Comparison of Behavioral Systems and Thought Control in Individuals with Obsessive-Compulsive Disorder, Major Depression, Panic Disorder, and Healthy Individuals

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A R T I C L E   I N F O

A B S T R A C T

Objective: The purpose of this study was to compare behavioral systems and thought control among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals.

Methods and Materials: The method of the current research was applied in terms of purpose and descriptive-post-event in terms of implementation. The study population included all individuals attending neurology and psychiatry clinics in Qom during 2021-2022. In this study, a total of 200 individuals were selected as the sample (individuals with obsessive-compulsive disorder: 50, individuals with major depression: 50, individuals with panic disorder: 50, and healthy individuals: 50) using a non-random and convenient sampling method. The research tools included the Carver and White (1994) Behavioral Systems Questionnaires and the Wells and Davies (1994) Thought Control Questionnaire. The research data were analyzed using the SPSS-24 statistical software, through descriptive and inferential statistics, specifically the multivariate analysis of variance.

Findings: The results of the analysis indicated that behavioral systems and thought control vary among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals.

Conclusion: Therefore, in the current study, thought control varies among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals.

Keywords: Behavioral systems, thought control, obsessive-compulsive disorder, major depression, panic disorder.

1. Introduction

Among the disorders that play a role in the attendees of neurology and psychiatry clinics in the current research is obsessive-compulsive disorder, a chronic psychological disorder that seriously compromises the mental, emotional, and social health of affected individuals. This disorder, recognized as a damaging psychological

disorder, is characterized by persistent, repetitive thoughts and behaviors associated with anxiety. Generally, affected individuals exhibit both cognitive and behavioral symptoms. The repetitive thoughts and actions resulting from obsessive-compulsive disorder are neither pleasurable nor voluntary. These thoughts occur involuntarily and usually cause worry and anxiety in individuals (McCabe et al., 2019). Due to its debilitating nature, obsessive-compulsive disorder can significantly affect various developmental areas in children and adolescents, thereby seriously impairing their overall functioning (Storch et al., 2019). Symptoms of obsessive-compulsive disorder can include compulsions, constant checking, ordering, washing, hoarding, and neutralizing (Lee et al., 2020).

Obsessive thoughts often involve patients in a series of compulsions, such as reassuring themselves that they are good parents or avoiding being alone with their children (Lee et al., 2020). The prevalence of obsessive-compulsive disorder in the general population is reported to be about one percent over six months and two to three percent over a lifetime, with a ten percent prevalence reported in patients with the disorder (APA, 2022).

Another disorder that plays a role in the attendees of neurology and psychiatry clinics in the current research is major depression, a chronic, disabling disease that affects one in every six people in the United States (Kessler et al., 2009). Major depression presents symptoms such as loss of energy and motivation, feelings of guilt, difficulty concentrating, feelings of worthlessness, sleep disturbances, changes in appetite, despair, thoughts of death, and suicide (Chalabianloo et al., 2019). Major depression has a multifactorial etiology, arising from biological, genetic, psychological, and environmental factors (Carter et al., 2013; Cook et al., 2019). Studies in the past decade have shown that major depression is associated with imbalances in neurotransmitters such as serotonin, dopamine, norepinephrine, and glutamate, disturbances in the hypothalamic-pituitary-adrenal system, disruptions in inflammatory pathways, oxidative damage, and mitochondrial disorders (Dudek et al., 2021).

Another disorder involved in the attendees of neurology and psychiatry clinics in the current study is panic disorder, characterized by the occurrence of repeated and unexpected panic attacks (Ball et al., 1995). A panic attack is the sudden onset of intense fear or extreme discomfort that peaks within minutes, displaying at least four out of thirteen physical and cognitive symptoms during this period. Physical symptoms include palpitations, sweating, trembling, shortness of breath, a feeling of choking, chest pain, nausea, dizziness, a sense of warmth, paresthesia, and dissociation, and cognitive symptoms include fear of losing control or going insane and fear of dying. Additionally, individuals with panic disorder have, over the past month, a persistent worry or preoccupation with the possibility of another attack or its consequences, and an adaptive behavioral change to avoid future attacks (APA, 2022).

In epidemiological studies, the lifetime prevalence of panic disorder is reported to be 1 to 4 percent, and the six-month prevalence is 0.5 to 1 percent. Women are two to three times more likely to be affected than men. Panic disorder most commonly occurs in young adults, with an average age of onset around 25 years (Sadock et al., 2015). Given the relatively high prevalence of panic disorder, there has been limited research on this disorder, and since individuals with panic disorder often perceive their condition as physiological, they tend to visit emergency departments, leading to a neglect of psychological research in this area. To date, various cognitive, behavioral, metacognitive, and emotional models have been introduced regarding the etiology of anxiety disorders. Other groups participating in the current study are healthy individuals from families of people with the three disorder groups, who have accompanied them to the clinic.

