



A COMPARISON OF EARLY MALADAPTIVE SCHEMAS, EMOTIONAL EXPRESSIVITY, AND ANXIETY SENSITIVITY IN PATIENTS WITH PANIC DISORDER AND HEALTHY INDIVIDUALS

Seyed Arian Mousavi*

¹Department of Psychology, Faculty of Humanities, North Tehran Branch, Islamic Azad University, Tehran, Iran

Corresponding Author: Seyed Arian Mousavi

ABSTRACT

The present study aimed to compare early maladaptive schemas, emotional expressivity, and anxiety sensitivity between patients with panic disorder and healthy individuals. This comparative study involved two groups of 30 participants each, consisting of patients with panic disorder and healthy individuals, selected through convenience sampling. The instruments used in this research included the Young Schema Questionnaire (1994), the King and Emmons Emotional Expressivity Questionnaire (1990), the Liebowitz Social Anxiety Scale (1984), and the Taylor and Cox Anxiety Sensitivity Index (1998). Data were analyzed using both descriptive statistics (mean and standard deviation) and inferential statistics through Multivariate Analysis of Variance (MANOVA), conducted with SPSS software version 22. The results indicated that individuals with panic disorder exhibit higher levels of early maladaptive schemas and anxiety sensitivity compared to healthy individuals, and they also show distinct patterns of emotional expressivity. These differences suggest that early maladaptive schemas and anxiety sensitivity significantly contribute to increased vulnerability to panic disorder. The findings may inform the development of more effective therapeutic strategies and psychological interventions for individuals with panic disorder. This study enhances our understanding of the psychological differences between patients with panic disorder and healthy individuals and may serve as a foundation for designing improved therapeutic interventions.

Keywords: Emotional expressivity, Panic disorder, Anxiety sensitivity, early maladaptive schemas.

INTRODUCTION

Anxiety disorders are among the most prevalent psychiatric conditions. These disorders, particularly panic disorder, often have significant comorbidity with other psychiatric disorders, which can lead to substantial impairment in daily life (Bernstein & Gursky, 2020). Panic disorder is characterized by sudden and intense episodes of anxiety, which may occur in certain individuals, especially during times of high stress or fear. A panic attack is a response to stressful situations, differing from other bodily reactions to stress primarily in its intensity and symptoms (Efron & Wootton, 2021). It consists of a sudden period of intense fear that temporarily disrupts normal activities. These attacks typically begin unexpectedly and are often triggered by a disturbing or frightening external event. While panic attacks tend to evoke strong feelings of fear and distress, they are a result of the body's evolutionary fight-or-flight mechanism (Na & Cho, 2021). In the case of panic disorder, factors such as early maladaptive schemas, anxiety sensitivity, and emotional expressivity play a significant role in understanding the development and persistence of the condition. Individuals with panic disorder differ from healthy individuals in certain psychological characteristics. In this study, three variables—early maladaptive schemas, Emotional Expressivity, and anxiety sensitivity—will be compared between patients with panic disorder and healthy individuals.

Early maladaptive schemas are harmful emotional and cognitive patterns that develop early in life and continue to be repeated throughout an individual's life. These schemas, along with the dysfunctional coping strategies patients learn to interact with others, often serve as the foundation for symptoms of disorders such as depression. In schema therapy, change is emphasized because it represents a shift in lifestyle. One of the key therapeutic approaches in schema therapy is the use of experiential techniques, which are particularly effective in transforming schemas. Through these techniques, patients can connect their cognitive understanding of the inaccuracy of their schemas with emotional experiences (Amani et al., 2017). For instance, Nadri et al. (2023) have indicated that early maladaptive schemas create specific vulnerabilities to various psychological disturbances and personality issues. These schemas also affect how individuals perceive phenomena and shape their psychological functioning, potentially leading to both psychological and social harm. Additionally, these schemas are central to personality pathology and psychological impairments such as personality disorders, anxiety disorders, and interpersonal difficulties (Chahrahi et al., 2023). Therefore, recognizing early maladaptive schemas in individuals with anxiety disorders and panic disorder, and assisting in altering these schemas, can be beneficial.

Ghasemian-Nejad and Tabatabai (2023) explained that individuals who have faced numerous negative experiences in unpredictable situations may develop maladaptive schemas regarding their inability to handle unknown circumstances. When encountering new or unfamiliar situations, these schemas may trigger a panic response. Additionally, negative thoughts and maladaptive thinking can lead individuals toward panic and worsen the situation. Those with negative thoughts may quickly focus on perceived threats and their vulnerabilities, leading them to feel incapable of coping with the situation. Another variable we will examine is emotional expressivity. Emotional expressivity, as a key component of emotions, refers to the outward display of emotion, regardless of its value (positive or negative) or mode (facial, verbal, or behavioral). According to Lewis (2010), emotional expressions lead to observable, surface-level changes in the face, voice, body, and activity levels. Some individuals express their emotions freely and without concern for the consequences, displaying a style of emotional expressivity. Others tend to restrain their emotional responses, exhibiting a style of emotional inhibition. Emotional expressivity consists of three fundamental dimensions: positive emotional expression, negative emotional expression, and the expression of intimacy. Research has indicated that emotional expression styles are associated with physical and psychological health outcomes. Individuals who have difficulty expressing their emotions often struggle to recognize and articulate their feelings. It seems that people with panic disorder also face

challenges in emotional expressivity, which affects their functioning and relationships. Thus, investigating emotional expressivity in individuals with panic disorder could provide valuable insights into their emotional challenges (Hadi-Zadeh et al., 2020).

