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The relationship between transdiagnostic factors and psychotic symptoms in individual with schizophrenia disorder

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Abstract

Introduction: The present study aimed to investigate the relationship between transdiagnostic factors and psychotic symptoms in individuals with schizophrenia disorder.

Materials and Methods: In this descriptive-correlational study, 60 individual with schizophrenia disorder in Mashhad and Neyshabur in 2017 were selected by convenience sampling method. The participants completed Positive and Negative Syndrome Scale (PANSS), Intolerance of Uncertainty Scale (IUS), Cognitive Avoidance Questionnaire (SAQ), Metacognition Questionnaire (MCQ), Acceptance and Action Questionnaire-II (AAQ-II) and Cognitive Emotion Regulation Questionnaire (CERQ). Data were analyzed by Pearson correlation and regression analysis.

Results: The result showed that there are significant relationships between transdiagnostic factors, namely intolerance of uncertainty (P=0.01), cognitive avoidance (P=0.01), experiential avoidance (P=0.01), worry about worry (P=0.01), adaptive (P=0.01) and maladaptive (P=0.05) cognitive emotion regulation, and psychotic symptoms. In addition, experiential avoidance and intolerance of uncertainty predicted psychotic symptoms in individuals with schizophrenia disorder.

Conclusion: The results of this study emphasize the importance of transdiagnostic factors in experience of psychotic symptoms in individuals with schizophrenia disorder.

Keywords: Emotion, Psychotic symptoms, Schizophrenia, Transdiagnostic factors

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Introduction

Schizophrenia refers to a complex and chronic syndrome affecting different human functions, which leads to devastating effects on individuals and their families (1). This disorder is diagnosed by a series of positive, negative, and disorganized symptoms, such as delusions, hallucinations, apathy, alogia, diminished emotional expression, affective flattening, and anhedonia, as well as disorganized speech and behavior (1,2). Abnormalities in releasing neurotransmitters (dopamine, serotonin, glutamate, glycine and GABA), brain structural abnormalities (larger third and lateral ventricles, smaller medial temporal lobe) (3), and other risk factors including childhood adversities, cannabis use, stressful events during adulthood and history of obstetric complications are also associated with schizophrenia (4). Another set of cognitive, metacognitive and emotional factors that are known as transdiagnostic factors can be associated with psychotic symptoms in individuals with schizophrenia. These are pathological processes common in different mental disorders (5,6). Because of the focus on the underlying processes involved in mental disorders, help to explanation the comorbidity and help to evaluation and the treatment of mental disorders, these transdiagnostic factors are currently paid more attention by researchers (7).

Intolerance of uncertainty, negative beliefs about worry (met-worry), cognitive avoidance, experiential avoidance and emotion regulation or cognitive emotion regulation strategies are considered as transdiagnostic factors (5-10). Intolerance of uncertainty is a kind of dispositional characteristic that leads to negative beliefs about uncertainty and its implications (11). The previous research indicates a positive relationship between intolerance of uncertainty with paranoid and psychotic symptoms of patients with persecutory delusions (12). White and Gumley concluded that there is a positive relationship between intolerance of uncertainty and negative beliefs about paranoia in individuals with psychosis. However, there is no relationship between intolerance of uncertainty with the total score of beliefs about paranoia or metacognitive beliefs about paranoia and its components, that is, beliefs about paranoid as a survival strategy as well as the normalizing beliefs. The study also showed that there was relationship between the intolerance of uncertainty and meta-cognitive beliefs related to hallucinatory voices and its components, that is, metaphysical beliefs and beliefs about loss of control (13). Cognitive avoidance involves implicit (such as avoidance of threatening mental images) and explicit strategies (such as suppressing worrisome thoughts, using distraction as a way interrupt worrying, avoiding situation that can lead to worrisome thinking) that can lead to the avoidance of threatening cognitive and emotional content (14). Additionally, Borkovec et al. characterize worry as a kind of cognitive avoidance (15). The previous research indicates that worry relate with higher levels of paranoia and persecutory delusions (12), as well as positive, negative, general symptoms of psychosis and various types of delusions (16). Nevertheless, some studies suggest that there is no difference in cognitive avoidance between patients with schizophrenia and normal individuals (17).