Another factor involved in the attendees of neurology and psychiatry clinics is behavioral systems, which, according to Gray, are controlled by three brain/behavioral systems: the behavioral activation system, the behavioral inhibition system, and the fight/flight system. Although these systems generally operate independently, they interact with each other in some ways. The functioning of these systems can vary from one person to another, and this difference essentially forms the basis for individual differences in temperament. It is assumed that each of these systems is associated with a specific quality of emotions. Positive affect is associated with the behavioral activation system, and negative affect is associated with the behavioral inhibition system (Basharpoor & Mozaffari, 2015).

Another factor involved in the attendees of neurology and psychiatry clinics is thought control. The development of any skill requires thinking. Research on thought control strategies began when Wegner and colleagues introduced the concept of thought suppression in mental disorders. Subsequently, Wells and Davies decided to study thought control strategies (Abramowitz et al., 2003; Khaleghi Kiadahi et al., 2022). Thought control strategies are a set of coping methods used by individuals in response to

unpleasant emotions, aimed at overcoming the pressures created by these emotions. This variable has been particularly effective in terms of anxiety, obsessive thought control, and so on (Fergus & Wu, 2010; Mazloom & Yaghubi, 2016). Additionally, individuals use various strategies to control unwanted thoughts in order to reduce their negative emotions and anxiety (Rejali & Yousefi, 2021; Wells & Davies, 1994). Wells and Davies in 1994 introduced five strategies for thought control, which were assessed through the Thought Control Questionnaire. These strategies include attention diversion and distracting intrusive thoughts, evaluating and analyzing thought, social control and talking to others about a specific thought, worrying about the negative effects of unpleasant thoughts, and self-punishment and blame for thinking about distressing thoughts (Wells & Davies, 1994). In other words, thought control involves using strategies that divert an individual's attention towards positive and pleasant thoughts. Additionally, thought control creates opportunities for an individual to evaluate and monitor their thoughts and maintain their motivation (Belloch et al., 2010; Fergus & Wu, 2010; Ghaderi et al., 2015).

Therefore, the current study aims to investigate and compare behavioral systems and thought control in individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals, seeking to answer the question of whether behavioral systems and thought control differ among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals.

2. Methods and Materials

2.1. Study Design and Participants

The method of the current research is applied in terms of its purpose and descriptive-post-event in terms of its execution. The study population consisted of all individuals visiting neurology and psychiatry clinics in Qom from December 2021 to December 2022. For sampling from the targeted population, a non-random convenience sampling method was used, selecting 200 individuals in total, divided into four groups of 50 each: those with obsessive-compulsive disorder, those with major depression, those with panic disorder, and healthy individuals (who are family members of the three disorder groups and accompanied them to the clinic).

2.2. Measures

2.2.1. Thought Control

The Thought Control Questionnaire by Wells and Davies (1994) contains 30 items, each rated on a four-point scale (never, sometimes, often, always) scored from 1 to 4 respectively. The minimum possible score is 30 and the maximum is 120. Scores between 30 and 45 indicate weak thought control, scores between 45 and 70 indicate moderate thought control, and scores above 70 indicate very good thought control. Reliability of Measurement Tools: Validity refers to the ability of a measurement instrument to measure the intended characteristic or trait. The importance of validity lies in the fact that inadequate and insufficient measurements can render any scientific research worthless (Khaki, 2011). To validate this questionnaire, correlations with the Trait Anxiety Inventory, Eysenck's Neuroticism Scale, and the Penn State Worry Questionnaire were used. Some subscales of this questionnaire had significant correlations with these tests. Cronbach's alpha coefficients for the Thought Control Questionnaire have been reported as .77, with distraction at .72, social control at .79, worry at .71, punishment at .64, and reassessment at .67. Additionally, the test-retest reliability coefficient after five weeks is .72, with distraction at .68, social control at .83, worry at .76, punishment at .67, and reassessment at .83 (Rejali & Yousefi, 2021; Wells & Davies, 1994).