Emotional expressivity can act as a means to alleviate stress and anxiety. When individuals encounter stressful or panic-inducing situations and open up about their feelings, this expressiveness can help calm their minds and ease their emotions (Lahast et al., 2016).

Hadi-Zadeh et al. (2020) suggested that emotional expressivity enables individuals to confront and accept their negative and panic-related emotions. This ability to acknowledge and express emotions can help individuals cope more effectively with panic episodes.

Another variable to be examined is anxiety sensitivity. Anxiety sensitivity is an anxiety-related construct that has garnered considerable attention in the research on anxiety disorders. It refers to the fear of anxiety and its associated symptoms, based on the belief that these symptoms may lead to potentially harmful physical, psychological, and social consequences (Poulos et al., 2020). Anxiety sensitivity is considered a risk factor for the development of anxiety disorders, particularly panic disorder, though studies indicate that it is also linked to several other anxiety disorders (Esnaani et al., 2020).

Studies indicate that the anxiety sensitivity index consists of three subscales:

1. fear of physical sensations,
2. fear of cognitive loss of control, and
3. fear of being observed by others.

Over the past two decades, research has demonstrated that anxiety sensitivity plays a crucial role in the etiology of anxiety disorders, particularly panic disorder (Engheran et al., 2020). Furthermore, studies show that anxiety sensitivity contributes to an increase in both the intensity and frequency of panic attacks (Behnk et al., 2021). These findings further support the current research. Recent investigations also reveal that individuals with panic disorder exhibit higher levels of anxiety sensitivity compared to the general population (Rines et al., 2020).

Individuals with anxiety sensitivity may react more strongly to both their environment and various emotional states compared to others. This heightened sensitivity can serve as an additional trigger for panic attacks. In other words, people who are sensitive to anxiety may be more prone to experiencing panic attacks due to their exaggerated reactions to their surroundings (Mahmoud Alilo, 2010).

Behnk et al. (2021) stated that anxiety sensitivity can exacerbate the symptoms of panic attacks. Individuals with high anxiety sensitivity may be more sensitive to small and ordinary details compared to others, and this heightened sensitivity can lead to increased feelings of worry and fear during panic attacks.

Engheran et al. (2020) also stated that anxiety sensitivity may contribute to the continuation of the increasing cycle of panic disorder. In other words, individuals with anxiety sensitivity may experience heightened anxiety in response to panic attacks, and this anxiety can lead to the intensification and recurrence of attacks (Engheran et al., 2020).

Based on the aforementioned content, the available literature indicates that, despite numerous studies on the factors affecting patients with panic disorder and healthy individuals, no study has been found that compares early maladaptive schemas, emotional expression, and anxiety sensitivity in patients with panic disorder and healthy individuals. Therefore, there is a research

gap, and we aim to answer the following question: Is there a significant difference between early maladaptive schemas, emotional expression, and anxiety sensitivity in patients with panic disorder and healthy individuals?

RESEARCH METHOD

This study is of a causal-comparative design. The statistical population consisted of two groups: individuals with panic disorder and those without, both selected from Dr. Omid Rezaei's clinic in the Mian Fatemi area. In causal-comparative research, it is generally recommended to include at least 15 participants per group (Delavar, 2019). Therefore, in this study, efforts were made to select 30 individuals with panic disorder and 30 healthy individuals through convenience sampling. The total sample consisted of 19 women and 11 men. The required sample was drawn from the clinic where the researcher is receiving personal treatment.

In the present study, standardized questionnaires were used to collect the required data and measure the research variables, as described below.

Young Schema Questionnaire (YSQ; 1994)

The original version of the Young Schema Questionnaire (YSQ) was created by Young in 1994 to assess early maladaptive schemas. The short form of this questionnaire was developed to measure 15 early maladaptive schemas (Young, 1998) based on the original version. This questionnaire consists of 75 items, which are rated by participants on a scale from 1 = completely false, 2 = mostly false, 3 = somewhat true or false, 4 = slightly true, 5 = mostly true, and 6 = completely true. Research findings suggest that the short form of the questionnaire when administered to an Iranian sample, shows high reliability, consistent with Young's (1994) results. The test-retest reliability coefficients for all components were reported as satisfactory. The questions in this questionnaire are designed to assess 15 early maladaptive schemas, with five items assigned to each schema. If the average score for any schema is 2.5 or higher, it is considered maladaptive.

The dimensions of early maladaptive schemas are as follows:

- Emotional Deprivation (items 1 to 5)
- Abandonment/Instability (items 6 to 10)
- Mistrust/Abuse (items 11 to 15)
- Social Isolation/Alienation (items 16 to 20)
- Defectiveness/Shame (items 21 to 25)
- Failure (items 26 to 30)
- Dependence/Incompetence (items 31 to 35)
- Vulnerability to Harm or Illness (items 36 to 40)
- Enmeshment/Unclear Boundaries (items 41 to 45)
- Subjugation (items 46 to 50)
- Self-Sacrifice (items 51 to 55)
- Emotional Inhibition (items 56 to 60)
- Unrelenting Standards (items 61 to 65)
- Entitlement/Grandiosity (items 66 to 70)
- Insufficient Self-Control/Self-Discipline (items 71 to 75)

It is important to mention that Young reported the reliability of the Young Schema Questionnaire as 0.862. In the study conducted by Mosaddeghian (2023), the reliability of the

items was also evaluated, with a Cronbach's alpha coefficient of 0.896. Furthermore, the content validity of the items in Mosaddeghian's (2023) research was confirmed through expert evaluations. In the current study, the Cronbach's alpha coefficient for the variable in question was found to be 0.842.