Negative beliefs about worry or meta-worry as one of the other factors of transdiagnostic refer to people's belief about the uncontrollability and danger of worry (18). Review of previous research indicates that negative belief about worry correlate with paranoid and psychotic symptoms of individuals with persecutory delusions (12),

positive, negative and general symptoms of patients with schizophrenia spectrum diagnoses (16), distress caused by delusional beliefs (19) as well as positive and negative symptoms of schizophrenia patients (20). Experiential avoidance refers to attempts to alter, escape, avoid and control of unpleasant inner experiences (such as thoughts, emotions, sensations, memories) (21). Goldstone, Farhall and Ong found that psychosis patients experience more experiential avoidance compared with non-clinical individuals. Moreover, there is a significant relationship between experiential avoidance with the delusions and delusional distress in non-clinical individuals and paranoid patients (22). Also, a significant relation has been reported in another study between experiential avoidance and paranoia (23).

Cognitive emotion regulation strategies are mental strategies individuals use to cope with the intake of emotionally arousing information (24). In a meta-analysis study, O'Driscoll, Laing and Mason analyzed 47 studies and concluded that cognitive emotion regulation strategies were related to schizophrenia. Their results showed that schizophrenia patients are more likely to us maladaptive cognitive emotion regulation strategies than healthy individuals. Also, they are less likely us of adaptive cognitive emotion regulation strategies (cognitive reappraisal). In addition, emotion management, experiential avoidance, attentional deployment, dissociation and alexithymia are related to schizophrenia (25). The results of literature review are confusing. Some studies did not find any difference in the cognitive reappraisal and emotion suppression strategies in individuals with schizophrenia and healthy people (26,27). However, some studies indicated that there was a difference between the two groups in acceptance and experiential avoidance strategies (26). Finally, results of some studies showed that patients with schizophrenia used emotion suppression strategy to regulate emotion, there was no difference in their cognitive reappraisal (28). Although in some studies, the relationship between some of the transdiagnostic factors and psychotic symptoms of patients with schizophrenia has been investigated, the relationship between all these factors and psychotic symptoms has not been studied in one study. Furthermore, the prevalence of schizophrenia disorder and its consequences implies the importance of considering transdiagnostic approaches along with other therapy ways for mental disorders. As a result, the aim of present study was to investigate the relationship between transdiagnostic factors and psychotic symptoms in individuals with schizophrenia disorder.

Materials and Methods

This correlational-descriptive study conducted after approval by the Ethics Committee of Islamic Azad University, Neyshabur Branch. The statistical population of this study consisted of all patients diagnosed with schizophrenia in Neyshabur and Mashhad in 2017. Convenience sampling method was used to select 60 individual from among patients who referred to Neyshabur Neuroscience Center and Ibn-e-Sina Psychiatric Hospital in Mashhad. Inclusion criteria included the diagnosis and confirmation of the presence of schizophrenia by the psychiatrist and the informed consent received from individuals or their legal guardians to participate in the study. Exclusion criteria included the lack of informed consent of individuals or their legal guardians, physical disabilities such as blindness, illiteracy, and lack of full response to research tools. Ethical considerations included the informed consent of individuals to participate in

research, the emphasis on the confidentiality of information and the avoidance of harm to them. Data were analyzed by SPSS version 24 using descriptive statistics, Pearson correlation, and regression analysis. Participants completed the following tests.

Research instrument

A) The Positive and Negative Syndrome Scale (PANSS): This is a self‑report measure consisting of 30 items used to evaluate the severity of the symptoms of schizophrenia. The components of this questionnaire are scored based on a 7-point Likert scale from 1 (absent) to 7 (extreme). Additionally, the scale includes three subscales of positive (7 items), negative (7 items), and general psychopathology (16 items). The reliability of these three subscales has been reported to be 0.73, 0.83 and 0.79, respectively (29), using the internal consistency method (Cronbach's alpha). However, in Iran, Ghamari Givi, Molavi and Heshmati used a 5-point Likert scale (1 = absent and 5 = extreme) for scoring. They reported the reliability of the total score of the test to be 0.75 (30). In the present study, Cronbach's alpha coefficient of the whole scale was 0.92, and those of subscales of negative, positive, and general psychopathology were reported to be 0.82, 0.74 and 0.86, respectively.

