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Modeling the relationship between attachment styles and somatic symptoms with the mediating role of emotional processing

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Abstract:

INTRODUCTION: In spite of our general knowledge about psychological roots and defects of developmental processes in the formation of somatic symptoms, the effect of the interaction of developmental components with cognitive-emotional variables is unclear. Previous researches suggest that individuals with insecure attachment may have a higher risk to experience of somatic symptoms. The main aim of this study is "Modeling the Relationship between Attachment Styles and Somatic Symptoms with the Mediating Role of Emotional Processing."

MATERIALS AND METHODS: This study was a descriptive-correlational study. Two hundred and twenty individuals aged 18–59 years living in Tehran were selected by available sampling from the general population. Collins and Reed's Adult Attachment Scale, Baker's Emotional Processing Scale, and Patient Health Questionnaire were used to collecting data. Data analysis was performed by Pearson correlation and independent *t*-test. The conceptual model presented in this study was tested with a path analysis approach.

RESULTS: Given the Chi-squared size (χ^2 = 1.214; P > 0.05), it can be said that the proposed conceptual model fits well with the observed model. Besides, checking the other absolute and relative indices also shows a very good fit of the model.

CONCLUSION: Our results showed that when the reciprocal effects of attachment styles were controlled, secure attachment could be considered as a protective factor against deficits in emotional processing and somatization of negative emotions. On the other hand, we found that when the dominant attachment style in individuals was anxiety based, it could be possible that they experience deficiency in the processing of emotion and more severe somatic symptoms.

Keywords:

Attachment, emotional processing, somatic symptoms

Introduction

Somatic symptom disorder is defined by physical disturbances impairing one's daily functioning.[1] These disturbances generally occur along with malicious thoughts, emotions, behaviors, or health-related concerns, and consequently, psychological factors play a critical role in the formation, development, and treatment of these disorders.[2] Patients with somatic symptoms tend to detach from their emotions by not engaging with conscious components of emotions (cognitive-behavioral) when facing with negative inputs such as stress.[3-5] In this regard, deficits in symbolic representation of emotion, such as limitations in emotional awareness and inability to explain and respond to emotions, are typical characteristics of individuals

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with somatic symptoms.[3,6,7] In other words, it seems that the emotion processing in people with somatic symptoms is impaired. According to Baker's theory, emotional processing can be seen as a three-step process: (1) identifying the emotional significance of a stimulus, (2) creating an emotional state, and (3) emotion or affection regulation. Failure in any of the above steps can lead to disruption of the emotional processing.[8]

On the other hand, emotional processing has an important place in attachment theory. All sorts of attachment are formed by the pattern of parent–child interaction. In the process of interacting with caregivers, the infant internalizes specific cognitive and emotional responses named internal working model. Bowlby used the term internal working model to designate a cognitive framework comprising mental representations for understanding the world, self and others. This model which will be the basis of all future interactions with others and formation of his or her attachment type, and has a particular role in processing emotional situations and acquiring emotional responses.[9,10] In other words, the process of normal emotional processing in the face of stressful situations requires the search for safe sources as real or internalized patterns of attachment.[11] Various studies have not only demonstrated the existence of a difficult transition period such as high levels of emotional abuse and neglect[12] in patients with somatic symptoms but also identified the presence of insecure attachment in these patients as a general symptom.[13] West *et al*.[14] have pointed out three major mechanisms in this regard; first, attachment insecurity can increase nonspecific vulnerability to stress that predicts the likelihood of experiencing somatic symptoms; second, it reduces access to support by creating a negative impact on one's ability to form and effectively use social support networks, and ultimately, it influences the way of assessing emotional situations and providing emotional response (emotional processing) in individuals in the face of life circumstances.[15]

Reviewing the past studies illustrates the theoretical confirmation of this model in explaining the relationship between attachment style and health-related problems.[16-18]

In fact, although emotion regulation and attachment dimensions have distinct structures, attachment patterns can be characterized by specific regulatory strategies. Thus, insecure attachment may play a role in emotion regulation problems, and these problems may have negative outcomes for physical and psychological health.[19,20] In other words, emotion regulation problems or other sorts of dysfunctional emotion regulation can potentially play a mediating role in the relationship between attachment types and health-related problems.[21]

A research by Kotler *et al*.[22] supports the hypothesis that insecure attachment is highly correlated with dysfunctional emotion processing and affects regulation strategies such as repression, self-blame, and wishful thinking.[15] These variables are associated with negative health outcomes. In addition, Marganska *et al*.[23] found that emotion dysregulation is an important mediator in the relationship between attachment styles and symptoms of depression and generalized anxiety in students. Besides, the decline in emotional awareness co-occurs with problems related to the differentiation of physical emotions and the separation of emotional arousal and somatic symptoms.[3,24,25] Recent studies have shown that patients with medically unexplained physical symptoms are unable to relate their emotions to physical complaints and misinterpret the physical aspects of emotional arousal as somatic symptoms.[3,24]