Emotional Expressivity Questionnaire by King and Emmons (1990):

The Emotional Expressivity Questionnaire (EEQ) was created by King and Emmons in 1990. It comprises 16 items, which are divided into three subscales: 7 items evaluate the expression of positive emotions, 5 items measure the expression of intimacy, and 4 items assess the expression of negative emotions. The EEQ utilizes a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Initially, the reliability of the scale was determined through internal consistency, with Cronbach's alpha coefficients reported as 0.68 for the total scale, 0.65 for positive emotion expressivity, 0.59 for intimacy expressivity, and 0.68 for negative emotion expressivity. In a study by Rafieinia et al. (2008), Cronbach's alpha values for the total scale and its subscales—positive emotion expressivity, intimacy expressivity, and negative emotion expressivity—were reported as 0.79, 0.77, 0.73, and 0.77, respectively. In the current study, Cronbach's alpha coefficient for the overall scale was found to be 0.836.

Liebowitz Social Anxiety Scale – Panic Version (Liebowitz et al., 1984):

The Liebowitz Social Anxiety Scale – Panic Version was developed by Liebowitz and colleagues in 1984. This questionnaire contains 27 items, with participants responding using a four-point Likert scale (Never, Mild, Moderate, Severe), which are scored as 0, 1, 2, and 3, respectively. The total score that a respondent can obtain ranges from 0 to 81. The reliability and validity of this scale have been reported as satisfactory in both clinical and non-clinical studies (Bandelow et al., 2000).

Questionnaire components:

Components of the Questionnaire	References	Questions
Social Anxiety	Liebowitz et al., 1984	1-27

The reliability of the questionnaire was assessed using Cronbach's alpha coefficient. Generally, the value of Cronbach's alpha ranges from zero (0), indicating no reliability, to one (1), indicating perfect reliability. The closer the value is to one, the higher the reliability of the questionnaire. The Cronbach's alpha for the Social Anxiety Questionnaire is 0.75.

Anxiety Sensitivity Index-Revised (ASI-R) – Taylor & Cox (1998)

The original questionnaire was created by Rys and Peterson in 1985, consisting of 16 items and three subscales. It had a relatively small number of items, primarily focusing on assessing the fear of physical symptoms. In 1998, Taylor and Cox revised the Anxiety Sensitivity Index, replacing many irrelevant, unclear, and difficult-to-understand questions with more appropriate ones. They expanded the questionnaire from three to four dimensions and increased the number of items from 16 to 36. The subtests include:

Fear of cardiovascular and gastrointestinal symptoms: Items 7, 20, 21, 22, 23, 24, 26, 27, 28, 29

Fear of respiratory symptoms: Items 1, 2, 3, 4, 6, 8, 10

Fear of observable anxiety reactions in social situations: Items 9, 13, 14, 15, 16, 17, 18, 19

Fear of cognitive control loss: Items 32, 33, 34, 35, 36

Items 5, 11, 12, 25, 30, and 31 do not fit into the above four subscales, based on the validation conducted by Moradi Manesh and colleagues (2007).

The internal consistency coefficient of the questionnaire, based on Cronbach's alpha for factors 1 to 4, was reported as 0.91, 0.86, and 0.88, respectively. The correlation coefficient between the revised Anxiety Sensitivity Index and the original Anxiety Sensitivity Index was found to be 0.94. The correlations between the factors ranged from 0.28 to 0.40, and with the overall factor, they ranged from 0.66 to 0.77 (Taylor & Cox, 1998). The results of Taylor and Cox's study suggest that the revised Anxiety Sensitivity Index has high validity and reliability, making it an effective and valuable tool for assessing anxiety sensitivity. Dick and colleagues (2003) reported an internal consistency coefficient of 0.95 for the scale. This questionnaire was adapted for use in Iran by Moradi Manesh and colleagues (2007). Confirmatory factor analysis using Varimax rotation and the Scree plot indicated four factors: "Fear of cardiovascular and gastrointestinal symptoms," "Fear of respiratory symptoms," "Fear of observable anxiety reactions in social situations," and "Fear of cognitive control." These factors explained more than 58% of the total variance in the questionnaire. The reliability of the revised Anxiety Sensitivity Index was calculated using three methods: internal consistency, test-retest reliability, and split-half reliability. The coefficients for the entire scale were 0.93, 0.95, and 0.97, respectively.

The reliability coefficients of the subscales were calculated using internal consistency, test-retest, and split-half methods. The obtained coefficients were 0.82, 0.91, 0.92, 0.96, 0.76, and 0.90, respectively. The validity of the index was assessed using three methods: concurrent validity, correlations between the subscales and the total scale, and factor analysis. Concurrent validity of the revised Anxiety Sensitivity Index was established by administering it alongside the Revised 90-Item Symptom Checklist, yielding a correlation coefficient of 0.56. The correlations between the subscales and the total score were satisfactory, ranging from 0.74 to 0.88. The correlations among the subscales ranged from 0.40 to 0.68. In the current study, the Cronbach's alpha coefficient for the variable in question was found to be 0.749.

Method of Implementation:

In the present study, after developing the questionnaire, the researcher took the necessary steps to distribute and collect the data, as well as coordinate with the center specializing in panic disorder for sample selection. Among individuals diagnosed with panic disorder, those willing to participate visited the research site, followed the health protocols, and completed the questionnaires.