B) Intolerance of Uncertainty Scale: The tool is a 12-item questionnaire designed to assess the emotional, cognitive and behavioral responses to uncertainty or ambiguous situations. The items of the questionnaire are scored on the basis of a five-point Likert scale from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The internal consistency reliability of this questionnaire is reported to be 0.96 (31). In this research, the internal consistency reliability of the test was 0.87.

C) Cognitive Avoidance Questionnaire: This is a self‑report measure consisting of 25 items, whose items are scored on a five-point Likert scale from 1 (not at all) to 5 (completely). The reliability of this questionnaire by using internal consistency and test-retest method was reported to be 0.95 and 0.85, respectively, (32). Cronbach's alpha coefficient of the Persian version of this questionnaire by using internal consistency has been reported to be 0.89. Also, the results of confirmatory factor analysis indicated good and satisfactory indices (CFI = 0.95, NFI = 0.93, NNFI = 0.94, IFI = 0.95, RFI = 0.92, GFI = 0.89, RMSEA=0.07) (33). Cronbach's alpha coefficient was obtained equal to 0.86 in the present study.

D) Acceptance and Action Questionnaire –II (AAQ-II): It is a 7‑item self‑report instrument scored on a 7‑point scale ranging from 1 (never true) to 7 (always true). The mean Cronbach’s alpha coefficients were reported equal to 0.84 (0.78–0.88). In the research conducted by Mansouri et al. Cronbach's alpha coefficient was estimated to be 0.85. The results of the confirmatory factor analysis confirmed good and satisfactory indices (CFI = 0.98, NFI = 0.98, NNFI = 0.97, IFI = 0.98, RFI = 0.96, GFI = 0.98, RMSEA=0.078) for the questionnaire (33). In this research, the reliability of the test was 0.90, calculated by internal consistency method.

E) Metacognitions Questionnaire-30: This is a 30-item instrument scored on a four‑point scale from 1 (do not agree) to 4 (completely agree). It also has five subscales of cognitive confidence, positive beliefs about worry, cognitive self-consciousness, negative beliefs about uncontrollability of thoughts and danger, and beliefs about need to control thoughts. The reliability of this questionnaire by using internal consistency method was reported to be 0.72 to 0.93. The

reliability of this questionnaire by using test-retest method for the total score and for subscales was reported to 0.75 and 0.59-0.87, respectively, (35). The Cronbach alpha coefficient of the Persian version of the subscale of negative beliefs about worry was estimated to be 0.75. The results of confirmatory factor analysis also showed good and satisfactory indices (CFI = 1, NFI = 0.99, NNFI = 0.99, IFI = 1, RFI=0.98, GFI = 0.99 = RMSEA = 0.02) (33). In this study, Cronbach's alpha coefficient was calculated to be 0.68.

F) Cognitive Emotion Regulation Questionnaire: This questionnaire consists of 18 items scored from 1 (almost never) to 5 (almost always). The questionnaire consists of 9 subscales divided into adaptive (including positive reappraisal, refocus on planning, positive refocusing, putting into perspective, and acceptance) and maladaptive (self-blame, other blame, rumination, and catastrophizing) groups. The Cronbach's alpha coefficients for the subscales are reported to range from 0.67 to 0.81 (36). Mansouri et al. reported the total score of the test and its subscales to be 0.72, 0.88, 0.78, 0.63, 0.84, 0.81, 0.74, 0.66, 0.83 and 0.86, respectively. The reliability coefficients of adaptive and maladaptive cognitive emotion regulation strategies are estimated to be 0.82 and 0.74, respectively. The results of the confirmatory factor analysis for the two-factor structure (CFI= 0.96, NFI= 0.94, NNFI= 0.95, IFI= 0.96, RFI= 0.93, GFI= 0.94 and RMSEA= 0.05) and the 9-factor structure (CFI=0.98, NFI= 0.96, NNFI= 0.97, IFI= 0.98, RFI=0.94, GFI=0.96, and RMSEA=0.04) was good and satisfactory (33). The reliabilities of adaptive and maladaptive cognitive regulation strategies by using internal consistency method were equal to 0.85 and 0.71, respectively.