Moreover, inability to understand and express emotions is associated with immune system changes and negative impacts on health and has been considered as a risk factor for psychosomatic disorders and stress-related illnesses.[26,27] Difficulties in identifying and expressing emotions are associated with many physical health problems such as inflammatory bowel disease, chronic back pain, physical pain disorder, and tension headaches. There are also numerous studies emphasizing the impairment of emotional systems in somatic symptom disorder. These studies have shown cases of catastrophic and rumination,[28] emotional repression,[29,30] inability to positively regulate emotion,[31] imbalance in emotional arousal,[32] impaired ability in emotional awareness,[3,33] and impaired emotional regulation[4] in individuals with somatic symptoms. However, the important point is, in terms of health, what are the differences and similarities between the two types of insecure attachment.[15] For example, Kotler *et al*.[22] reported that people with avoidant attachment style use more types of ineffective emotional control (repression), which is related to emotion-focused coping strategies. These variables are, in fact, associated with negative psychological and physical symptoms.[15]

In addition, other studies have indicated that avoidant attachment is associated with malfunctioning of the immune system. In a different way, Feeney and Ryne have shown that anxious attachment is more related to health concerns and somatic symptoms.[15] Nielsen *et al*.[34] considered attachment patterns as a predictor of anxiety symptoms. They contended that when both avoidant and anxious attachments were controlled, only anxious attachment predicted symptom severity. In addition, Stanton and Campbell[35] revealed that anxious and avoidant attachments were associated with negative health outcomes, but anxious attachment compared to avoidant attachment had a stronger and more significant

relationship with somatic symptoms. In the study by Rapza *et al*., anxious and avoidant attachments were associated with lower levels of social support, but only anxious attachment was related with more somatic and psychological symptoms.[15]

It should be noted that the most important issue that explains the necessity of this research is the paradoxical situation that this problem creates for individuals who suffered from somatic symptoms. These patients have a great complaint about somatic problems which are referred to various specialists in the field of physical health that it costs a great deal for the public health system. As the main purpose of the study, conceptualizing somatic symptom-related problems through developmental variables, such as attachment styles, and dynamic processes associated with emotional processing, will have two implications for enhancing public health: (1) promoting educational perspectives, based on secure attachment style formation, at the primary prevention level of somatic problems, and (2) adopt effective psychological interventions to coping with this type of issues. Furthermore, despite some research on the moderating role of emotion regulation in the relationship between attachment styles and the severity of somatic symptoms, few studies have been conducted on the moderating role of emotional processing as a more fundamental variable. As mentioned earlier, according to Baker's emotional processing theory,[36] emotion regulation is one of the three stages of procedure of emotional processing.

A review of studies suggests that although attachment patterns are linked with physical and psychological health problems, there is no clear agreement on the degree of impact and importance of each type of insecure attachment styles (anxious and avoidant) and on how attachment safety affects the relationship between these variables. Accordingly, and as a general conclusion, this study seeks to answer the raised issues at two levels: (1) determining the extent and type of attachment style with somatic symptoms experienced by individuals and (2) examining the moderating role of emotional processing in the relationship between attachment styles and severity of somatic symptoms experienced by individuals [Figure 1].

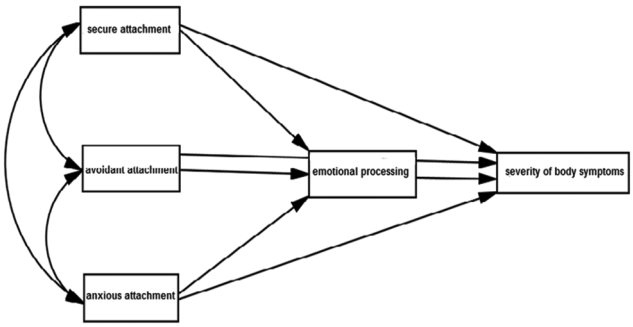

Figure 1: Conceptual model for severity of somatic symptoms

Materials and Methods

This study was a descriptive-correlational study. Two hundred and twenty-nine individuals aged 18–59 years living in Tehran who had a full understanding of writing content and writing ability were selected from the general population. For this purpose, 6 districts from 22 districts of Tehran were selected randomly (districts 2, 6, 9, 14, 17, and 21). Then, 2 cultural centers of each district were considered for conducting the research project. Finally, in the last step, 229 participants were selected from peoples that came to the center by available sampling.

It should be noted that the investigators considered the exclusion criteria related to comorbidities that could bias the results (addiction to alcohol, drug addiction, brain injury, a history of severe psychological disorder such as psychosis or bipolar disorder, current treatment with antipsychotic or opioid drugs). based on self-report, Among the participants, anyone who met at least one of the above criteria was excluded from the study.