RESEARCH FINDINGS

Examination of the normality or non-normality of the data

Table 1. Kolmogorov-Smirnov Test of Research Indices

The index of	skewness	skewness error	kurtosis	Error of kurtosis	Test Statistic	Significance Level
Early Maladaptive Schemas	0.001	0.205	-1.818	0.407	0.212	0.075
Emotional Expressivity	0.031	0.205	-1.741	0.407	0.201	0.081
Anxiety Sensitivity	0.095	0.205	-1.499	0.704	0.157	0.134

As shown in the data from Table 1, the significance levels of the Kolmogorov-Smirnov test for early maladaptive schemas (0.075), emotional expression (0.081), and anxiety sensitivity (0.134) are greater than 0.05. Therefore, the distributions are considered normal.

Hypothesis Testing

Main Hypothesis: There is a difference between early maladaptive schemas, emotional expression, and anxiety sensitivity in patients with panic disorder and healthy individuals. To test the assumption of homogeneity of variance-covariance matrices across groups, the results of Mauchly's test for equality of variance-covariance matrices between the two groups are reported in Table 2:

Table 2. Results of Mauchly's Test for Homogeneity of Covariance Matrices

Significance Level	df2	df1	F Statistic Value	Box Statistic
0.131	24373.132	6	1.164	10.432

As seen in Table 2, based on Box's test, the result is not significant, and the assumption of homogeneity of variance/covariance matrices is properly satisfied ($p = 0.131$, $F = 1.641$, $BOX = 10.432$).

In Table 3, the examination of homogeneity of error variances across the two groups is reported.

Table 3. Results of Testing Homogeneity of Error Variances Across the Two Groups

Variable	F Statistic Value	df1	df2	Sig.
Early Maladaptive Schemas	0.223	1	58	0.634
Emotional Expression	0.162	1	58	0.689
Anxiety Sensitivity	1.437	1	58	0.122

The findings from Table 3 show that the F statistic of Levene's test for testing the homogeneity of error variances across the research groups for early maladaptive schemas (0.223), emotional expression (0.162), and anxiety sensitivity (1.437) are not significant. These results indicate that the error variances of these variables are homogeneous across the groups.

Table 4. Results of Multivariate Analysis of Variance (MANOVA)

Test Name	Value	F Statistic Value	Degrees of Freedom for the Hypothesis	Degrees of Freedom for Error	Significance Level	Eta Squared
Pillai's Trace Test	0.752	56.646	3	56	0.001	0.752
Wilks' Lambda Test	0.248	56.646	3	56	0.001	0.752
Hotelling's Trace Test	3.035	56.646	3	56	0.001	0.752
Largest Root Test	3.035	56.646	3	56	0.001	0.752

As shown in Table 4, the findings from the multivariate analysis of covariance indicate that the multivariate F value is statistically significant at the 0.05 level ($p > 0.05$) for all tests. Therefore, it can be said that there is a significant difference between the two groups on at least one of the indices. The eta-squared (which is essentially the squared correlation coefficient between the dependent variables and group membership) indicates that the difference between the two groups, considering the dependent variables, is statistically significant, and the size of this difference is 75.2%. This means that 75.2% of the difference in the scores between the two groups is due to the presence of panic disorder.

Table 5. Results of Multivariate Analysis of Variance (MANOVA) to Compare Between the Two Groups

Component	Sum of Squares	Degrees of Freedom	Mean Squares	F Statistic Value	Significance Level	Effect Size
Early Maladaptive Schemas	13172.017	1	13172.017	106.084	0.001	0.647
Emotional Expressiveness	686.817	1	686.817	23.749	0.001	0.291
Anxiety Sensitivity	4824.067	1	4824.067	47.813	0.001	0.452

As shown in the results of Table 5, the significance level of the test for early maladaptive schemas ($p < 0.05$), emotional expression ($p < 0.05$), and anxiety sensitivity ($p < 0.05$) is significant. Therefore, the hypothesis that the scores of these components are the same between the two groups of patients with panic disorder and healthy individuals is not accepted.

First Hypothesis: There is a difference between early maladaptive schemas in patients with panic disorder and healthy individuals. To test the assumption of homogeneity of variance-covariance matrices across groups, the results of Mauchly's test for equality of variance-covariance matrices for working memory between the two groups are reported in Table 6:

Table 6. Results of Mauchly's Test for Homogeneity of Covariance Matrices

Box Statistic	F Statistic Value	df1	df2	Significance Level
136.324	0.821	120	10.429.613	0.924

As seen in Table 6, based on Box's test, the result indicates non-significance and the assumption of homogeneity of variance/covariance matrices is properly satisfied ($p = 0.924$, $F = 0.821$, $BOX = 136.324$). In Table 7, the examination of homogeneity of error variances across the two groups is reported.

Table 7. Results of Testing Homogeneity of Error Variances for Early Maladaptive Schemas Across the Two Groups

Variable	F Statistic Value	df1	df2	Sig.
Emotional Deprivation	0.361	1	58	0.550
Abandonment/Instability	0.001	1	58	0.999
Mistrust/Abuse	1.836	1	58	0.181
Social Isolation	0.064	1	58	0.801
Defect/Shame	0.160	1	58	0.690
Failure	0.736	1	58	0.394
Dependence	0.142	1	58	0.707
Vulnerability	0.089	1	58	0.767
Unmet Self	0.176	1	58	0.676
Compliance	1.572	1	58	0.215
Self-Sacrifice	3.587	1	58	0.063
Emotional Inhibition	2.039	1	58	0.104
Rigid Standards	1.473	1	58	0.230
Entitlement/Grandiosity	0.045	1	58	0.832
Self-Control	1.267	1	58	0.265

The findings from Table 7 show that the F statistic of Levene's test for testing the homogeneity of error variances of the variables is not significant. These findings indicate that the error variances of these variables are homogeneous across the groups.

