



Maladaptive schemas, behavioral activation-inhibition systems, and experiential avoidance in patients with chronic somatic symptom disorders and healthy people

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Original Article

Abstract

BACKGROUND: Somatic symptom disorders have relation with mental health. Hence, this study aimed to compare early maladaptive schemas (EMSs), behavioral activation system/behavioral inhibition system (BAS/BIS), and experiential avoidance in patients with chronic somatic symptom disorders and healthy people.

METHODS: This was a casual-comparative study. Of patients with psychosomatic disorders referring to the Palliative Medicine Center and Educational and Medical Center of Shahid Sayyad Shirazi in Gorgan, Iran, 120 eligible patients were selected through convenience sampling, then were compared with 120 normal individuals (without psychosomatic disorders) who had been matched with patient group in terms of age, sex, education, and marital status. Brain Behavioral System Questionnaire (BAS/BIS Questionnaire), Young Schema Questionnaire-Short Form (YSQ-SF), and Acceptance and Action Questionnaire-II (AAQ-II) were used. The data were analyzed by multivariate analysis of variance (MANOVA) and SPSS software.

RESULTS: Demographic information of patient and healthy groups indicated that in patient group, 36.7% were single and 63.3% were married, 1.7% had elementary education, 10.0% had secondary school education, 45.0% had diploma, and 43.3% had higher education degree. In normal group, 60.0% were single and 40.0% were married, 3.3% had secondary school degree, 51.7% had diploma, and 45.0% had higher education degree. The results indicated a significant difference between EMSs, behavioral systems, and experiential avoidance in patients with somatic symptom disorders and normal people in Iran ($P < 0.001$).

CONCLUSION: Patients with somatic symptom disorders have more active BAS-BIS, high EMSs, and more experiential avoidance than normal people.

KEYWORDS: Body Schema; Behavioral Control; Inhibition

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Introduction

Chronic pain is a severe biopsychosocial problem worldwide. It has a severe negative impact on people's normal performance and

engagement in social relationship. Chronic pain also has a negative impact on psychological health, such as depression, anxiety, and stress.¹

Some factors could have an influence on adjustment to chronic pain that stress is one of them. Moreover, two neurophysiological systems could facilitate approach and avoidance behaviors, including behavioral

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inhibition system (BIS) and behavioral activation system (BAS).²

Early maladaptive schemas (EMSs) are beliefs about ourselves that encompass physical, cognitive, and emotional components. Such schemas are created because of unsatisfied emotional needs in childhood like affection, self-autonomy, competency, and loss of realistic limits.³ In fact, dysfunctional schemas are self-destructive and cognitive patterns and they could play a vital role in incidence of psychiatric disorders like anxiety, depression, drug abuse, and psychosomatic disorders.⁴

Saariaho et al. in their studies on patients with chronic pain indicated that more than half of patients with psychological symptoms had EMSs.⁵

Gray's Reinforcement Sensitivity Theory (RST) describes the BIS and BAS as neuropsychological systems that are activated in an automatic way in environmental or internal cues. Specifically, this theory hypothesizes that BIS is activated due to cues indicating the potential punishment. This system facilitates avoidance-related behaviors (e.g., withdrawal), negative emotions (e.g., fear), and cognitions (e.g., catastrophizing). On the other hand, BAS is activated in the presence of cues indicating the potential for reinforcement or the disappearance/omission of an expected negative stimulus. BAS activation facilitates approach-related behaviors (e.g., more activity, impulsivity) and emotions (e.g., excitement).^{6,7}

Patients with BIS repress their emotions and could not confront with them. They prefer to use avoidance strategies for escape from negative emotions experience.⁸

Experiential avoidance is one another factor causing psychosomatic disorders.⁹ As a coping strategy, experiential avoidance has an adaptive or maladaptive effect on a person's health.¹⁰ In fact, experiential avoidance or escaping from negative emotions is the main core of psychosomatic disorders.⁹ Many

studies showed that psychosomatic disorders and psychiatric disorders were highly correlated to experiential avoidance.¹¹

According to the importance of behavioral systems and some factors such as EMSs and experiential avoidance in type and severity of psychosomatic diseases, this study was conducted to compare BIS and BAS, EMSs, and experiential avoidance in patients with chronic somatic symptom disorder and healthy people.

Materials and Methods

This was a casual-comparative study. Of patients with psychosomatic disorders referring to the Center for the Support of Cancer Patients and Treatment (Palliative Medicine Center) and Educational and Medical Center of Shahid Sayyad Shirazi in Gorgan, Iran, 120 eligible patients were selected through convenience sampling and then were compared with 120 normal individuals (without psychosomatic disorders) who had been matched with patient group in terms of age, sex, education, and marital status.

