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Brief Report

Correlation between Early Maladaptive Schemas with Automatic Negative Thoughts and Health Anxiety among School Students

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Abstract

Although health anxiety is a rare type of anxiety in adolescents and children, it has a negative impact on their mental health. Health anxiety refers to worries and fears about one's health and physical sensations. The current study aimed to examine the correlation of early maladaptive schemas with automatic negative thoughts and health anxiety in school students.This correlational research was conducted in 2022 in Tabriz, Iran. The participants were 200 students recruited through convenience sampling method. To collect data, we used the Health Anxiety Inventory, Automatic Thoughts Questionnaire, and the Young Schema Questionnaire-Short. The early maladaptive schema's factors were significantly correlated with health anxiety and automatic negative thoughts (P=0.001). Early maladaptive schemas are pervasive dysfunctional themes or patterns that negatively impress people's thoughts and lead to misinterpretations about internal and external events.

Keywords: Early maladaptive schemas, Health anxiety, Automatic negative thoughts, Student

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1. Introduction

Health anxiety (HA) is an obsessive and irrational worry about having a serious medical condition. It's also called illness anxiety, and was formerly called hypochondria. This condition is marked by a person's imagination of physical symptoms of illness (1). Also, health anxiety is an overlooked area in pediatric research. Little is known about the occurrence of HA symptoms in a child and adolescent psychiatric setting, and there are no age-appropriate diagnostic criteria and only limited number of assessment tools. Additionally, not much is known about its developmental risk factors; including negative childhood experiences related to health issues, which are of paramount importance because they can negatively affect people's thoughts (2).

Health anxiety is associated with the worries and fears related to the health and physical sensations (3). Cognitive-behavioral regulation of health anxiety, suggested by Salkovskis and Warwick (3), shows that a wide range of factors, including physical transformations, medical information, medical consultations, medical tests and reactions, and people's advice, are interpreted as signs of a dangerous disease. These misinterpretations lead to formation of more negative thoughts that are mostly aggravated by mental and emotional images. As a result, individual experiences could make health anxiety severe and steady (4).

People who experience severe health anxiety could be identified through the illness anxiety disorder criteria (hypochondriasis) (5). Its most basic symptom is the constant tendency to catastrophically misinterpret harmless physical symptoms. Based on the cognitive models, the interpretation of a situation takes the form of an automatic thought and affects emotions, behaviors, and psychological reactions (5). Negative automatic thoughts are defined as a mental quality that affects a person's ability to deal with life experiences and distort inner harmony (6).

Moreover, when it comes to developmental factors and their effects on the formation of attitudes and emotions, the concept of early maladaptive schemas come to mind. Study of Tarid and colleagues (6) showed that the early situations affect on later life conditions. Implemented studies about Early Maladaptive Schemas (EMS) and symptoms of psychological injuries have always confirmed the importance of these schemas. Illness anxiety disorder is known as a type of psychological injury, but there is scarce research on the relationship between EMS and health anxiety; for instance,

Shorey and colleagues (7) showed that physical complaints could be attributed to disconnection and rejection, impaired limits, hypervigilance, and inhibition areas. Moreover, Tarid and colleagues (6) reported that disconnection/rejection, impaired autonomy/performance, and other-directed schema domains are salient precursors of anxiety symptoms among adolescents and young adults. EMS distort the inference of daily experiences and lead to creation of misinterpretations and automatic negative thoughts (8).

A review of research literature has indicated the correlation of EMS in a wide range of mental disorders, including mood disorders and anxiety disorders. In this regard, present study aimed to investigate the relationship between EMS with negative automatic thoughts and health anxiety among student.

2. Methods

The present correlational study was conducted in 2022 in Tabriz, Iran. 200 students in the age range of 16 to 17 were recruited after public announcement of the conducting the research in girls' high-schools. For this purpose, convenience sampling was used. The age range of 16 to 17 and being a school student were the inclusion criteria. However, the only exclusion criterion was suffering from any severe mental problem (for example, schizophrenia). Based on the main objective of this study and as in correlational studies, the minimum sample size is 100; nonetheless, we considered the attrition rate and recruited 200 as the sample size. In addition, formula of Tabachnick and colleagues (9) was used for determining the sample size. They recommended to use the formula N≥50+8m in order to obtain the sample size needed for a multiple regression analysis. According to Tabachnick and colleagues (9), it is preferred to have 30 participants for each predictor variable. In the current study, there are five predictor variables, making a total of 150 participants (5×30=150). We took 200 samples into account considering the attrition rate. The study's objectives were explained to the participants who completed an informed consent form. The Ethics Committee of Tabriz University approved this study under the code of IR.TABRIZU.REC.1400.057.