Results

The mean and standard deviation of the participants' age was 35.67±11.23 years. Table 1 showed that descriptive findings of other demographic data.

Table 1. Demographic characteristics of patients

Variables		Frequency	Percent	Variables		Frequency	Percent
Sex	Female	21	35	Employment status	Employment	10	16.7
	Male	39	65		Unemployment	50	83.3
Educational status	Elementary	14	23.3	Social class	Lower class	22	36.7
	Middle school	18	30		Lower middle class	6	10
	Diploma	20	33.3		Middle class	23	38.3
	Undergraduate degree and higher	8	13.3		Upper middle class	3	5
Marital status	Single	33	55		Upper class	6	10
	Married	18	30				
	Divorced	9	15				

The mean and standard deviation as well as correlation coefficients related to the relationship between transdiagnostic factors and psychotic symptoms in patients with schizophrenia are presented in Table 2. The results of Table 2 indicate that there is a significant positive correlation between transdiagnostic factors such as intolerance of uncertainty, cognitive avoidance, negative beliefs about worry and experiential avoidance with the total score of psychotic symptoms and its components, i. e, negative, positive, and general symptoms (P<0.05). However, there is no relationship between

cognitive avoidance and the negative symptoms of psychosis (P<0.05). In addition, the results show that there is a significant positive correlation between maladaptive cognitive emotion regulation strategies as one of transdiagnostic factors and the total score of psychotic symptoms and its components, that is, negative, positive and general symptoms (P<0.05). Furthermore, there is a significant negative correlation between cognitive emotion regulation strategies and the total score of psychotic symptoms and its components, that is, negative and general symptoms (P<0.05). Nevertheless, there is no correlation between adaptive cognitive emotion regulation strategies and positive symptoms.

In order to predict psychotic symptoms based on transdiagnostic factors, regression analysis was conducted. Normality analysis of the psychotropic symptoms indicated that this variable had normal distribution (P=0.19, P<0.05). The Durbin Watson Index was 2.13. Also, tolerance (0.54) and VIF (1.84) indices showed that regression assumptions were observed (Table 3).

Table 2. Descriptive findings (mean, standard deviations) and correlations between transdiagnostic factors and psychotic symptoms

Variables		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Cognitive avoidance	-																		
2	Negative beliefs	0.35**	-																	
3	Experiential avoidance	0.38**	0.50**	-																
4	Intolerance	0.57**	0.48**	0.67**	-															
5	Self-blame	0.02	0.16	0.12	0.15	-														
6	Acceptance	0.22	0.07	0.10	0.04	0.14	-													
7	Rumination	0.52**	0.37**	0.40**	0.49**	0.21	0.45**	-												
8	Positive refocusing	0.10	-0.14	-0.40**	-0.18	-0.09	0.21	0.20	-											
9	Refocus on planning	0.34**	0.05	0.008	0.14	-0.01	0.33**	0.42**	0.49**	-										
10	Positive reappraisal	0.33**	-0.05	-0.11	-0.02	-0.02	0.34**	0.32**	0.58**	0.59**	-									
11	Putting into perspective	0.11	0.08	-0.04	0.04	0.04	0.43**	0.42**	0.32**	0.47**	0.44**	-								
12	Catastrophizing	0.14	0.10	0.34**	0.47**	0.33**	0.02	0.37**	-0.11	-0.06	0.08	0.01	-							
13	Other blame	0.18	-0.14	0.13	0.15	-0.22	-0.02	0.18	0.12	0.13	0.19	0.15	0.23	-						
14	Adaptive strategies	0.31*	0.001	-0.11	0.007	0.01	0.64**	0.49**	0.71**	0.80**	0.81**	0.70**	-0.06	0.15	-					
15	Maladaptive strategies	0.35**	0.18	0.40**	0.50**	0.51**	0.23	0.70**	0.05	0.18	0.16	0.25	0.77**	0.51**	0.24	-				
16	Negative symptoms	0.22	0.32**	0.59**	0.53**	0.26*	0.10	0.14	-0.45**	0.23	-0.29*	-0.18	0.16	0.08	-0.34**	0.25*	-			
17	Positive symptoms	0.43**	0.41**	0.66**	0.66**	0.01	0.01	0.41**	-0.19	0.01	-0.11	-0.12	0.27*	0.31*	-0.11	0.41**		-		

