many findings in the relevant literature, including the present study, have consistently provided support not only for the main components of the model but also for the theoretical accounts of the Self-Regulatory Executive Functions model. The evidence suggesting the validity of the metacognitive model of depression in a non-clinical university sample from Turkey might be accepted as a preliminary step for considering metacognitive techniques in psychotherapy practices in order to obtain improvements in treatment outcome. Hereby, a new perspective to be implemented in practical and theoretical studies in the fields of clinical psychology and psychiatry has been tested. The preliminary findings obtained from the current study have indicated that identification and modification of dysfunctional beliefs about rumination in psychotherapeutic interventions would contribute to improvements in the efficiency of treatments. In addition, it might be concluded that the present study that tests this model in Turkey may

contribute to answering questions about the cross-cultural validity of the model.

Even though the cognitive model of depression (Beck 1976) is a well-known, empirically validated approach, depressive relapse seen in the treated cases continues to be an important problem (Gloaguenet al. 1998, Gortneret al. 1998, Teasdale et al. 1995). The main objective of classical cognitive therapy is to identify, evaluate, and modify the content of negative thoughts, beliefs, and dysfunctional schemata. The effectiveness of this intervention approach has been demonstrated by many individual studies (e.g., Rush et al. 1977) and meta-analysis studies (Gaffan et al. 1995, Stuart & Bowers 1995). On the other hand, it has also been proven that standard cognitive interventions are less effective on individuals having higher levels of rumination in comparison to those whose rumination level is low (Ciesla & Roberts 2002, Schmalinger et al. 2002). It may be the case that questioning the content of each thought that exists in a negative, repetitive, and recycling "chain of thoughts" manner, as seen in ruminative thinking, might not be as effective as questioning the content of ordinary, negative automatic thoughts in practice (Watkins 2009). On the contrary, metacognitive psychotherapy (Wells 2000, 2009) suggests techniques directed to the process of ruminative thinking and dysfunctional beliefs about rumination itself, rather than techniques of intervening in the content of ruminations. Focusing on the process of ruminative thinking makes metacognitive interventions more brief and effective in terms of relapse prevention. In light of all this, pursuing and expanding research activities relating to the metacognitive approach, especially in comparison to the cognitive approach, should be accepted as a crucial target for clinical psychology and psychiatry disciplines in order to complete the cognitive approach, increase the effectiveness of therapy, shorten the course of treatment, and decrease the possibility of relapse.

AUTHOR NOTE

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