Investigating Metacognitive Beliefs in Patients with Bipolar Disorders and Healthy Controls

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Abstract
Metacognition plays a significant role in the onset and perpetuation of bipolar disorder. One of the most prominent examples of impaired metacognitive functioning in bipolar disorder is the lack of insight into their own condition. Despite its importance, research on metacognition in bipolar disorder is scarce. Furthermore, the neurocognitive basis of metacognitive functioning is not well understood. The present study included 20 patients with bipolar disorder and 20 healthy individuals. All participants completed a metacognitive questionnaire examining their metacognitive beliefs. The results showed a statistically significant difference in metacognitive components between patients with bipolar disorder and healthy individuals in the domains of positive beliefs about worry, negative beliefs about uncontrollability of thoughts, cognitive confidence, negative beliefs about the need for control and self-consciousness. Compared to healthy individuals, patients with bipolar disorder exhibited incongruent metacognitive beliefs and demonstrated lower scores. The research findings support the conceptualization of metacognitive beliefs in bipolar disorder, which is crucial for understanding the etiology, perpetuation, and treatment of this disorder.

Keywords: Bipolar disorder, cognitive confidence, metacognitive beliefs

Introduction

Bipolar spectrum disorders, complex neurological and psychiatric disorders, are placed between depressive disorders and other psychotic disorders, where in all substances, there exists an oscillation between mania or depression or mania alone (American Psychiatric Association, 2003). Bipolar disorder is considered a chronic, severe, and unremitting mood disorder, the primary sign of which is disturbance in mood, and the initial diagnostic feature of this disorder is the occurrence of one or more major depressive episodes accompanied by at least one hypomanic episode during which the mood of these individuals is abnormally and continuously elevated, expansive, or irritable (Smith et al., 2005). The causes of this disorder are different and are associated with features of emotional disturbance, anxiety states, anger, depression, and risky behaviors such as substance abuse and self-harm. The prevalence of bipolar disorder type II in the general population is 0.5%, with it being more common in women than in men, and emotional instability, fluctuating behavior, and interpersonal sensitivity leading to disturbance in relationships with others are among its main characteristics (Preston et al., 2004).

New cognitive theories in psychopathology emphasize the role of psychology in the etiology and perpetuation of mental disorders. This concept encompasses the knowledge, processes, and strategies that evaluate, monitor, or control cognition (Wells et al., 2000). Today, researchers confirm the importance of metacognitive factors, which are also considered integral to the continuation of bipolar disorders, in understanding bipolar disorder. Since Cognitive-Behavioral Therapy (CBT) is one of the effective treatments for bipolar disorder (da Costa et al., 2010), it may be suggested that understanding metacognitions is important in treatment. In both CBT and Metacognitive Therapy (MCT) approaches, the content of pathological beliefs and thoughts of psychological distress is identified. Metacognitive functioning refers to the ability to think about our thinking (Semerari et al., 2003). The concept of metacognition was discussed in a recent article by Moritz and Lysaker (2018). Metacognition has its origin in experimental psychology. As Flavell (1979) defines it, metacognition has two key components, which are "metacognitive knowledge" and "metacognitive experience." Metacognitive knowledge controls our beliefs about our overall cognitive performance, while metacognitive experience involves perceived performance in tasks that evaluate our cognition.

Metacognition is a multi-faceted concept, encompassing knowledge, processes, and strategies that evaluate, monitor, or control cognition. The prevailing view among theorists distinguishes between two aspects of metacognition, namely metacognitive beliefs and metacognitive monitoring. Metacognition is defined as knowledge, belief, and cognition about one's own cognitive system (Flavell, 1979). As Wells and Matthews have pointed out, metacognition can be defined as "thinking about thinking."

The literature on metacognition presents various approaches that address the maintenance of psychological pathology related to Cognitive Attention Syndrome (CAS), which includes various maladaptive coping behaviors and self-regulation, such as thought suppression, avoidance, as well as stable thinking patterns like rumination, worry, and threat-focused attention (Wells, 2009).

Metacognitive belief consists of five dimensions that lead to the development of CAS. The findings presented by Papageorgiou support the application of the metacognitive model in bipolar disorder (Papageorgiou and Wells, 2003). This clinical model hypothesis demonstrates that positive metacognitions, which are beliefs related to using worry as a problem-solving strategy, initiate rumination. Ineffective positive metacognitions in solving problems give rise to negative metacognitions, which are beliefs about uncontrollability of rumination. Negative metacognitions lead to the development and maintenance of bipolar disorder.

Clinical impairment in cognitive performance confidence leads to the creation of both positive and negative metacognitions.

According to Wells and Matthews (1994), the Self-Regulatory Executive Function (S-REF) model is the first theory to conceptualize the role of metacognition in the etiology and persistence of psychological disorders. Based on the S-REF theory, psychological disorders persist when maladaptive coping strategies such as worry/rumination, threat monitoring, avoidance, and thought suppression disrupt and undermine ineffective beliefs, leading to increased access to negative self-referent information. According to this theory, a psychological disorder is an attentional bias syndrome that emerges from an individual's metacognitive knowledge, becoming activated and processed in problem situations (Wells, 2000).