2.1. Measures

The Health Anxiety Inventory (HAI): HAI is an 18-item self-report scale designed by Salkovskis and co-workers (10), each question consisting of a group of four (0-3) statements. The participant is asked to read each group of statements carefully, and then select the one which best describes his/her feelings over the last 6 months. Salkovskis and co-workers (10) reported the reliability rate of this scale by alpha coefficient which was 0.92. They also obtained 0.90 via test-retest reliability method. Besides, for assessment of validity, they used internal validity and obtained r=0.479 and P=0.0001. Salkovskis and co-workers (10) also reported the Content Validity index (CVI) and Content Validity ratio (CVR) which were 0.81 and 0.83, respectively (10).

Automatic Thoughts Questionnaire (ATQ): ATQ is a 30-item scale measuring the frequency of occurrence of automatic negative thoughts, which was developed by Hollon and Kendall (11). To measure its validity, they utilized the correlation of State-Trait Anxiety Inventory (STAI) and Beck depression inventory with ATQ. The correlation between STAI and ATQ was high (r=0.79, P=0.001). The correlation between ATQ and BDI yielded r=0.78 and P=0.001. Moreover, for reliability measurement, they used split-half reliability coefficient which is calculated on odd versus even items, being 0.97 (P=0.001). Calculation of coefficient alpha yielded a correlation of 0.96, P=0.001. Additionally, Hollon and Kendall (11) obtained 0.80 for CVI and 0.79 for CVR.

The Young Schema Questionnaire-Short Form (YSQ-SF): It is a 75-item self-report questionnaire (12) that measures 15 Early Maladaptive Schemas (EMS). EMS are grouped in five broad domains, namely disconnection and rejection, impaired autonomy, impaired limits, other-directedness, and over-vigilance and inhibition. Cronbach's alpha was calculated to determine the internal consistency of each of the 15 scales of YSQ-SF as 0.964. Moreover, to measure its validity, the 15 YSQ-S scales were used to differentiate the groups. The analysis yielded a significant discriminant function, F (2.91), P=0.0001, consisting of significant positive effects of Defectiveness and Insufficient self-control (13). Young and Brown (12) reported the CVI and CVR to be 0.86 and 0.88, respectively.

2.2. Statistical Analysis

We used Pearson correlation for calculating

the correlations among the variables. The stepwise multiple regression analysis was also utilized for prediction of dependent variables.

3. Results

As sample study, 200 students in the age range of 16 to 17 were recruited after we made a public statement about the research in girls' high-schools. The age range of 16 to 17 and being a school student were the inclusion criteria. However, the only exclusion criterion was suffering from any severe mental problem (for example, schizophrenia). At the beginning, we examined the baseline demographic variables. The results showed that 70 % (n=160) of the respondents were 17 years old while 30% (n=60) were 16. Moreover, all the participants were female (n=200, 100%). The mean and standard deviation of the main variables were health anxiety with 46.13 (4.39), automatic negative thoughts with 36.06 (4.11), and EMS with 51.33 (4.67).

To examine the correlation between maladaptive schemas and health anxiety, we used the correlation matrix (Tables 1 and 2). The results revealed a significant correlation between health anxiety and EMS components. Based on Table 1, the relationship of impaired autonomy/ performance and health anxiety was in significant level (r=0.46 and P<0.001). Also, impaired limits with health anxiety had a significant correlation (r=0.46 and P<0.001). In addition, other domains, such as disconnection/rejection (r=0.40), other-directedness (r=0.29), and over-vigilance/ inhibition (r=0.28) were significantly correlated with health anxiety (P<0.001).

Moreover, according to Table 2, the correlation between EMS components and automatic negative thoughts was significant. Disconnection/rejection (r=0.53) and impaired autonomy (r=0.47) domains had a significant relationship with automatic negative thoughts (P<0.001). Impaired limits (r=0.36), other-directedness (r=0.26), and over-vigilance/inhibition (r=0.37) were also significantly associated with automatic negative thoughts (P<0.001). Furthermore, to predict health anxiety and automatic negative thoughts based on EMS, we used the enter and liner method of regression. Adjusted R square was obtained as 0.165 for EMS. The results of liner regression are represented in Table 3.