Table 8. Results of Multivariate Analysis of Variance for Early Maladaptive Schemas

Test Name	Value	F Statistic Value	Degrees of Freedom for the Hypothesis	Degrees of Freedom for Error	Significance Level	Eta Squared
Pillai's Trace Test	0.806	12.174	15	44	0.001	0.806
Wilks' Lambda Test	0.194	12.174	15	44	0.001	0.806
Hotelling's Trace Test	4.150	12.174	15	44	0.001	0.806
Largest Root Test	4.150	12.174	15	44	0.001	0.806

As shown in Table 8, the findings from the multivariate analysis of covariance indicate that the multivariate F value is statistically significant for all tests at the level of $p < 0.05$. Therefore, it can be concluded that there is a significant difference between the two groups in at least one of the early maladaptive schemas. The eta squared (which is the square of the correlation coefficient between the dependent variables and group membership) indicates that the difference between the two groups, considering the dependent variables, is statistically significant, and the amount of this difference is 80.6%.

Table 9. Results of Multivariate Analysis of Variance (MANOVA) for Comparing the Two Groups

Component	Sum of Squares	Degrees of Freedom	Mean Squares	F Statistic Value	Significance Level	Effect Size
Emotional Deprivation	52.267	1	52.267	28.963	0.001	0.333
Abandonment/Instability	109.350	1	109.350	40.682	0.001	0.412
Mistrust/Abuse	91.267	1	91.267	28.237	0.00	0.327
Social Isolation	93.750	1	93.750	32.935	0.001	0.362
Defectiveness/Shame	147.267	1	147.267	19.576	0.00	0.252
Failure	147.267	1	147.267	13.046	0.001	0.184
Dependence	29.400	1	29.400	2.382	0.128	0.039
Vulnerability	58.017	1	58.017	7.385	0.009	0.113
Undeveloped Self	19.267	1	19.267	1.294	0.260	0.022
Subjugation	106.667	1	106.667	7.38	0.009	0.112
Self-Sacrifice	1.667	1	1.667	0.082	0.776	0.001
Emotional Inhibition	1.667	1	1.667	0.094	0.760	0.002
Rigidity of Standards	91.267	1	91.267	7.546	0.008	0.115
Entitlement/Grandiosity	48.60	1	48.60	5.013	0.029	0.080
Self-Discipline	45.067	1	45.067	9.831	0.003	0.145

As shown in the results of Table 9, the significance level of the test for all early maladaptive schemas, except for Dependency, Unhealthy Self-Representation, Altruism, and Emotional Inhibition, is less than 0.05 and is statistically significant. Therefore, the hypothesis of equal scores for these components between the two groups of patients with panic disorder and healthy individuals is not accepted. Based on the mean scores in Table 9, it is clear that the mean scores for the significant schemas in patients with panic disorder are higher.

Hypothesis 2: There is a difference in emotional expression between patients with panic

disorder and healthy individuals. To examine the assumption of homogeneity of variance-covariance matrices between groups, the results of the M-Bax test for equality of active memory variance between the two groups are reported in Table 10.

Table 10: Results of the M-Bax Test for Examining the Assumption of Homogeneity of Covariance Matrices

Box Statistic	F Statistic Value	df1	df2	Significance Level
8.122	1.277	6	24373.132	0.264

As seen in Table 10, the result of the Box test is not significant, and the assumption of homogeneity of variance/covariance matrices is properly satisfied ($p = 0.264$, $F = 1.277$, $BOX = 8.122$). In Table 9, the homogeneity of error variances across the two groups is reported.

Table 11. Results of Testing the Homogeneity of Error Variances of Emotional Expression in Two Groups

Variable	F Statistic Value	df1	df2	Sig.
Positive Emotional Expression	1.538	1	58	0.220
Intimacy Expression	3.618	1	58	0.062
Negative Emotional Expression	0.047	1	58	0.829

The findings in Table 11 show that the F statistic of Levene's test for testing the homogeneity of error variances for the variables is not significant. These findings indicate that the error variances of these variables are homogeneous across the groups.

Table 12. Results of Multivariate Analysis of Variance (MANOVA) for Emotional Expression

Test Name	Value	F Statistic Value	Degrees of Freedom for the Hypothesis	Degrees of Freedom for Error	Significance Level	Eta Squared
Pillai's Trace Test	0.656	35.651	3	56	0.001	0.656
Wilks' Lambda Test	0.344	35.651	3	56	0.001	0.656
Hotelling's Trace Test	1.910	35.651	3	56	0.001	0.656
Largest Root Test	1.910	35.651	3	56	0.001	0.656

As shown in Table 12, the findings from the multivariate analysis of covariance indicate that the multivariate F value is statistically significant at the 0.05 level in all tests ($p < 0.05$).

Therefore, it can be concluded that there is a significant difference between the two groups in at least one aspect of emotional expression. The eta-squared value (which is the square of the correlation coefficient between the dependent variables and group membership) shows that the difference between the two groups, considering the dependent variables, is significant, and the extent of this difference is 65.6%.

Table 13. Results of the Multivariate Analysis of Variance (MANOVA) Test for Comparing Two Groups

Component	Sum of Squares	Degrees of Freedom	Mean Squares	F Statistic Value	Significance Level	Effect Size
Positive Emotional Expression	326.667	1	326.667	35.704	0.001	0.381
Intimacy Expression	273.067	1	273.067	29.890	0.001	0.340
Negative Emotional Expression	70.417	1	70.417	9.852	0.003	0.145

As the results of Table 13 indicate, the significance level for the test of the components of positive emotional expression ($P < 0.05$), intimacy expression ($P < 0.05$), and negative emotional expression ($P < 0.05$) is significant. Therefore, the hypothesis of equal scores for these components between the two groups, panic disorder patients and healthy individuals, is not accepted. Based on the mean scores, the mean scores for positive emotional expression and intimacy expression are higher in healthy individuals, while the mean score for negative emotional expression is higher in panic disorder patients.