Papageorgiou and Wells (2003) designed a metacognitive questionnaire for the assessment of cognitive biases and metacognitive beliefs in five dimensions:

1. Positive beliefs about worry (like "worry motivates me to cope")
2. Negative beliefs about worry that focus on its uncontrollable and dangerous nature
3. Cognitive self-consciousness (like "I have a poor memory")
4. Negative beliefs about thoughts, including punishment, superstitions, etc.
5. Cognitive confidence (such as intensely monitoring how my mind works).

In their study, Kazemi and Ghorbani (2012) found a significant and positive relationship between metacognitive components and dysfunctional attitudes in inpatients with Bipolar II disorder. They concluded that higher levels of metacognition exacerbate the dysfunctional attitudes in patients with Bipolar II disorder. Sarisoy and colleagues (2012) conducted a comparative study of metacognitive beliefs regarding cognitive injury in patients with unipolar and bipolar depressive disorders. The results showed that the scores for negative beliefs about uncontrollability and danger regarding worry, and the belief in the need to control thoughts, were higher in both patient groups (unipolar and bipolar) compared to the healthy control group.

Bipolar disorder has negative impacts on various aspects of quality of life. Given its significance in terms of onset and the burden it imposes on society, it is essential to investigate the pathology of this disorder, especially considering the psychotherapeutic treatments utilized. Therefore, this research aims to examine metacognitive beliefs in patients with bipolar disorders and a non-clinical control group. The purpose of this research is to answer the following question: Are metacognitive beliefs a good predictor for bipolar disorder?

Research Method

The current research was an analytical-comparative study conducted cross-sectionally. The statistical population of this study included patients diagnosed with Bipolar Disorder II according to the criteria of the DSM-5, who had been admitted to psychiatric centers affiliated with Urmia University. From this population, 40 female patients were selected as a convenience sample. The inclusion criteria consisted of having a definitive diagnosis of Bipolar II disorder based on the DSM-5 criteria in the patient's file by a psychiatrist, at least a fifth-grade literacy level, having no intellectual disabilities, and receiving mood stabilizing medications. The exclusion criteria included a history of electroconvulsive therapy in the past six months, a history of traumatic brain injury or neurological disorders according to the patient's file, the presence of acute side effects due to medication, and a history of substance abuse.

A clinical psychologist and a psychiatrist conducted DSM-IV diagnostic interviews with all patients with Bipolar II disorder (who were referred to Urmia University psychiatric centers) and if they diagnosed them with Bipolar II disorder based on the DSM-5 criteria, they were enrolled in the study. If there was a discrepancy in the diagnoses, the individual in question would be excluded from the study. All patient groups underwent evaluations and assessments successively,

while the non-clinical control group, who had no history of psychiatric diagnosis, were randomly assessed at their initial visit.
Two groups of patients were included in the study: individuals with Bipolar II disorder (n=20) and a non-patient control group (employees working in hospital departments) (n=20) as the sample group.

Research Tools

- Metacognitive Questionnaire (MCQ-30):

This is a 30-item self-report scale that measures individuals' beliefs about their thinking. Responses on this scale are calculated using a four-point Likert scale (1=strongly disagree to 4=strongly agree). This scale consists of five subscales:
1. Uncontrollability and danger beliefs, which emphasize concerns about uncontrollability and dangerousness of thoughts.
2. Positive beliefs about worry (e.g., Worrying helps me to cope).
3. Cognitive confidence (e.g., I pay close attention to the way my mind works).
4. Cognitive self-consciousness (e.g., I have a poor memory).
5. Need for control of thoughts.

This questionnaire was developed by Wells and Cartwright and was translated and prepared for the Iranian population by Shirinzadeh. The Cronbach's alpha coefficient for the subscales of metacognitive beliefs questionnaire ranges from 0.72 to 0.93 (Wells, 2004). The Cronbach's alpha coefficient for the metacognitive beliefs questionnaire in the Iranian sample was reported as 0.94 (Shirinzadeh Dastgiri et al., 2007).
To examine the difference in metacognitive beliefs between the two groups, a multivariate analysis of variance (MANOVA) was used. One of the prerequisites for using this analysis was the equality of error variances. The results of Levene's test indicated the fulfillment of this assumption for all components ($p > 0.05$). The data was analyzed using the SPSS software, version 18.

Findings

The demographic characteristics of the study participants are presented in Table 1.

Table 1- Demographic characteristics of the participants

Demographic Variables		Frequency
Age	20-30 years	15
	31-40 years	15
	41-50 years	10
Education	High school diploma	15
	Bachelor's degree	20
	Master's degree	5
	Doctorate	0
Marital Status	Single	24
	Married	16

The distribution of patients based on marital status indicated that 24 individuals (60%) were single and 16 individuals (40%) were married. The data also revealed that 15 individuals (37.5%) of the research patients were in the age range of 20-30 years, 15 individuals (37.5%) were aged 31-40, and 10 individuals (25%) were aged 41-50. Regarding education, 15

individuals (37.5%) held a high school diploma, 20 individuals (50%) had a bachelor's degree, and 5 individuals (12.5%) had a master's degree (Table 1).
Table 2 displays the mean and standard deviation of the sample group scores on the metacognitive questionnaire.

