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ORIGINAL RESEARCH

The relationship between cognitive flexibility and cognitive fusion with the borderline personality disorder symptoms

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Abstract

Since researches have shown that maladaptive cognition plays a role in the beginning and maintenance Borderline Personality Disorder (BPD), this research aims to evaluate the relationship between cognitive flexibility and cognitive fusion with borderline personality disorder symptoms. 356 students of Mazandaran University of Medical Sciences who studied in the academic year of 2017-2018 were selected using cluster sampling method and they completed Cognitive Flexibility inventory (CFI), Cognitive Fusion Questionnaire (CFQ) and Schizotypal Trait Questionnaires (STB). There was a positive and significant relationship between cognitive fusion and borderline personality disorder (BPD) ($p<0.01$). The correlation between cognitive flexibility and borderline personality disorder and subscales was significant and negative ($p<0.01$, $p<0.05$). Cognitive flexibility and cognitive fusion and their subscales can predict the BPD factors. It is suggested that psychological interventions, especially cognitive-behavior therapy (CBT) and Acceptance and Commitment Therapy (ACT), are used to increase the cognitive flexibility and reduce cognitive fusion of students with borderline personality symptoms.

Keywords: Cognitive flexibility, Cognitive Fusion, Borderline personality Disorder.

Introduction

Borderline Personality Disorder (BPD) includes the pervasive pattern of the instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present different situations (1). The mean prevalence of BPD was estimated 1.6% in people although it might grow up to 5.%9. The prevalence is around 10% to 12% in outpatient psychiatric clinics, 20% to 22% among inpatient clinics (2) and in college samples it ranged from 0.5% to 32.1%, with a lifetime prevalence of 9.7% (3). The causes of this disorder are not clear yet, but the findings have indicated that genetic factors and negative life events play roles in forming this disorder (4). Researchers have increasingly emphasized the role of maladaptive cognition in the development and maintenance of this disorder (5-14).

An important construct of the cognitive-behavioral approach (CBT) is cognitive flexibility (CI). Cognitive flexibility is a concept that has been described as the salient

feature of human cognition. It refers to the individual capability for simultaneous consideration of contradicted representations of an object or event (15). Although there is no consensus on the definition of cognitive flexibility, the ability to switch cognitive set to adapt to changing environmental stimuli is a key element in the definitions of this concept (16). Some researchers also emphasize the extent to which a person assesses the controllability of the situations that vary with the situation (17-18). There is evidence that indicate that the cognitive flexibility is related to a wide range of psychological disorders (19-25). A research has studied the relationship between cognitive flexibility and personality disorder, especially obsessive-compulsive personality disorder. The results indicated that those who suffered obsessive-compulsive personality disorder had problems in the cognitive flexibility field (26). Few studies have been carried out about the relationship between borderline personality disorder and cognitive flexibility. Bolderston (2013) showed that CF mediated the relationships between negative affectivity and childhood trauma, and personality functioning in adulthood (27). In another study, Imani and Poorshabazi (2017) examined the role of three psychological flexibility components of acceptance and practice, values, and cognitive defusion (More general than cognitive flexibility) in predicting BDP (28). The findings showed that avoidance experience (lack of acceptance) was an important component in predicting BPD and it should be considered as one of the main purposes of treatment in these patients. Odac and Cikrikci (2018) showed that cognitive flexibility was a significant mediator in the relationship between personality traits and life satisfaction (29).

Cognitive fusion is another construct of Acceptance and Commitment Therapy (30-31) that has relationship with some psychological disorders. Cognitive fusion predomination of cognition on experiences, inability to perceive cognitive subject from different viewpoint, emotional reaction to thoughts, and behaviors are extremely modified by cognition, effort to control thoughts, overanalyzing situations, and evaluation and judgement of thoughts (32). Cognitive fusion is a process that plays a key role in most psychiatric disorders and Various researches have been conducted in supporting the harmful role of cognitive fusion as a basic process in the pathology of psychological disorders (31-40) Regarding effectiveness of ACT on BPD (41-43) and the importance of cognitive fusion and cognitive flexibility as the transdiagnostic constructs of cognitive-behavioral therapy and commitment and acceptance-based therapy and maintenance of most psychological disorders, this research aimed to study the relationship between cognitive flexibility and cognitive fusion with the borderline personality disorder symptoms in college students. Although these researches show the mediating role or the relationship between cognitive flexibility and cognitive fusion with psychiatric disorders, review of literature show that the relationship between cognitive flexibility and cognitive fusion with BPD symptoms has not been studied on the student. Finding this relationship can be helpful in the psychological treatments for student with BPD symptoms and clinical disorder.