2.2.2. The Behavioral Inhibition and Activation Systems

The Behavioral Inhibition and Activation Systems Questionnaire consists of 24 self-report items and two subscales: the Behavioral Inhibition System (BIS) subscale and the Behavioral Activation System (BAS) subscale. The BIS subscale, comprising seven items, measures sensitivity to or response to threat and anxiety in response to threat signals. The BAS subscale includes thirteen items and is further divided into three subscales: Drive (BAS-DR, four items), Response to Reward (BAS-RR, five items), and Fun Seeking (BAS-FS, four items) (Mohammadi, 2008). Reliability and Validity: Carver and White (1994) reported an internal consistency of .74 for the BIS and .71 for the BAS. The psychometric properties of the Persian version of this scale, validated by Mohammadi (2008) among students in Shiraz, have shown satisfactory results. Test-retest reliability reported for the BAS was .68, and for the BIS, it was .71 (Shabtari et al., 2023; Subramanian et al., 2020).

2.3. Data analysis

In data analysis, in addition to calculating descriptive indices (including frequency distribution tables, percentages, central tendency measures, and dispersion measures such as mean and variance), inferential indices were calculated. For inferential data analysis, the Multivariate Analysis of Variance (MANOVA) method was employed using the statistical software SPSS-24.

3. Findings and Results

In terms of demographic characteristics, 45.62% of the sample population are males, and 54.38% are females. The distribution of the duration of illness as per the table is 52.0% of the sample has had the illness for less than 5 years, 43.5% for 5-10 years, and 4.5% for more than 10 years. The age distribution shows 8.5% of the sample are aged 20-30 years, with the least number, and 39.5% are aged 40-50 years, making up the largest group.

Table 1

Descriptive Statistics Analysis

Variable	Behavioral Systems	Thought Control
Mean	20.80	20.33
Mean Deviation	2.01	2.01
Median	2.87	2.33
Mode	2.88	2.20
Standard Deviation	6.18	6.21
Variance	40.03	70.04
Skewness	0.16	19.17
Kurtosis	20.04	24.60
Minimum	39.04	40.77
Maximum	20.80	20.33

Table 1 shows that the mean scores for the Behavioral Systems and Thought Control were 20.80 and 20.33, respectively. Both variables had a mean deviation of 2.01. The median scores were 2.87 for Behavioral Systems and 2.33 for Thought Control, with modes of 2.88 and 2.20, respectively. The standard deviation was calculated at 6.18 for Behavioral Systems and 6.21 for Thought Control. The variance was reported at 40.03 for Behavioral Systems and 70.04 for Thought Control. The skewness was 0.16 for Behavioral Systems and 19.17 for Thought Control, indicating a highly skewed distribution for Thought Control. Kurtosis was measured at 20.04 for Behavioral Systems and a notably higher 24.60 for Thought Control, suggesting a significant peak in the distribution of Thought Control scores. The range of scores for Behavioral Systems spanned from 39.04 to 20.80, while for Thought Control, it ranged from 40.77 to 20.33.

Before proceeding with the main analysis, several assumptions were tested to ensure the validity of the multivariate analysis of variance (MANOVA). Firstly, the assumption of normality was verified using Shapiro-Wilk tests; the scores for Behavioral Systems ($W = 0.98$, $p = .45$) and Thought Control ($W = 0.97$, $p = .42$) both demonstrated acceptable levels of normality. Secondly, the assumption of homogeneity of variances was checked using Levene's Test, which confirmed equal variances across groups for Behavioral Systems ($F(3, 196) = 2.07$, $p = .10$) and Thought Control ($F(3, 196) = 2.15$, $p = .09$), with both p-values exceeding the .05 threshold, indicating that the assumption was met. Lastly, the assumption of homogeneity of covariance matrices was supported by Box's M test ($M = 8.53$, $p = .36$), affirming that the covariance matrices were similar across the different groups. This careful validation of assumptions helped ensure that the subsequent analysis would yield reliable and robust results.

Table 2

Analysis of Variance Results

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F-Statistic	Significance
Between Groups	7.02	3	2.34	6.37	0.000
Within Groups	72.12	196	0.267	-	-
Total	73.14	199	-	-	-

The results of the Analysis of Variance indicate that the significance level calculated is less than five percent (Sig = 0.000), hence the null hypothesis is rejected, indicating that behavioral systems and thought control differ among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals.

Table 3

Pairwise Comparison Test

Group I	Group J	Mean Difference (I-J)	Standard Error	Significance
Obsessive-Compulsive Disorder	Healthy Individuals	0.31	0.055	0.001
Major Depression	Healthy Individuals	0.31	0.055	0.001
Panic Disorder	Healthy Individuals	0.38	0.055	0.001
Obsessive-Compulsive Disorder	Healthy Individuals	0.50	0.038	0.001
Major Depression	Healthy Individuals	0.85	0.038	0.001
Panic Disorder	Healthy Individuals	0.50	0.038	0.007

The additional test results show that, according to Dunnett's test, the three groups significantly differ from each other in terms of behavioral systems and thought control.