Inclusion criteria included having at least elementary education, receiving diagnosis of somatic disorders by physician for at least 2 years, willingness to participate in this study, lack of acute physical or mental disorders, and non-use of psychotherapeutic drugs. Exclusion criteria were suffering from severe psychiatric disorders, drug abuse, alcohol consumption, and lack of willingness to participate in study.

Participants filled out Brain Behavioral System (BAS/BIS) Questionnaire, Young Schema Questionnaire-Short Form (YSQ-SF), and Acceptance and Action Questionnaire-II (AAQ-II) in baseline and the post intervention. The data were analyzed by multivariate analysis of variance (MANOVA) through SPSS software (version 20, IBM Corporation, Armonk, NY, USA).

BAS/BIS Questionnaire: This questionnaire was designed by Carver and White to evaluate personal differences in sensitivity of BAS and

BIS.¹² This scale consists of 20 items in which BIS is evaluated using subscale of reward responsiveness and BAS is evaluated by three subscales of award responsiveness, drive, and fun seeking. The internal stability of behavioral inhibition is reported as 0.72 and obtained its differential validity with anxiety equal to 0.55. In another study, Cronbach's alpha coefficient of inhibition and activation subscales was obtained to be 0.78 and 0.81, respectively.¹³ In Iran, Abdollahi et al. reported validity of this questionnaire to be 0.78 and 0.81 for BAS and BIS, respectively, using retest method.¹⁴ Basharpour et al. reported Cronbach's alpha coefficient of subscales of this questionnaire at range of 0.65-0.93.¹⁵

YSQ-SF: Original version of YSQ was designed by Young to measure EMSs. Moreover, short form of schema questionnaire (SQ-SF) was prepared to measure 15 EMSs based on the original form. Long form includes 205 items and short form includes 75 items. The SQ-SF was designed to evaluate EMS. In extant study, YSQ-SF (75-item) was used to examine EMSs measuring 15 EMSs within 5 scopes. Various studies have proved its factor structure and construct validity.¹⁶

In Iran, the validity of this questionnaire using Cronbach's alpha coefficient for the whole questionnaire was obtained to be 0.94, then this rate was obtained to be 0.91, 0.90, 0.90, 0.67, and 0.78 for 5 scopes of abandonment, impaired autonomy of a performance, impaired limits, other-directness, and over-vigilance and inhibition, respectively. This coefficient was obtained at range of 0.55-0.89 for schemas' domains.^{17,18}

AAQ-II: The original version of this questionnaire included 32 items scored at a 7-point Likert scale. The next versions consist of 16 and 9 items and the last form includes 10 items scored at a 7-point Likert scale. This questionnaire measures acceptance, experiential avoidance, and lack of psychological flexibility. Results obtained from

the study which was conducted on 2816 participants assigned in 6 samples indicated satisfying validity, reliability, and construct validity of this instrument. Mean of alpha coefficient was obtained to be 0.84 (0.78-0.88) and retest reliability was obtained to be 0.81 and 0.79 within 3 and 12 months, respectively.¹⁹ In addition, the validity of Iranian version of this scale is 0.89.²⁰

Results

Demographic data of patients and normal people are described in table 1. In this research, 120 patients with chronic psychosomatic (40% men and 60% women) were compared to 120 normal people (30% men and 70% women). According to demographic data of patients and normal people, 36.7% were single, 63.3% were married, 1.7% had elementary education, 10.0% had secondary school degree, 45.0% had diploma, and 43.3% had academic education in patient group. In normal group, 60.0% were single and 40.0% were married, 3.3% had secondary education, 51.7% had diploma, and 45.0% had academic education.

In table 1, mean and standard deviation (SD) of patients and normal people are indicated considering variables of BIS/BAS, cognitive avoidance, and EMSs. As it can be seen, patients obtained higher mean scores of inhibition systems, cognitive avoidance, and EMSs compared to normal people.

Before using parametric test (MANOVA), Kolmogorov-Smirnov test was used to test normality of data and Levene's test was employed to test variance heterogeneity in two groups. Since the obtained results from Kolmogorov-Smirnov test in variables of BIS, BAS, and cognitive avoidance were above 0.050 ($P < 0.050$), null hypothesis about normal variables in studied groups was accepted. In general, normality test has been observed in variable of Young's schemas and total score of Young's schemas ($P < 0.050$).