Materials and Methods

This is a descriptive-cross sectional research registered with IR.sums.med.rec with the code of 1396.S772 by the Ethics Committee of Shiraz University of Medical Sciences.

This study recruited students of Mazandaran University of Medical Sciences through cluster sampling method in the 2017-2018 school year. There were 366 students who were initially invited to complete the questionnaires for the current study. However, there were 10 students who did not make a reasonable attempt to complete the questionnaires. As such, the final sample consisted of 356 students (69.2% female; mean age in years = 20.48, *SD* = 1.79).

After explaining the goal of research and obtaining consent of the subjects and by observing the ethics, cognitive flexibility (CFI), cognitive fusion(CFQ) and borderline personality(STB) questionnaires were distributed among 366 students of different faculties of Mazandaran University of Medical Sciences who were selected by cluster random sampling. First, five schools (health, pharmacy, paramedical sciences, medicine and dentistry)) were selected randomly from among all schools. Then, some students were selected from different majors. Subjects

participated with the informed consent in the research and completed cognitive flexibility Inventory (CFI), cognitive fusion questionnaire (CFQ) and schizotypal trait questionnaire (STB).

Cognitive Flexibility Inventory (CFI; Dennis & Vander Wal 2010): The 20-item CFI is used to measure a kind of cognitive flexibility, which is necessary for the success of an individual in challenging and replacing inefficient thoughts with efficient thoughts. The items of the CFI are rated on a 7-point Likert-type scale scored from 1(Strongly disagree) to 7(Strongly agree). CFI measured three aspects of cognitive flexibility control, alternatives, and alternatives for human behavior. This questionnaire has been used in the clinical and non-clinical work for evaluating the progress of an individual in developing flexible thinking in cognitive-behavioral therapy of depression and other psychological disorders. CFI has a good factor structure, convergent validity and concurrent validity, Cronbach alpha, and test-retest reliability (16). In Iran, Shareh, Farmani and Soltani (2014) reported test-retest and Cronbach alpha CFI of 0.71 and 90, respectively. CFI has also acceptable factor, convergent and concurrent validities. In Iran, despite the main scale in which only two factors were obtained, CFI has three factors of control perception, different items perception, and behavior explanation perception. The convergent validity was 0.67 with Connor and Davidson Resilience Scale (CD-RISC), and concurrent validity with Beck depression inventory (BDI-II) was -0.50 (44).

Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014): This questionnaire contains 7 questions, which are scored using Likert scale ranging from 0(never true) to 7 (completely true). Higher scores reflect higher cognitive fusion. Gillanders et al. (2014) presented evidence about factor structure, reliability, stability, differentiated validity and sensitivity to treatment (32). In Iran, the results of factor analysis with principal components showed a component that explained 54.89% of the variance. The relationship between CFQ with others constructs confirms the validity of CFQ. Cronabch alpha and test-retest of CFQ was 0.86 and 0.86, respectively (45).

Borderline Personality Scale: Schizotypal Trait Questionnaire – B form (STB; 46): STB was revised by Rawlings et al. (47) and Mohammadzade et al. (48); they created this scale with DSM-IV-TR and added 6 items to it in addition to the initial 18 items in order to cover the diagnostic criteria. Therefore, STB has 24 items scored as yes (1) and no (0). This scale measures three factors of hopelessness, impulsivity, and stress related dissociative and paranoid symptoms. Rawlings et al. have reported the Cronbach alpha of STB as 0.80. The concurrent validity of STB has been reported with neurosis and psychosis scales (EPQ) in the society as 0.64 and 0.44, respectively (47). Mohammadzade et al. (2006) reported STB test-retest validity as 0.84 and subscales of hopelessness, impulsivity, and stress related dissociative and paranoid symptoms as 0.53, 0.72 and 0.50, respectively. Cronbach alpha was 0.77 for the total scale and 0.64, 0.58, and 0.57 for the subscales, respectively (48).