Table 2- Average and standard deviation of sample group scores in MCQ

Groups	Average	Standard Deviation
Bipolar Disorder	۷۶.۴۵	۸.۹۳
Non-patient Group	۴۰.۸۰	۵.۷۶

The results of the Levin test showed that the assumption of equality of variances between the two groups in the community is confirmed. Confirmation of the assumption of variance equality in the community implies the equality of distribution of scores of recognized patients with bipolar disorder and the non-patient control group in the community (F=65.1, P=0.104).
Table 3 compares the MCQ-30 scores between the patient group and the control group.

Table 3- Results of analysis of variance on sample group scores in the sub-scales of the metacognition questionnaire

Metacognition Questionnaire Subscales	Groups	Average	Standard Deviation	F-Value	P-Value
Positive beliefs about worry	Normal	10.49	6.82	12.41	0.001
	Bipolar	18.16	7.50		
Negative beliefs about uncontrollability of thoughts	Normal	12.45	6.90	14.42	0.001
	Bipolar	33.49	6.99		
Cognitive confidence	Normal	5.01	4.67	9.69	0.001
	Bipolar	9.79	5.07		
Negative beliefs about need to control	Normal	8.44	4.21	11.48	0.001
	Bipolar	15.65	4.81		
Awareness	Normal	5.16	3.52	6.04	0.001
	Bipolar	8.96	3.65		

The total score of MCQ-30 and sub-scores of positive beliefs about worry, negative beliefs about uncontrollability of thoughts, cognitive confidence, cognitive self-consciousness, and negative beliefs about the need for control in the control group were significantly lower than the bipolar disorder group (p=0.001).
According to the findings in Table 3, there is a significant difference between the two groups in all cognitive components. In other words, normal individuals obtained better scores in all tests compared to individuals with bipolar disorder.

Discussion and Conclusion

Bipolar disorder is a familiar and relatively common condition that, beyond subjecting the patient to considerable suffering, also results in significant time loss. Due to its disabling nature,

it significantly impairs normal and natural aspects of life, personal capabilities, work efficiency, social adaptation, and interpersonal relationships.

In our study, the cognitive differences between bipolar patients and healthy individuals were examined. The bipolar patients participating in this study scored higher in cognitive beliefs, except for positive beliefs, compared to healthy individuals. Consistent with the findings of this study, in a study examining cognitive confidence in bipolar disorder compared to the control group, statistically higher scores were obtained, and no significant difference was observed between unipolar and bipolar depression. Additionally, no statistically significant differences were observed in terms of cognitive self-consciousness and positive beliefs regarding worry between the groups. The results obtained from our study are in line with the study conducted by Eurok et al. (2021).

The results of this research support the model of executive self-regulation in psychological disorders and are in line with the findings of Carver and Scheier (1997) regarding the correlation between different cognitive beliefs and emotional disorders. Moreover, relying on this finding, evidence can be found to support the general hypothesis that cognitive beliefs and cognitive beliefs are linked to psychological disorders. This hypothesis is supported by comparing high scores of disorder and maladaptive cognitive beliefs in patients with schizophrenia, obsessive-compulsive disorder, and social phobia compared to non-patient control group. The first hypothesis of the research, based on the widespread difference in cognitive beliefs in patients with bipolar disorder, is confirmed based on the results of the analysis. It seems that this finding is consistent with the findings of Eurok et al. (2021), as well as Sussor et al. (2019) regarding the presence of a relationship between cognitive beliefs and psychotic experiences (delusions and hallucinations) and the severity of cognitive disorders in this spectrum of patients, as in the current study, patients with bipolar disorder demonstrated higher levels of cognitive impairment and maladaptive cognitive components.

Beliefs in cognitive psychology cause individuals to feel less personal control, resulting in increased anxiety and depression. On the other hand, cognitive beliefs of uncontrollability and danger lead to increased self-doubt about their abilities and worth, which negatively affects their mental health; thus, patients with bipolar disorder had higher scores in cognitive beliefs compared to the control group.

The findings of this study support the cognitive model of bipolar disorder presented by Wells. There are limitations in this study that may affect the generalizability of the results, including difficult access to individuals with borderline personality disorder and other criteria mentioned in the research, as well as the limited sample size and limited clinical community involvement.

In conclusion, the current research findings indicate that patients with bipolar disorder, similar to patients with anxiety disorders (Toneatto, 1999), substance abusers (Wells and Papageorgiou, 1998), and those with borderline personality disorder, suffer from more distorted cognitive beliefs and patterns, which lead to reduced cognitive functioning and increased emotional distress in these patients. Given the previous weak research background in bipolar disorders, it is suggested that similar research be conducted in other phases of the disease. Since cognitive and cognitive impairments are raised in this research, it is suggested that cognitive or cognitive therapies be used in future research, and after treatment, the cognitive beliefs of individuals with bipolar disorder be examined. Therapeutic strategies based on cognitive distortion correction and executive control can be used as beneficial methods in treating these patients.

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