Table 1. Mean and standard deviation (SD) of behavioral inhibition system/behavioral activation system (BIS/BAS), cognitive avoidance, and early maladaptive schemas (EMSs) in patients with somatic symptom disorder and normal people

Variable	Components	Patient group (mean ± SD)	Normal group (mean ± SD)
BIS		20.00 ± 2.98	18.30 ± 3.00
	Drive	9.20 ± 2.10	9.80 ± 3.00
	Fun seeking	9.25 ± 2.20	9.40 ± 2.20
	Reward responsiveness	13.47 ± 2.80	14.30 ± 2.30
Experiential avoidance		45.40 ± 11.60	33.60 ± 10.40
EMSs	Emotional deprivation	15.20 ± 7.80	11.90 ± 6.80
	Abandonment	19.60 ± 6.40	13.20 ± 6.60
	Mistrust/mistreat	16.20 ± 7.70	11.40 ± 6.00
	Social isolation/alienation	14.10 ± 7.60	9.70 ± 4.90
	Defect/shame	11.40 ± 6.90	7.70 ± 4.10
	Failure	13.60 ± 7.20	8.90 ± 5.20
	Dependence/incompetency	12.70 ± 7.00	8.60 ± 5.10
	Vulnerability to harm and illness	15.90 ± 7.30	9.50 ± 5.50
	Directedness	15.00 ± 6.50	9.90 ± 5.10
	Subjugation	16.00 ± 8.10	9.60 ± 5.50
	Self-sacrifice	21.20 ± 5.70	17.80 ± 6.60
	Emotional inhibition	17.20 ± 7.00	11.60 ± 5.60
	Unrelenting standards	21.40 ± 5.40	19.30 ± 6.00
	Entitlement	17.80 ± 6.20	16.00 ± 5.10
Insufficient self-control	18.10 ± 6.40	14.00 ± 4.70	

BIS: Behavioral inhibition system; BAS: Behavioral activation system; EMS: Early maladaptive schema; SD: Standard deviation

Results related to Levene's test indicated that assumption of heterogeneous variances in studied groups was accepted at significance level of $P > 0.050$ in terms of variables including BIS, fun seeking, reward responsiveness, BAS, cognitive avoidance, emotional deprivation, abandonment, directedness, self-sacrifice, emotional inhibition, unrelenting standards, entitlement, and total score of Young's schemas. But the component of BAS drive ($P = 0.005$) and components of mistrust/mistreat, social isolation/alienation, defectiveness/shame, failure, dependence/incompetency, vulnerability to harm and illness, subjugation, and insufficient self-control did not observe

the variance heterogeneity in studied groups at significance level ($P \leq 0.050$).

According to results of independent t-test for both normal and patient's groups, there was a significant difference between means of BIS in the group of patients with psychosomatic disorders and normal people ($t = 3.1$, $P = 0.002$). These results imply that mean of inhibition system of patients with psychosomatic disorders was significantly higher than normal people. In addition, there was a significant difference between total scores of Young's schemas in studied groups ($t = 4.7$, $P = 0.001$) and mean score of Young's schema in patients' group was significantly higher than normal people (Table 2).

Table 2. The comparison between behavioral inhibition system (BIS), experiential avoidance, and early maladaptive schemas (EMSs) in patients and normal people

Variable	Patient group (mean ± SD)	Normal group (mean ± SD)	t	df	P
BIS	20.00 ± 2.98	18.30 ± 3.00	3.1	118.0	0.002
Cognitive avoidance	45.40 ± 11.60	33.60 ± 10.40	5.9	118.0	0.001
Total score of Young's schemas	255.30 ± 112.60	179.80 ± 55.00	4.7	85.7	0.001

BIS: Behavioral inhibition system; SD: Standard deviation; df: Degree of freedom

Table 3. The behavioral system's scores and early maladaptive schemas (EMSs) in two groups of patients and normal people [multivariate analysis of covariance (MANCOVA)]

Variables	df	Mean squares	F	P	Eta square
BAS					
Drive	1	10.80	1.59	0.209	10.800
Fun seeking	1	0.53	0.11	0.738	0.530
Reward responsiveness	1	20.80	3.26	0.073	20.800
Young's schemas					
Abandonment	1	323.40	6.00*	0.015	0.049
Mistrust/mistreat	1	1203.30	28.50**	< 0.001	0.195
Social isolation/alienation	1	686.40	14.38**	< 0.001	0.109
Defect/shame	1	580.80	14.30**	< 0.001	0.108
Failure	1	403.30	12.50**	0.001	0.096
Dependence/incompetency	1	662.70	16.80**	< 0.001	0.125
Vulnerability to harm and illness	1	500.20	13.20**	< 0.001	0.100
Directedness	1	1209.70	28.70**	< 0.001	0.196
Subjugation	1	780.30	22.80**	< 0.001	0.162
Self-sacrifice	1	1228.80	25.70**	< 0.001	0.179
Emotional inhibition	1	333.30	8.80**	0.004	0.070
Unrelenting standards	1	940.80	22.40**	< 0.001	0.179
Entitlement	1	130.20	3.90*	0.049	0.033
Insufficient self-control	1	99.00	3.10	0.080	0.026
Abandonment	1	396.00	12.50**	0.001	