Results

The participants were selected from among five schools of health, pharmacy, paramedical sciences, medicine and dentistry. Students were from anesthesiology (10.1%), laboratory sciences (7%), radiology (9.3%), health information technology (4.8%), occupational therapy (4.2%), medicine (27.8%), dentistry (3.1%), pharmaceutics (4.8%), public health (8.1%), environment health engineering (10.7%), and professional health engineering (10.1%) majors. 335 students were single and 21 were married. Academic GPA for 27.7% of the students was higher than 17, for 23.6% of students 12 to 17, and for 3% lower than 12 (except for the freshmen). 32.1% were in the first semester, 23% in the second semester, 6.7% in the third semester, 16.3% in the fourth semester, 3.9% in the fifth semester, 9.8% in the sixth semester, 2.5% in the seventh semester, and 5.1% in the eighth semester.

As shown in Table 1, the correlation between cognitive fusion and borderline personality disorder was positive and significant ($p<0.01$).

The correlation between cognitive fusion and hopelessness, impulsivity and stress-related dissociative and paranoid was significant and positive ($p<0.01$), indicating that by increasing cognitive fusion, borderline personality

disorder and subscales increase as well. The correlation between cognitive flexibility and borderline personality disorder was negative and significant ($p<0.01$). Also, the correlation between cognitive flexibility with hopelessness, impulsivity and stress-related dissociative and paranoid was significant and negative ($p<0.001$), indicating that higher cognitive flexibility scores were related to higher symptoms of BPD in students. There were also similar significant negative relationships between control, alternatives and alternatives for human behavior subscales and hopelessness, impulsivity and stress-related dissociative and paranoid ($p<0.01$). However, there was no significant correlation between alternatives and stress-related dissociative and paranoid ($p<0.05$). This correlation indicates that by increasing the tendency to perceive difficult situations as controllable, the ability to generate multiple alternative solutions to difficult situations and the ability to perceive multiple alternative explanations for life occurrences and human behaviors reduce the borderline personality symptoms of hopelessness, impulsivity and stress-related dissociative and paranoid behaviors.

Table 1: The correlation between cognitive flexibility subscales with borderline personality disorder subscales

Variables	STB	hopelessness	impulsivity	stress related dissociative and paranoid
Cognitive fusion	0.55**	**0.55****	**0.44****	**0.34****
Cognitive felexibility	-.28**	**-0.28****	**-0.22****	**-.16****
Control	-	-.13*	-.18*	-.14*
Alternatives	-	-.11*	-.12*	-.03
Alternatives for human behavior	-	-.27**	-.16**	- .14**

** p<0.01, * p<0.05

Multiple stepwise regressions were used to predict the borderline personality disorder subscales (hopelessness, impulsivity and stress related dissociative and paranoid) based on the cognitive fusion and cognitive flexibility (control, alternatives and alternatives for human behavior). As shown in Table 2, the results showed that cognitive fusions predicted only 25% of hopelessness subscale variance ($p<0.001$, $F=123.92$), 19% of impulsivity variance ($p<0.001$, $F=85.58$) and about 11% of stress-related dissociative and paranoid behaviors ($p<0.001$, $F=46.70$). The results of multiple regression analysis showed that cognitive flexibility subscales predicted 0.17% of the hopelessness variance ($p<0.05$, $F=6.04$), 33% of impulsivity variance ($p<0.01$, $F=12.04$), and 0.021% of stress- related dissociative and paranoid behaviors ($p<0.001$, $F=7.41$). Alternatives subscale predicted 0.014% of the hopelessness variance ($p<0.05$, $F=4.95$) and 0.016% of the impulsivity variance ($p<0.05$, $F=5.72$), but it could not predict stress-related dissociative and paranoid behaviors ($p>0.05$, $F=0.31$). Alternatives for human behavior subscale predicted 0.074% of the hopelessness variance ($p<0.001$, $F=28.31$), 0.027% of the impulsivity variance ($p<0.10$, $F=9.91$), and 0.009% of the stress-related dissociative and paranoid behaviors ($p<0.01$, $F=6.83$).

