

# The role of metacognitive beliefs in depression: Mediating role of rumination

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## Abstract

**Introduction:** The aim of the present study was to investigate the role of metacognitive beliefs in depression by the mediating role of rumination.

**Methods:** The present study was conducted with a correlational method. Therefore, 275 students of the University of Tabriz were selected using a stratified sampling method. Beck's depression inventory, Wells' metacognitive questionnaire and Treynor's rumination questionnaire were used for data collection. Data were analyzed by path analysis using the LISREL Software.

**Results:** The results of the present study indicated that there was a positive relationship between positive and negative beliefs of worry and rumination schemas. Besides, there was a positive relationship between these beliefs and depression. Regarding to the fitness Indexes, the mediating role of rumination in the relation between positive and negative metacognitive beliefs and depression was confirmed.

**Conclusion:** Based on the findings of the present study, it can be proposed that depression could be influenced by dysfunctional metacognitive beliefs (positive and negative beliefs about worry) through different paths. Such effects are intensified by dysfunctional schemas such as rumination. Hence, positive metacognitive beliefs are considered as a trigger for the application of rumination as an incompatible coping style for depression.

**Key words:** Metacognitive Beliefs, Rumination, Depression

## Introduction

Depression is a disorder that is determined by 5 symptoms such as depressed mood, lack of interest, weight gain or loss, insomnia or oversleeping, mobility or psychomotor retardation, tiredness, feeling of worthlessness or guilt, decreased ability of concentration, recurrent thoughts of death, which continue for at least 2 weeks [1]. In recent studies, major depressive disorder has been identified as the most common psychiatric disorder during lifespan (about 17%) [2]. On the other hand, about 60% of patients who received diagnostic criteria of Forth Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), have reported intensive dysfunctions [3]. Also, results of a study revealed that among depression symptoms, depressed mood and concentration difficulties had the strongest relationship with dysfunctioning in depression and they were the most disabling depressive symptoms observed at work environments, home managements, social activities, personal and interpersonal activities [4]. Moreover, depression is common among students, as 9% of them indicate depression at first semester [5]. The determination of factors which are influential in the development and incidence of depression among this population is the priority objectives of the study.

Different theoretical approaches have been developed to explain depression. Meanwhile, cognitive approaches assume that emotional responses are formed by negative interpretation of experiences. Accordingly, Beck's depression model, with its cognitive traid,

justifies the role of inefficient cognitive beliefs in the development of negative beliefs, initiation and continuance of depressed mood. On the other hand, in some cognitive approaches, the role of metacognitive factors has been emphasized on formation and continuation of depressed mood. It should be noted that metacognitions direct attention, determines ways of thinking and direct coping responses in a way that results in efficient knowledge. Wells (2000) considers metacognition as a multidimensional concept and proposes it as knowledge (beliefs), processes and strategies, which controls, evaluates and monitors cognition [6].

Metacognitive approach assumes that individuals suffer from an emotional distress, because their metacognition has resulted in a special pattern of responding to their internal experiences, resulting in continuation of their negative emotion and development of negative beliefs. This pattern (cognitive attentional syndrome) involves worry, rumination, fixated attention, self-regulation strategies or incompatible coping behaviors. Moreover, metacognitive treatment involves positive and negative content areas. Positive beliefs about worry refers to what extent an individual believes that being worried is useful. It seems that the individual assumes that focusing on the threat is useful and being concerned about the future helps him/ her to avoid danger. On the other hand, negative beliefs about worry refers to what extent the individual believes that worry is uncontrollable and dangerous [7]. According to *Wells and Mathieu's* theory of psychological dysfunctioning [8], metacognitive beliefs are considered as information about self-recognition, internal states and coping strategies, which could influence both elements. Hence, mental disorder causes cognitive- attentional syndrome through perseverative thinking, uncompromised uses of attention, preserved uncompromised coping and a combination of both components. Therefore uncompromised metacognitions such as negative beliefs about worry and positive beliefs about worry are developed to preserve such syndromes which is activated when confronting with a difficult situation [6].

On the other hand, studies have shown that cognitive biases such as rumination are consistently related to the development and preservation of depression [9]. Accordingly, *Joormann* [10], mentions that rumination is considered to be persistent and recurrent thoughts about an ordinary issue. Such thoughts enter consciousness unintentionally, deviating attention from considered and current issues. Furthermore *Bagby et al.* showed that rumination is related to increased symptoms of depression [11]. On the other hand, *Nolen-Hoksema* [12] as well as *Nolen-Hoksema et al.* [13] mentioned that those who ruminate are like individuals who experience worry, usually dwelling on events that have happened in past and they can't change. Besides, they tend to deal with rumination, which is usually precursor of the development or, rise of depression or its symptoms.