Hypothesis 3: There is a difference in anxiety sensitivity between panic disorder patients and healthy individuals. To examine the assumption of homogeneity of variance-covariance matrices between the groups, the results of the Box's M test for equality of variance-covariance matrices between the two groups are reported in Table 14:

Table 14. Results of the Box's M Test for Homogeneity of Covariance Matrices Assumption

Box Statistic	F Statistic Value	df1	df2	Significance Level
14.957	1.351	10	16082.869	0.197

As seen in Table 19, the Box's M test is not significant, and the assumption of homogeneity of covariance matrices is properly met ($p = 0.197$, $F = 1.351$, $BOX = 14.597$). Table 20 reports the test of homogeneity of error variances between the two groups.

Table 20. Results of the Homogeneity of Error Variances Test for Anxiety Sensitivity in the Two Groups

Variable	F Statistic Value	df1	df2	Sig.
Fear of Cardiovascular and Gastrointestinal Symptoms	0.212	1	58	0.647
Fear of Respiratory Symptoms	0.431	1	58	0.233
Fear of Observable Anxiety Reactions in Public	0.087	1	58	0.769
Fear of Cognitive Control	0.003	1	58	0.958

The findings of Table 20 indicate that the F statistic of Levin's test for homogeneity of error variances is not significant. These findings suggest that the error variances of these variables are homogeneous across the groups.

Table 21. Results of Multivariate Analysis of Variance for Anxiety Sensitivity

Test Name	Value	F Statistic Value	Degrees of Freedom for the Hypothesis	Degrees of Freedom for Error	Significance Level	Eta Squared
Pillai's Trace Test	0.469	12.168	4	55	0.001	0.469
Wilks' Lambda Test	0.531	12.168	4	55	0.001	0.469
Hotelling's Trace Test	0.885	12.168	4	55	0.001	0.469
Largest Root Test	0.885	12.168	4	55	0.001	0.469

As shown in Table 21, the findings from the multivariate analysis of covariance indicate that the multivariate F value is statistically significant at the 0.05 level ($p > 0.05$) for all tests. Therefore, it can be concluded that there is a significant difference between the two groups in at least one aspect of anxiety sensitivity. The eta-squared (which is the squared correlation coefficient between the dependent variables and group membership) indicates that the difference between the two groups, based on the dependent variables, is significant overall, with this difference accounting for 46.9%.

Table 22. Results of the Multivariate Analysis of Variance (MANOVA) Test for Comparison Between the Two Groups.

Component	Sum of Squares	Degrees of Freedom	Mean Squares	Test Statistic F	Significance Level	Effect Size
Fear of cardiovascular and gastrointestinal symptoms	821.40	1	40/821	29.115	0.001	0.334
Fear of respiratory symptoms	187.267	1	267/187	12.364	0.001	0.176
Fear of observable anxiety reactions in social settings	170.017	1	017/170	6.595	0.013	0.102
Fear of cognitive control	198.017	1	017/198	15.644	0.001	0.212

As indicated by the results in Table 22, the significance level for the test of components such as fear of cardiovascular and gastrointestinal symptoms ($p < 0.05$), fear of respiratory symptoms ($p < 0.05$), fear of observable anxiety reactions in public ($p < 0.05$), and fear of cognitive control ($p < 0.05$) is significant. Therefore, the hypothesis of equal scores for these components between the two groups of patients with panic disorder and healthy individuals is rejected. Based on the average scores in Table 4-5, it is evident that the mean scores for all four components are higher in patients with panic disorder.

DISCUSSION ON THE RESULTS

Main Hypothesis: There are differences between the early maladaptive schemas, emotional expression, and anxiety sensitivity in patients with panic disorder and healthy individuals. The results of the data analysis in this study indicate that there are differences between early maladaptive schemas, emotional expression, and anxiety sensitivity in patients with panic

disorder and healthy individuals ($p < 0.05$). This finding is consistent with the results of studies by Ozkurmak Karagozlu (2022), Tareq and colleagues (2021), Zeynal and Yuzer (2020), Fostino and Vasco (2020), Kanst and colleagues (2020), Lahast and colleagues (2016), Mahmoudzadeh and Pakizeh (2023), Hadi Zadeh and colleagues (2020), Hashemi and Mahdian (2021), Poulos and colleagues (2020), and Esnani and colleagues (2020). As noted in the literature, early maladaptive schemas are cognitive-emotional patterns of self-damage that form in the mind during early development and are repeated throughout life. The schemas and ineffective ways that patients learn to interact with others are often the underlying factors of psychological disorders like depression. Changes in schema therapy are significant because they represent a type of lifestyle change. One of the therapeutic strategies in schema therapy involves experiential techniques, which create the most change in schemas. Through these techniques, patients can link their cognitive belief that the schemas are wrong to their emotional belief (Amani et al., 2017). Emotional expression, a key component of emotions, refers to the outward display of emotion, regardless of whether it is positive or negative, or its form (such as facial, verbal, or behavioral). According to Lewis (2010), emotional expressions result in observable changes in the face, voice, body, and activity levels. Some individuals express their emotions openly without concern for the consequences, and these individuals are characterized by an emotional expression style. Others tend to suppress their emotional responses, which reflects an emotional inhibition style. Emotional expression encompasses three fundamental aspects: positive emotional expression, negative emotional expression, and intimacy expression.