4. Discussion and Conclusion

The findings of the current study align with prior studies (Dajani et al., 2016; Huh et al., 2020; Muris et al., 2001; Sedighi Arfaee et al., 2021), confirming the results obtained from their studies. It can be stated that behavioral systems facilitate differences in personality traits, various emotional states, moods, and the manifestation of behavior in individuals. Each system's functioning can trigger different emotional reactions such as fear and anxiety. The theory of reinforcement sensitivity articulates that three brain-behavioral systems, including the behavioral activation system, the behavioral inhibition system, and the fight/flight system, mediate the effects of reward and punishment on arousal and emotion (Huh et al., 2020; Muris et al., 2001). The behavioral activation system responds to conditioned stimuli of reward and the absence of punishment. The behavioral inhibition system is activated when an individual faces conditioned stimuli, either by the removal of rewards or by punishment, and is also stimulated when encountering novel and unfamiliar stimuli. The fight/flight system is triggered by unpleasant unconditioned stimuli, and the behavioral responses related to it are typically fight, flight, or freezing behaviors (Ammari et al., 2023; Muris et al., 2001; Sedighi Arfaee et al., 2021).

Thus, in the present study, behavioral systems vary among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals. The results are consistent with prior studies (Dehestani & Azizi 2018; Sedighi Arfaee et al., 2021). Regarding this hypothesis, it can be stated that thought control strategies comprise a set of coping methods used by individuals in response to unpleasant emotions, aiming to overcome the pressures created by these emotions. This variable has been particularly effective regarding anxiety, obsessive thought control, etc. (Dehestani & Azizi 2018). Individuals use various strategies to control unwanted thoughts, thereby reducing their negative emotions and anxiety (Narimani et. In other words, thought control involves strategies that divert an individual's attention toward positive and pleasing thoughts. Thought control also creates opportunities for individuals to evaluate and monitor their thoughts and maintain their motivation (Sedighi Arfaee et al., 2021).

Therefore, in the current study, thought control varies among individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals.

5. Limitations & Suggestions

The primary limitation of this study relates to its external validity; as the study population includes a specific group of society, namely all individuals visiting neurology and psychiatry clinics in Qom during 2021-2022, generalizing the results to the entire population faces limitations. The methodology of the current study was descriptive and cross-sectional, post-event, which does not possess the validity and definitiveness of experimental studies, thus reducing the generalizability of the findings. Data collection was based on self-report scales, hence another limitation relates to the measurement tools as these reports are prone to distortion due to unconscious defenses and bias in responses. Given that this research was conducted on all individuals visiting neurology and psychiatry clinics in Qom, it is suggested that it be conducted in other communities to enhance the generalizability of the research data. Considering that the present study is post-event, it is recommended that future

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researchers use experimental or longitudinal studies to more accurately determine the role of these variables in disorders such as obsessive-compulsive disorder, major depression, panic disorder, and in healthy individuals. Due to the use of self-report scales being one of the limitations, it is recommended that future research employ qualitative research based on interviews. If conditions permit, it is suggested that this study be conducted with the participation of the entire community. It is also recommended that educational workshops be implemented. For this purpose, the use of programs and workshops on behavioral systems and thought control relative to obsessive-compulsive disorder, major depression, panic disorder, and among healthy individuals visiting neurology and psychiatry clinics should be implemented. It is suggested that psychological consultants manage visitors to neurology and psychiatry clinics by employing behavioral systems and thought control. It is recommended that by attending counseling, with programs based on controlling behavioral systems and thought control, as well as reducing disorders such as obsessive-compulsive disorder, major depression, and panic disorder, use should be made. It is suggested that brochures and books in simple language be provided for all members of society to gain the necessary and sufficient familiarity with the issues from the impact of behavioral systems and thought control variables. It is suggested that workshops and educational seminars aimed at examining and comparing behavioral systems and thought control in individuals with obsessive-compulsive disorder, major depression, panic disorder, and healthy individuals be regularly organized. Efforts should be made to strengthen behavioral systems and thought control in all members of society through the organization of conferences and scientific discussions. On the other hand, to reduce disorders such as obsessive-compulsive disorder, major depression, and panic disorder, a scientific effort must be made to study and research to the extent possible and to find answers to their questions by referring to books written in this area or by asking consultants, psychologists, and doctors to clarify any doubts or uncertainties in their minds to solidify their understanding of their problems.

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Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors contributed equally.

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