There are contradictory findings regarding the relationship between rumination and symptoms of

depression. *Lyobomirsky and Tkach's* studies (2004) revealed that ruminative reactive styles could be observed not only in depression, but also in anxiety [14]. The relationship between rumination and anxiety has also been emphasized in other researches [15].

On the other hand, Psychopathological studies have shown that rumination is a multicomponent process, where brooding and reflection are more emphasized than the other elements [16]. It should be noted that, there are also contradictory findings regarding the role of these elements in different states of depression. Another study emphasized the substantial and effective role of reflection in depressive mood [17]. This is while *Treynor et al.* indicated that reflection had no effective role in depressive mood [18]. On the other hand, *Burwell and Shrik* indicated that compared to reflection, brooding predicted the development of depressive symptoms [19]. Studies, which have been conducted based on cognitive models of depression have determined the role of negative cognitive styles and rumination as risk factors of depression [20]. *Just and Alloy* [21] indicated that patients with rumination, wrongly believe that rumination provides a better psychological insight.

Therefore, it seems that rumination plays a mediating role in the relationship between positive and negative beliefs about worry and depression. However, there are contradictory findings in the relationship between rumination and depression. The aim of the present study was to investigate the role of negative beliefs about worry and positive beliefs about worry in depression through rumination.

## Method

The present study was conducted with a correlational method. In terms of study objective, it was a pure research. Besides, it is regarded a cross- sectional study. The population of the present study involves all the students of the University of Tabriz in 2013-2014. It can be mentioned that 275 students (165 women and 110 men) by the mean age of 21/12(SD: 1.70) were selected using stratified sampling. Regarding the students ratio in each faculty, they were selected from the faculties of Humanity, Chemistry and Electricity.

**Metacognition Questionnaire-30 (MCQ-30):** This instrument was designed to evaluate some attributive metacognitive elements, some of which play a critical role in the metacognitive model of psychological disorder. Well's metacognitive Questionnaire is 30-item self-report scale, which measures the following five individual scales of metacognitive areas: 1- positive beliefs about worry, 2- negative beliefs about worry which are related to uncontrollability and danger, 3- weak cognitive confidence, 4- necessity of controlling thoughts and 5- cognitive self-awareness. The questions were designed on a Likert scale ranging from 1= disagree to 4=completely agree. Alpha Cronbach coefficients of the sub-scales were ranged from 0.72 to 0.93. Its retest correlation in time interval of 22-118 days was 0.75 for total number and it was in the range of 0.59 to 0.87 for subscales [22]. In Iran the questionnaire's internal consistency coefficient was

obtained 0.91 for the total scale, using Alpha Cronbach coefficient and it was in the range of 0.71 – 0.87 [23]. It should be noted that in this study, only two subscales of the questionnaire was used which includes subscales of positive beliefs about worry and negative beliefs about worry.

**Beck’s Depression Inventory (BDI-II):** This questionnaire is revised form Beck’s Inventory (2nd Edition). Compared to BDI-I, this version is mostly similar to DSM-IV-TR and like BDI-I this inventory has 21 questions. Relying on cognitive- behavioral aspects, this test involves 21 questions filled in a self-report way. Each answer of questions is scored as 0,1,2,3 where, 0 indicates no disorder, and score 3 indicates the most intensive disorder. The total score of the test is varied from 0-63. When analyzing the scores, individual’s scores are added up and the 0-9 score is considered as without depression, 10-18 light depression, 19-29 moderate depression and 30-63 as major depression. Different studies have confirmed psychometric characteristics of the questionnaire. In a study alpha Cronbach of the questionnaire was reported 92, its inter- item coefficient reported 0.35, correlation with other instruments including anxiety 0.53 and behaviors related to suicide was reported 0.57 for this questionnaire [24]. In Iran, the psychometric characteristics of the questionnaire has been confirmed with alpha coefficient of 0.87 and test retest coefficient of 0.74 [25].

**Rumination Response Scale (RRS):** This questionnaire was developed by *Treynor, Gonzalez and Nolen- Hoeksema* [18]. This scale of rumination response is a 22-item scale. Its items have been scored in a 4-point scale ranging from 1(almost never) to 4 (almost always). Total number of rumination is estimated by sum of data. Using alpha Cronbach (ranged from 0.88to 0.92) it was shown that the questionnaire has a higher internal reliability. Cluster internal correlation measured five times (0.75) was also high [26]. In Iran in a study reliability coefficient of the

questionnaire was obtained 0.94 and it was obtained 0.93 in a retest after 2 weeks [27].