Anxiety sensitivity is regarded as a significant risk factor for the development of anxiety disorders, particularly panic disorder. However, research also suggests that this construct is linked to various other anxiety disorders (Esnani & colleagues, 2020). Studies indicate that the anxiety sensitivity index includes three subscales: 1) fear of physical sensations, 2) fear of cognitive loss of control, and 3) fear of being observed by others. Over the past two decades, research has highlighted the central role of anxiety sensitivity in the etiology of anxiety disorders, especially panic disorder (Enghiran & colleagues, 2020). Thus, the findings can be explained as follows: Early maladaptive schemas are deep cognitive structures that originate from childhood and adolescent experiences and influence how individuals interpret and process information. People with anxiety disorders, including panic disorder, are more likely to develop these schemas due to their personality traits and life experiences. These schemas are often formed as a result of stressful childhood experiences, cognitive differences, heightened sensitivity to stress, and negative information processing, all of which are related to the cognitive traits and negative experiences of individuals. Additionally, biological and genetic factors, such as heredity and neurobiological activity, along with unhealthy coping mechanisms and negative thought patterns, play a crucial role in the formation of these schemas. Family dynamics, social relationships, and cultural expectations are also recognized as significant social and cultural influences. Ultimately, the complex interaction of these biological, psychological, social, and cultural factors strengthens and solidifies early maladaptive schemas in individuals with panic disorder. Experimental and clinical studies suggest that long-term exploration of these factors can lead to a deeper understanding of this process and offer more effective intervention and treatment strategies.

Emotional expression in individuals with panic disorder may be more pronounced than in healthy individuals for several reasons. First, these individuals often experience stronger and more intense emotions, which leads to greater emotional expression. Second, expressing emotions can act as a coping mechanism to alleviate psychological stress and ongoing anxiety, making these individuals more likely to vocalize their feelings as a way of releasing emotional tension. Additionally, repeated panic attacks increase their awareness of their emotional states, which can further enhance emotional expression. Moreover, emotional expression may be used as a means of seeking social support, as individuals with panic disorder, due to their intense anxiety and fear, may seek empathy and assistance from others. Past experiences also play a

crucial role; if an individual has found that expressing emotions helps reduce anxiety or garner support, they are more likely to continue this behavior. Finally, personality differences can influence emotional expression, as some individuals are naturally more expressive, and this tendency is heightened in those with panic disorder due to their anxious state. These factors collectively explain why emotional expression is more common in individuals with panic disorder compared to healthy individuals.

Anxiety sensitivity is typically higher in individuals with panic disorder compared to healthy individuals. This increased sensitivity arises from the misinterpretation of bodily symptoms, where individuals with panic disorder view physical anxiety symptoms—such as heart palpitations or dizziness—as signs of more severe issues, like a heart attack or losing control. These negative interpretations amplify anxiety and sensitivity to these symptoms. Additionally, past experiences of panic attacks make these individuals more attuned to the early signs of anxiety, as they perceive these symptoms as signals of an impending attack. Additionally, individuals with panic disorder often avoid situations or activities that might trigger anxiety symptoms due to their fear of experiencing them. This avoidance behavior reinforces and amplifies anxiety sensitivity. Furthermore, anticipatory anxiety—the constant worry about the possibility of a future panic attack—keeps the individual in a heightened state of alertness, further increasing sensitivity to anxiety symptoms. Together, these factors create a vicious cycle that contributes to the persistence and intensification of both anxiety symptoms and panic attacks.

Hypothesis 1: There is a significant difference between early maladaptive schemas in patients with panic disorder and healthy individuals. The data analysis results of this study indicate a significant difference in early maladaptive schemas between patients with panic disorder and healthy individuals, with the mean scores of all early maladaptive schemas being higher in individuals with panic disorder ($p < 0.05$). This finding is consistent with the research conducted by Baz and Özkarmak Karagoz (2022), Taregh & colleagues (2021), Zinal & Yuser (2020), Fustino & Vasco (2020), and Kanst & colleagues (2020). The explanation for this finding can be attributed to negative childhood experiences, unmet emotional needs, and the development of deep negative beliefs about oneself, others, and the world. These schemas, as entrenched cognitive and emotional patterns, shape how individuals process information and respond emotionally, often leading to significant psychological distress. One of the schemas particularly prevalent in individuals with panic disorder is the abandonment/instability schema. This schema arises from early experiences in which the individual felt that important people in their life were unstable, unpredictable, or unable to meet their emotional needs. As a result, the individual develops a persistent fear of abandonment or losing their loved ones. This deep-seated fear, especially during stressful situations, can significantly heighten anxiety and trigger panic attacks. Individuals with this schema are highly sensitive to any sign of instability in their relationships, and their constant fear of being abandoned or left alone exacerbates their anxiety, leading to recurring panic episodes. Another schema that is more prominent in individuals with panic disorder is the vulnerability to harm or illness schema. This schema causes individuals to feel constantly at risk of serious and sudden threats, such as life-threatening illnesses, unexpected accidents, or natural disasters. In the case of individuals with panic disorder, this schema specifically manifests concerning physical symptoms. For instance, the person might interpret heart palpitations or shortness of breath as signs of a heart condition or an impending heart attack, which significantly amplifies anxiety and eventually leads to a panic attack. This constant fear of impending catastrophe is perpetuated by the heightened sensitivity these individuals have toward their physical sensations.