4. Discussion

The findings of the study revealed significant correlation of EMS with automatic negative thoughts and health anxiety. The results are in line with previous studies (7-9). These studies showed significant correlation between impaired

Table 1: Correlation matrix between early maladaptive schemas with health anxiety

Variable	Component	1	2	3	4	5	6
Health anxiety		1					
	Disconnection/Rejection	0.40**	1				
Early	Impaired Autonomy	0.46**	0.12	1			
Maladaptive	Impaired Limits	0.45**	0.14	0.16	1		
Schemas	Other-Directedness	0.29**	0.11	0.10	0.15	1	
	Over-vigilance/Inhibition	0.28**	0.13	0.11	0.12	0.17	1
	Mean (SD)	41.23 (3.29)	21.16 (2.25)	19.53 (1.29)	41.23 (1.11)	41.23 (1.09)	41.23 (1.12)

**P<0.01

Table 2: Correlation matrix between early maladaptive schemas with automatic negative thoughts

Variable	Component	1	2	3	4	5	6
Automatic negative thoughts		1					
	Disconnection/ Rejection	0.53**	1				
Early	Impaired Autonomy	0.47**	0.19	1			
Maladaptive	Impaired Limits	0.36**	0.21	0.22	1		
Schemas	Other-Directedness	0.28**	0.18	0.16	0.20	1	
	Over-vigilance/ Inhibition	0.37**	0.15	0.24	0.16	0.19	1
	Mean (SD)	53.29 (4.28)	23.83 (2.21)	21.03 (1.69)	20.27 (1.49)	13.23 (1.19)	14.53 (1.07)

**P<0.01

Table 3: Standardized and non-standardized coefficients from multiple linear regression analysis to predict health anxiety and automatic negative thought

Variables	B (non-standard)	Error	Beta (Standard)	P
Disconnection/Rejection	0.608	0.266	0.124	0.001
Impaired Autonomy	0.645	0.262	0.133	0.001
Impaired Limits	0.639	0.275	0.118	0.001
Other-Directedness	0.630	259	0.144	0.001
Over-vigilance/Inhibition	0.589	0.274	0.121	0.001

Dependent variables: health anxiety and automatic negative thought

autonomy and impaired limits domains, and psychopathological symptoms. People whose schemas are in the impaired autonomy/ performance domain are not able to perform independently from their family. These schemas become apparent in families that are overprotective toward their children and are connected to children's self-confidence deficiency (5-7). People with low self-confidence are unable to cope with problems (such as illness and physical challenge) because they underestimate their ability in coping with them. These factors, especially in the face of ambiguous and threatening stimuli, create an anxiety cycle in which worries flow about the illness and physical symptoms (8-10). Consequently, beliefs of people are consolidated about being sick (13-15). In this regard, Tariq and colleagues (6) showed that a vast range of factors, such as physical transformations, medical information, medical consultations, medical tests and reactions, and people's advice, are interpreted as signs of a dangerous disease. These misinterpretations are connected to negative thoughts (8). These types of thoughts are mostly aggravated by mental and emotional images. As a result, individual experiences could make health anxiety severe and steady. On the other hand, the results of previous research (16), which examined the role of EMS in hypochondriasis, were inconsistent with the present study. Using different research tools for evaluation of illness anxiety could be a reason behind this incompatibility.

Moreover, EMS in impaired limits domain is associated with a number of problems in determining internal boundaries which are responsible for the performance and inability (11). People with this schema face some issues in responsibility and reaching the realistic goals. Therefore, in order to evade life responsibilities and unsolvable problems, they show symptoms of illness anxiety to accept the role of a patient (13-15).

In general, the findings of the current study can be theoretically conducive to better understanding of the effective factors in health anxiety. From the practical point of view, our results can highlight the importance of health anxiety among adolescents as well as the necessity of preventive measures.

4.1. Limitations

Considering that our sample were high school students, generalizing our results to other groups should be done consciously.

5. Conclusions

Early maladaptive schemas are pervasive dysfunctional themes or patterns that negatively impress people's thoughts and are associated with misinterpretations about internal and external events, such as health anxiety. In fact, due to the Early Maladaptive Schemas (EMS), factors related to the health (medical tests) are interpreted as a dangerous illness.

Ethical Approval

The Ethics Committee of Tabriz University approved this study with the code IR.TABRIZU.REC.1400.057. Also, written informed consent was obtained from the participants.

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Conflict of Interests: None declared.

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