**Results**

Table 1 shows the descriptive statistics of study variables. It shows that the distribution of the study variables is normal, since none of Kolmogorov Smirnov values are significant.

The Structural Equation Model (SEM) was used to evaluate the theoretical model and its fitness with the measured model to determine whether metacognitive beliefs could explain and predict depression changes through rumination. The covariance matrix variables was estimated (table 2). Contents of table 2 show that a) there is a positive covariance between negative beliefs about worry and rumination also there is a positive and significant covariance between these beliefs and depression. b) There is a positive covariance between positive belief about worry and rumination also there is a positive and significant covariance between these beliefs and depression.

Values of the model fit indices have been displayed in table 3. Indices of the measured model indicated that positive and negative beliefs about worry in the form of structural-causal relations could explain and predict depression changes by inefficient schema of rumination. Since RMSEA is in an optimum level (0.05) and  $\chi^2/df$  ratio is significant at level of  $P < 0.01$ . Goodness of Fit Index (GFI), Adjusted Goodness Fit Index (AGFI), Comparative Fit Index (CFI) and Normalized Fit Index (NFI) values are also desired (more than 0.90). The values of model fitness index have been shown in table 3.

The relations between positive and negative metacognitive beliefs and depression were presented in table 4. Table 4 indicates that a) positive and negative beliefs about worry has a positive and significant role in predicting depression and b) causal path of rumination on depression symptoms is positive and significant.

**Table 1.** Descriptive Statistics

Variables	M	SD	Kolmogrov- Smirnov Statistic	Sig
Positive belief about worry	13.69	4.09	1.15	0.32
Negative belief about worry	14.15	4.12	1.26	0.27
Rumination	14.48	4.02	1.52	0.21
Depression	31.12	7.92	1.57	0.18

**Table2.** Covariance matrix

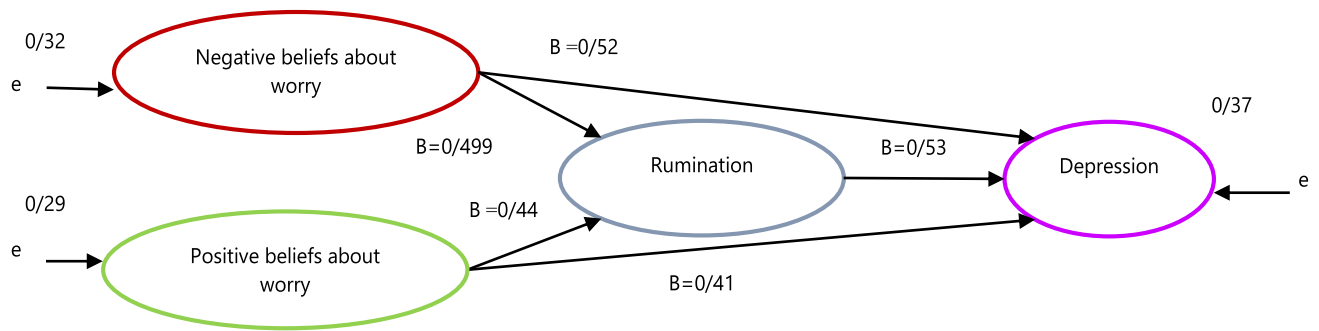
Variables	Negative belief about worry	Positive belief about worry	Rumination	Depression
Negative belief about worry	4.11	-	-	-
Positive belief about worry	-0.52	3.71	-	-
Rumination	1.07	0.97	-	-
Depression	1.13	1.04	1.26	4.12

**Table 3.** Fitness indexes of the model

RMSEA	$\chi^2$	df	$\chi^2/df$	P	GFI	AGFI	CFI	NFI
0.05	1575	315	5	0.001	0.94	0.93	0.93	.92

**Table 4.** Direct causal paths of metacognitive beliefs and incompatible schemas on symptoms of depression

Independent variables	Dependent variable	Coefficient of determination	t-statistic	Sig
Negative belief about worry	depression	0.52	4.26	0.01
Positive belief about worry	depression	0.41	4.07	0.01
Rumination	depression	0.53	4.81	0.01



**Model 1.** Causal – Structural relationships among metacognitive beliefs, rumination and depression

On the other hand, the Boot Strap method was used to determine the significant level of positive and negative beliefs about worry's indirect causal paths on depression symptoms by inefficient schemas. Based on this procedure, if both upper limit and lower limit of the Boot Strap have the same direction i.e. both are negative or

positive, then the indirect causal path would be significant. Table 5 shows that a) indirect causal path of negative belief about worry is positive and significant on depression symptoms through rumination. B) Indirect causal path of negative belief about worry is positive and significant on depression symptoms through rumination.