Table 2: The results of cognitive fusion regression analysis and cognitive flexibility subscales in predicting borderline personality disorder

Criterion variable	Predictive variables	B	SE	β	Sig	R^2
Hopelessness	Cognitive fusion	0.097	0.009	0.50	0.001	0.25
	Control	-.0.065	0.027	-.13	0.014	0.017
	Alternatives	-0.095	0.043	-0.11	0.026	0.014
	Alternatives for human behavior	-0.062	0.012	-.027	0.001	0.074
Impulsivity	Cognitive fusion	0.092	0.010	0.44	0.001	0.19
	Control	-.10	0.029	-.18	0.001	0.033
	Alternatives	-.11	0.047	-.13	0.017	0.016
	Alternatives for human behavior	-.041	0.013	-0.16	0.002	0.027
Stress related dissociative and paranoid	Cognitive fusion	0.050	0.007	0.34	0.001	0.11
	Control	-0.056	0.021	-0.14	0.007	0.021
	Alternatives	-0.019	0.033	-0.030	0.57	0.001
	Alternatives for human behavior	-0.024	0.009	-0.14	0.009	0.009

Discussion

This research aimed to determine the relationship between cognitive flexibility (and its components) and cognitive fusion with borderline personality disorder in students. The results indicated that cognitive flexibility and its subscales had inverse correlation with borderline personality disorder. In fact, these findings indicate that the higher the level of individual's flexibility in terms of cognition, the lower the symptom of borderline personality disorder, i.e. by increasing the cognitive flexibility, borderline personality disorder symptoms decrease. Results of this research were consistent with the studies which showed cognitive flexibility was related to psychiatric disorder (19-26, 44)

Results of this research are somewhat consistent with those of Past et al. (2016), showing that the individuals who suffer from obsessive-compulsive personality disorder have problem in cognitive flexibility (26). Cognitive flexibility, as an important feature, can help those who suffer different personality disorders, to find positive alternative solution in difficult conditions and deal with emotional excitations in an adaptive form (21.26). Considering the findings of previous research, we can infer that those with borderline personality disorder symptoms are not capable to explain some alternative solutions in encountering with life events, situations and behavior of people and they cannot think about

alternative solutions during difficult conditions. They cannot also consider difficult situations as controllable. One of the clinical implications of this research is that cognitive interventions, especially cognitive-behavioral therapy, that target the maladaptive cognitions can be helpful in reducing hopelessness and impulsivity of individuals with borderline personality disorder. Providing education about cognitive flexibility for these patients help them to perceive and control the stressful conditions in a positive form and seek more effective solutions for cognitive and emotional challenges they are faced with. Future research should be done on the relationship between cognitive flexibility and BPD. The results of the relationship between cognitive fusion and BPD indicate a positive and significant relationship. This finding is consistent with those of some studies (31-40). The relationship between cognitive fusion with borderline personality disorder and related disorders can be explained with acceptance and commitment therapy (ACT). Based on ACT, cognitive fusion was influenced by cognition and conformed to it. When cognitive fusion occurs, individuals' act based on thoughts, and cognitive events become dominant on the behavior and experience, compared to other behavior setting sources, and the sensitivity of an individual to direct consequences reduces. According to this view, those who experience cognitive fusion in practice are not able to see cognitive events from a different point of view, show emotional reaction to thoughts, try to control thoughts, and over-analyze a given situation (31.37-40). One of the treatment implications is that psychological interventions, including ACT, can help the individuals with borderline personality disorder to communicate more positively with the environment and other people in cognitive and emotional perspectives and take distance from their thoughts, so that they see them only as thoughts.

One limitation of this research was using self-reported questionnaires that may create bias in the responses. Another limitation of this research was that it was conducted on a sample of students and future researches can consider the relationship in the clinical samples. Regarding the results of this research, it is suggested that future researches and interventions deal with the relationship between cognitive flexibility variables and cognitive flexibility with personality and clinical disorders to provide new approaches for improving and promoting mental health.

Conflict of interest

Authors declare no conflict of interest.

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