18	General symptoms	0.36**	0.46**	0.70**	0.61**	0.08	-0.05	0.31*	-0.36**	-0.15	-0.29**	-0.10	0.33**	0.22	-0.26*	0.38**	0.72**	0.79**	-	
19	Total score-PANSS	0.38**	0.45**	0.72**	0.66**	0.12	0.06	0.32*	-0.38**	-0.15	-0.27*	-0.14	0.30*	0.22	-0.27*	0.39**	0.84**	0.87**	0.96**	
Mean		76.55	17.15	28.60	42.33	4.75	6.87	7.28	4.8	6.42	6.10	5.05	7.02	6.35	29.23	25.4	18.83	17.75	42.50	79.08
SD		21.56	4.80	13.06	11.27	2.98	3.04	2.90	2.78	3.01	2.83	2.37	2.87	3.26	10.31	7.44	6.57	6.01	12.51	22.89

**P<0.01, *P<0.05

Table 3. Transdiagnostic factors as predictors of psychotic symptoms in individual with schizophrenia

Model		R	R Square	Adjusted R Square	B	Beta	t	P
1	Experiential avoidance	0.72	0.53	0.52	1.27	0.72	8.06	0.0001
2	Experiential avoidance intolerance of uncertainty	0.76	0.58	0.57	0.90 0.63	0.51 0.31	4.43 2.66	0.0001 0.01

The results of Table 3 indicate that among transdiagnostic factors, the two factors of experiential avoidance and intolerance of uncertainty are predictors of psychotic symptoms (P<0.05). As seen in Table 3, experiential avoidance alone accounts for 53% of the variance in psychotic symptoms. And in the next step, after the addition of intolerance of uncertainty, these two variables account for 58% of the variance of psychotic symptoms.

Discussion

The purpose of this study was to investigate the relationship between transdiagnostic factors and psychotic symptoms in individual with schizophrenia disorder. Results indicated that there is a relationship between all factors of transdiagnostic, that is, intolerance of uncertainty, cognitive avoidance, negative beliefs about worry and experiential avoidance with psychotic symptoms. In the following, these relationships are discussed further. The results of this study showed that intolerance of uncertainty levels related with higher levels of positive negative and general symptoms as well as the total score of psychotic symptoms. Therefore, the findings of previous studies (16,23) were repeated in the present research. Sturtup et al. concluded that there is a relationship between intolerance of uncertainty with paranoia and psychotic symptoms in patients with persecutory delusions (12). White and Gumley studied 27 patients with psychosis. They concluded that there was a positive relationship between intolerance of uncertainty and negative beliefs about paranoia. However, there was no relationship between intolerance of uncertainty and the total score of paranoid beliefs about paranoia or metacognitive beliefs about paranoia and its components, that is, beliefs about paranoid as a survival strategy and normalizing beliefs. They found that the intolerance of uncertainty correlated with meta-cognitive beliefs related to hallucinatory voices and its components, that is, metaphysical beliefs and beliefs about loss of control. However, there is no relationship between intolerance of uncertainty and positive beliefs factors (13).

The findings of this study indicated that cognitive avoidance related with psychotic symptoms in individual with schizophrenia disorder. In the other words, there is a relationship between higher levels of cognitive avoidance and higher levels of positive and general symptoms as well as the total score of psychotic symptoms. However, no relationship was found

between cognitive avoidance and negative symptoms. Although no study on the relationship between cognitive avoidance and psychotic symptoms has been found, literature review indicates that worry, known as a cognitive avoidance (14,15) is correlated with higher levels of paranoia and delusions in individuals with persecutory delusions (12). This research shows that social and health worries are related to positive, general, total score of psychotic symptoms, and various types of delusions in patients with schizophrenia spectrum. No relationship has been found between these worries with the negative psychotic symptoms and types of hallucinations. They reported that there is not difference between patients with schizophrenia spectrum diagnosis and individuals with anxiety disorders in various kinds of worry (16).