**Table 5.** Boot strap method for indirect causal paths test

Independent variable	Mediating variable	Dependent variable	Boot Strap Bond		Bias value	Estimation error	Indirect effect	Results
			Low Bond	high Bond				
Negative beliefs about worry	rumination	depression	0.1428	0.1451	0.0007	0.011	0.26	significant
Positive beliefs about worry	rumination	depression	0.1411	0.1421	0.0009	0.015	0.23	significant

**Discussion**

The aim of the present study was to investigate the role of positive beliefs about worry and negative beliefs about worry in depression by rumination. Results indicated that positive and negative beliefs about worry could predict depressive symptoms by rumination.

To explain these results, it can be mentioned that metacognition is a multidimensional concept and it includes wide sources such as positive beliefs or knowledge about individual's cognitive system, awareness about factors influencing these systems and, awareness about cognitive states and evaluation of importance of thoughts and memories [6]. Metacognitive approach of depression tries to explain rumination production in a three level model called Self-Regulatory Executive Function model (S- REF). In this model, rumination is related to self-regulation and emotional inefficiency in a three level structure in a way that rumination is used as a coping style with a depressive mood. Moreover, in this model, supportive metacognitive beliefs of rumination are effective in beginning and continuing such thinking styles.

On the other, the lowest level of S-REF which belongs to information processing networks and in this level negative internal feelings causes the motivation of negative beliefs and schemas. It should be noted that this level acts automatically, being activated as soon as special stimulation presented and its activity is achieved immediately [28]. Beck's schemas theory is related with this level of S- REF.

In addition, in this model, it is explained that each event or external stimulus, activates related thoughts of that

stimulus. After wards, searching for choosing a special coping style is triggered in the second level i.e. an executive system dependent on monitoring and a special coping strategy is applied regarding the existing situation. So, the second level i.e a monitoring dependent system is activated, which activates copying strategies with depressive mood including rumination. These two levels are associated by close bonds. At the second level, external stimuli along with internal thoughts are evaluated according to personal objectives and social limitations.

The third level is the knowledge of self, which presents self-beliefs and coping styles and in this level, rumination is activated as a coping style. In other words, in this level, supportive metacognitive beliefs of rumination set the stage of the application of such coping strategies. Thus, information processing moves dynamically between executive levels and lower level systems. This continues till resolving inconsistency between the existing condition and the desired condition. On one hand, it is claimed in this model that data processing requires interaction between executive level and third level (knowledge of self). Besides, the second level of the model is the reason for achieving coping strategies and choosing them requires the third level. In this model, metacognitive beliefs intensify ruminative thoughts and facilitate activation of rumination as a coping situation [6, 26,29].

On the other hand, when explaining these relations, *Nolen-Hoeksema* [12] mentions that depressive rumination involves thoughts which are activated when depressive symptoms, causes and effects of such disorder appear. *Nolen- Hoeskema* [13] considers rumination as passive and recurrent thoughts about depression

symptoms, reasons and outcomes. They also believe that rumination emphasizes symptoms and results of depression, intensifying such symptoms. Moreover Papageorgiou and Wells [26] in studying metacognitive beliefs among depressed patients, identified rumination in two forms of positive beliefs and negative beliefs. In the positive form, such beliefs are trigger of using rumination as one incompatible copying method to lower mood and its negative form starts when the individual feels helpless and such negative beliefs intensify the depression.

In addition, regarding the relationship between rumination and depression, a study mentioned that in depressed patients, rumination is considered as usual and symptomatic phenomenon, because the phenomenon causes confusion and failure of emotional processing. With the restriction of information processing self-helplessness, and recurrent thoughts appear, causing increase of depression and negative mood [30]. Liobomirsky and Katch [14] believe that rumination causes various pathological results in depressed patients, since such phenomenon intensifies and prolongs negative feelings, resulting in formation and continuation of negative thoughts, solving weak problems, weak motivation, concentration, confused cognition and too many of insolvable problems. Hence formation and continuation of rumination causes delays in the improvement of MDD.

Regarding the limitations of the study, it should be noted that, the present study was carried out on the students of the University of Tabriz. Hence, the results should be carefully generalized. On the other hand, the studied samples were non-clinical. Another limitation of the study was collecting data by questionnaires. It is assumed that the respondent gives correct and real answers, though it is probable that participants do not provide their realistic information.

## Conclusion

Based on the findings of this study, it can be argued that negative beliefs about worry and positive beliefs about worry mediating by rumination can predict depression disorder. Therefore, this study was limited to two subscales and it is proposed to future research to examine the role of other subscales. Hence it is suggested that clinical individuals be included in future studies.

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