BAS: Behavioral activation system; df: Degree of freedom

*: $P < 0.05$; **: $P < 0.01$

However, there was not any significant difference between two groups of patients and normal people in terms of experiential avoidance ($t = 5.9$, $P = 0.001$). In other words, mean scores of patients with psychosomatic disorders in terms of experiential avoidance were significantly higher than normal people (Table 2).

The results obtained from multivariate analysis of covariance (MANCOVA) (Table 3) showed a significant difference between two patient and normal groups in terms of EMSs including emotional deprivation, abandonment, mistrust/mistreat, social isolation/alienation, defectiveness/shame, failure, dependence/incompetency, vulnerability to harm and illness, directedness, subjugation, self-sacrifice, emotional inhibition, unrelenting standards, and insufficient self-control, except for entitlement ($P < 0.005$), while there was not any significant difference between them regarding components of BAS ($P > 0.005$).

Discussion

The results of current study showed that there

was a significant difference between patients with chronic somatic symptom disorders and normal people considering EMSs, BAS/BIS, and experiential avoidance. It means that inhibition system in patients with somatic symptom disorders is significantly more active compared with normal people. These results were in line with a study conducted in Iran which showed that inhibition system in patients with somatic symptom disorders was active.²¹ Another study showed that there was a relation between BIS and BAS with anxiety. This study showed that anxiety disorders were positively associated with reinforcement sensitivity, while negatively associated with BAS.²²

The BIS-BAS model of chronic pain hypothesizes that the two systems are distinct, but they are independent; thus, this model shows that significant BIS-BAS interactions predicting function might be found in many studies. Even though pain could activate primarily BIS, but it may influence BAS by two mechanisms. First, because BIS activation is hypothesized to inhibit BAS a little (but not completely), and pain may activate aggression

behaviours (a BAS “approach” response), an increased pain could result in an increase in BAS activation in some situations and with some individuals.² The combination of these two contradictory effects may induce a global association between pain and BAS activity. Thus, the BIS-BAS model of pain shows that experience of pain would result in more behavioral inhibition and less activity and positive emotions.² A greater tendency for engaging in approach behaviors, feeling of excitement, and believing that one is capable of controlling pain could inhibit (although not necessarily completely remove) a tendency for avoiding activities, fear, or having helplessness. With respect to a possible BIS X BAS interaction effect, the BIS-BAS model of chronic pain hypothesizes that this interaction is possible in some samples. Some research provides strong support for a BIS-BAS model in chronic pain.⁶ BIS has a moderate correlation between pain-related cognitions and psychological health. In addition, patients with chronic pain and more BIS responding evidence have more anxiety and depressive symptoms than those who have less BIS response.⁷

Moreover, dysfunction and inconsistency in each of brain/behavioral systems or their interaction may lead to psychological problems such as anxiety, depression, stress, and pain,^{6,7} so that it may play a role as a significant risk factor in different kinds of physical and psychological disorders such as psychosomatic disorders.

The results of our study showed that there was not a significant difference between components of BAS in two groups of patients and normal people; this result was not in line with some studies.^{23,24}

One another result of this study is a significant relationship between EMSs in people with psychosomatic disorders. In this regard, a study showed that EMSs including abandonment/instability, emotional deprivation, mistrust/mistreat, defectiveness/

shame, incompetency/dependence, vulnerability to harm or illness, subjugation, acceptance seeking/attention drawing, unrelenting standards, negative orientation/pessimism, and punishment are prevalent in patients with psychosomatic disorders.²⁵

In addition, this study showed that experiential avoidance was a critical issue in psychosomatic patients. Experiential avoidance could make the individual vulnerable to repression of negative emotions. The repressed negative emotion could prone people to psychosomatic disorders. These results are in line with results of some studies in Iran and the other countries.^{6,7,15}

Conclusion

The results of current study showed that behavioral systems, EMSs, and experiential avoidance were prevalent in patients with psychosomatic disorders. According to the findings of current study, such an issue can have either preventive outcomes or considerable psychological implications in treatment.

Conflict of Interests

Authors have no conflict of interests.

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