Nevertheless, other studies have reported no relationship between worry with persecutory delusions and its components, that is, delusional conviction, delusional preoccupation and delusional distress in individuals with persecutory delusions. They reported that there is not differences between persecutory group and anxious group in worry (19). Additionally, Ventura et al. (17) did not observe any difference in avoidance coping responses, especially cognitive avoidance, when examining the copping responses of recent-onset schizophrenia patients and normal people.

The present study showed that there is a relation between negative beliefs about worry and the psychotic symptoms of individuals with schizophrenia. Negative beliefs about worry correlate with higher levels of positive, negative, and general symptoms as well as the total score of psychotic symptoms. Previous studies indicate that there is a relationship between negative beliefs about worry or meta-worry with paranoia and psychotic symptoms in patients with persecutory delusions (12); positive, negative, general symptoms, total score of symptoms of psychosis, delusions cognitive, delusions emotional, hallucinations emotional in individuals with schizophrenia spectrum diagnosis (16), distress caused by delusional beliefs in patients with persecutory delusions (19), as well as positive and negative symptoms of individuals with schizophrenia (20). Therefore findings of the present study are concordant with those of the above mentioned studies. The previous studies showed that there is a significant relation between experiential avoidance and psychotic symptoms in patients suffering from schizophrenia disorder (22,23,25). The findings of the present study indicated that the levels of experiential avoidance correlate with higher levels of positive, negative and general symptoms as well as the total score of psychotic symptoms. Similarly, Goldstone et al. found that clinical psychosis patients experience less cognitive flexibility and more experiential avoidance in comparison to non-clinical individuals. They also conclude that there is a relationship between experiential avoidance and delusions as well as delusional distress in non-clinical people and also with delusions as well as the delusional distress of paranoid patients. It is worth mentioning that in Goldstone et al. study a high score in the acceptance and action questionnaire was associated with more psychological flexibility (22). In another study, Udachina et al. concluded that there is a relationship between experiential avoidance and delusional experiences of paranoid patients (23). Finally, O'Driscoll et al. in a meta-analysis study found that there was a relationship between experiential avoidance and schizophrenia (25).

This study found that adaptive and maladaptive cognitive emotion regulation

strategies correlated with psychopathological symptoms of individuals with schizophrenia disorder. There was a relationship between more use of maladaptive cognitive emotion regulation strategies with higher levels of positive, negative, general symptoms and the total score of psychotic symptoms. Additionally, there was an inverse relationship between adaptive strategies with negative symptoms, general symptoms and the total score of psychotic symptoms. There was no relationship between adaptive strategies with positive symptoms. Perry et al. (26) indicated that there was no difference in suppression and reappraisal strategies in healthy individuals and schizophrenia patients. However, they found that there was difference between the two groups in the acceptance strategy or experiential avoidance. In the other word, schizophrenia patients reported using fewer acceptances. Also, Henry et al. (27) found that no difference in suppression and reappraisal strategies in patients with schizophrenia compared with healthy individuals. Van der Meer et al. (28) reported that patients with schizophrenia use more emotion suppression strategy to regulate their emotions; however, no difference was found between them and those in the control group in reappraisal strategy. Finally, O'Driscoll et al. in a meta-analysis study found that emotional management and psychological reappraisal are related to schizophrenia (25). Findings of the present study are concordant to those of the above mentioned studies, indicating that there is a relationship between emotion regulation strategies and psychotic symptoms. Yet, most of the above studies are causal comparisons. Unlike the present study, other studies used Gross and John's emotion regulation questionnaire.

This study has several limitations. This is a cross-sectional study conducted on the relationship between transdiagnostic factors and psychotic symptoms in individuals diagnosed with schizophrenia. Therefore, longitudinal studies can provide more accurate information. Additionally, variables were measured only through self-report instruments which could affect the results of the research for various reasons such as bias. Moreover, in the present attention has been paid to the certain transdiagnostic factors. Therefore, it is suggested that future studies, based on financial support, pay more attention to other transdiagnostic factors.

Conclusion

The results of the present study indicated a relationship between transdiagnostic factors such as cognitive avoidance, intolerance of uncertainty, negative beliefs about worry, experiential avoidance, and cognitive emotion regulation strategies with psychotic symptoms in schizophrenic patients. Moreover, experiential avoidance and intolerance of uncertainty predict psychotic symptoms in patients suffering from schizophrenia.

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