The defect/shame schema is also highly prevalent in individuals with panic disorder. This schema is rooted in the belief that the individual is fundamentally flawed, inadequate, or unacceptable and that if others truly knew them, they would be rejected. This profound sense of shame and inadequacy leads individuals to avoid social situations where their anxiety

symptoms might become visible. For example, someone who views panic attacks as a sign of personal weakness or insufficiency may continually avoid social gatherings to prevent exposure to others and the potential for judgment or rejection. This social avoidance further exacerbates feelings of isolation and anxiety, increasing the likelihood of panic attacks.

Finally, the failure schema is another early maladaptive schema that is more prevalent in individuals with panic disorder. This schema is linked to the belief that the individual is incapable of achieving success and that they are either failures or will fail in comparison to others. These individuals often feel they lack control over their lives or circumstances, and this belief triggers intense anxiety when faced with daily challenges or external pressures. Any expectation of success or good performance in significant situations becomes a major threat, potentially triggering panic attacks. This fear of failure, coupled with the inability to manage these situations, significantly heightens anxiety, ultimately leading to panic attacks.

In general, early maladaptive schemas in individuals with panic disorder, due to deeply ingrained beliefs and the misprocessing of information through these patterns, make them more sensitive to both real and perceived threats. These schemas serve as cognitive filters, causing individuals to interpret everyday information and experiences as exaggerated threats. These faulty cognitive processes, along with the emotional reactions they trigger, directly contribute to the increased frequency and intensity of panic attacks. As a result, individuals with panic disorder are more influenced by early maladaptive schemas, which primarily fuel their anxiety and panic attacks.

Hypothesis 2: There is a significant difference between emotional expression in patients with panic disorder and healthy individuals. The data analysis from this study revealed a difference in emotional expression between patients with panic disorder and healthy individuals. Specifically, the mean scores for positive emotional expression and intimacy were higher in healthy individuals, while negative emotional expression was higher in those with panic disorder ($p < 0.05$). This finding is consistent with the results of Kanst et al. (2020), Lahast et al. (2016), Mahmoudzadeh and Pakizeh (1402), and Hadizadeh et al. (1399). This difference in emotional expression can be attributed to a combination of psychological, biological, and social factors. Healthy individuals typically have better emotional balance, which enables them to express positive emotions more easily. They are more adept at regulating their emotions and, in positive social environments, feel safe, which encourages them to share emotions such as joy and intimacy. Positive experiences in social relationships and support from their environment further reinforce this tendency to express positive emotions. Moreover, their nervous systems are less sensitive to stressors, making them better equipped to respond to positive stimuli, which facilitates the expression of positive emotions. In contrast, individuals with panic disorder, due to chronic anxiety and frequent panic attacks, are more influenced by negative emotions like fear and worry. They tend to express negative emotions more, likely due to greater nervous system sensitivity to stress and imbalances in neurotransmitters like serotonin and norepinephrine. Additionally, concerns about social judgment and the stigma associated with their disorder may lead them to avoid expressing positive emotions. Ineffective defense mechanisms, such as avoidance and emotional suppression, might also prevent them from effectively processing their emotions, resulting in a greater expression of negative emotions. Overall, these differences arise from a complex interplay of biological, psychological, and social factors, with healthy individuals more inclined to express positive emotions and intimacy, while those with panic disorder are more likely to express negative emotions.

Hypothesis 3: There is a significant difference in anxiety sensitivity between patients with panic disorder and healthy individuals. The data analysis results from this study revealed a significant difference in anxiety sensitivity between individuals with panic disorder and healthy controls. Specifically, the mean scores of anxiety sensitivity components were higher in those

with panic disorder compared to healthy individuals ($p < 0.05$). This finding is consistent with the results of Hashemi and Mahdian (1400). One explanation for this finding is that individuals with panic disorder, due to their repeated experiences of panic attacks—often accompanied by severe physical symptoms such as palpitations, shortness of breath, and feelings of suffocation—become highly attuned to their bodily sensations and more sensitive to them. These recurring experiences make components like "fear of cardiovascular and gastrointestinal symptoms" and "fear of respiratory symptoms" more pronounced, as these symptoms often occur during panic attacks. Moreover, with each attack, the anxiety is intensified by specific physical symptoms, causing individuals to gradually associate these sensations with danger and threat. As a result, they become increasingly sensitive and fearful of their bodily sensations. Additionally, the component "fear of observable anxiety reactions in public" reflects concerns about others noticing their anxiety symptoms and making judgments. Individuals with panic disorder, due to past experiences and worries about having a panic attack in social settings, are highly anxious about others observing their symptoms. This fear of judgment and social stigma increases their anxiety sensitivity, causing them to perceive even minor signs of anxiety as threatening in social situations. Furthermore, the component "fear of cognitive control" is related to the fear of losing control over their thoughts and mental processes. Those with panic disorder often fear they may not be able to control their anxious thoughts, which could exacerbate a panic attack. This fear of losing control contributes to heightened anxiety sensitivity, as individuals feel incapable of managing and controlling their anxiety symptoms, thereby intensifying their anxiety. On the other hand, some studies suggest that individuals with panic disorder may be biologically and genetically predisposed to higher anxiety sensitivity. These individuals may have increased neural excitability, making them more sensitive to bodily changes and symptoms. This biological sensitivity, coupled with the heightened awareness of bodily sensations, can lead to the amplification of various components of anxiety sensitivity. Even minor physical changes may result in heightened anxiety for these individuals. In conclusion, these factors collectively contribute to the greater prominence of anxiety sensitivity components in individuals with panic disorder compared to healthy controls.

This study also had limitations. Since the study was conducted in a specific and limited sample population, caution should be exercised in generalizing the results.

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