After obtaining the required permissions to study from the University of Social Welfare and Rehabilitation Sciences and with the permission of the relevant authorities (municipality), the assistant researcher at the predetermined cultural centers of each region explained the study method to all eligible participants who came to the center in a certain period of time (2 weeks), assured them about confidentiality and anonymity of the study results, and invited them to participate in the study. To carry out the research, in the first step, a brief interview was conducted with each participant to determine inclusion and exclusion criteria. Then, in the second step, from all the interviewees, all those who met the inclusion criteria and did not include the exclusion criteria entered the main measurement phase. For data collection, after gathering demographic information, participants were asked to complete all research questionnaires described in detail in the tools section.

In this section, the measurements used in this study are presented and information on its structural and psychometric properties is given.

Attachment styles

The Collins and Reed's Adult Attachment Scale was employed to measure attachment styles. The questionnaire consists of 18 items in which the individual, through self-report, provides a graded assessment of his or her skills in forming relationships.[37] The items on this scale are rated on a 5-point Likert scale ranging

from 1 (not at all to my character) to 5 (completely to my character). Regarding the reliability of the Adult Attachment Scale, Collins and Reed) 1996. calculated the Cronbach's alpha for each subscale of secure, anxious, and avoidant above 0.80 indicating good reliability of this scale. On the other hand, in Pakdaman study, the validity of the measurement by applying the test–retest reliability method on 100 people with a time interval of 1 month indicated that the test–retest value was as high as 0.95.

Emotional processing

The Emotional Processing Scale was used to assess emotional processing in this study. This scale is a 38-item self-report measurement used to measure emotional processing styles. Each item is rated on a 5-point Likert scale (from strongly agree to strongly disagree). The scale has eight components of intrusion, repression, lack of attunement, uncontrolled, dissociation, avoidance, discordant, and externalized. Cronbach's alpha and test–retest coefficients for this scale were reported to be 0.92 and 0.79, respectively. In a preliminary study of 40 students, Lotfi calculated the correlation coefficient of this scale with the Emotion Regulation Scale to determine the validity ($r = 0.54$, $P < 0.01$). Cronbach's alpha coefficient was reported as 0.95 in another study.[34]

Severity of somatic symptoms

To assess the severity of somatic symptoms, the Patient Health Questionnaire (PHQ) was used, which is a 15-item questionnaire to measure the severity of somatic symptoms. Participants are asked to rate the severity of each of the symptoms in the past 4 weeks. By giving a rating between 0 and 2 to each item, the respondent indicates the severity of each somatic symptom. A score higher than or equal to 5 indicates mild somatic symptoms, a score equal to or greater than 10 indicates moderate symptoms, and a score equal to or higher than 15 indicates severe symptoms.[38,39] Good psychometric properties of the PHQ-15 have been shown in various studies. In addition, a Cronbach's alpha of 0.79 has been reported for the questionnaire.[40] PHQ-15 has shown good internal consistency. Its positive correlations with the 12-item General Health Questionnaire and the Beck Depression Inventory have indicated its validity. The validity of its Korean version for assessing somatic symptom severity in the psychiatric outpatient settings has also been demonstrated.[41] Research results in Iran show that the validity of the questionnaire using Cronbach's alpha is 0.92, as well as its sensitivity and specificity are 73.80% and 76.20%, respectively.[42]

The conceptual model presented in this study [Figure 1] was tested with path analysis approach, using A. (IBM company, Armonk, New York 10504-1722, US).This approach allows us to evaluate whether the hypothesized relationships between exogenous variables (secure attachment, ambivalent attachment, and avoidant attachment), mediator variable (emotional processing), and endogenous variable (somatic symptom severity) show appropriate fit or not and whether the hypothesized relationships can be proposed as a conceptual model? To estimate to what extent the covariance/correlation matrix of the assumed model fits the actual or observed data covariance/correlation matrix, we used the Chi-square test fit indices, Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Normed Fit Index (NFI), and Confirmatory Fit Index (CFI). As it is known, RMSEA < 0.10, GFI > 0.09, CFI > 0.95, and NFI > 0.95 and 0.10> indicates proper fit of the assumed model to the actual values.

The authors of this study, by attempting to adhere to ethical codes, have attempted to avoid the process and results of this study being harmful to the individual or group of persons associated with the research. The authors believe that the results emerged from this study could lead to a better understanding and awareness of somatic symptoms and thus are scientific beneficial. The findings of this study can eventuate in appropriate applied results for both diagnosis and employing effective therapeutic approaches in treating somatic symptoms. Finally, the participants in this study have signed an informed consent form to participate in it. This research was done with the ethics code (IR.USWR.REC.1396.248) received from the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences.

Results

Characteristics of the population studied

The total number of initial participants in this study was 250, which was lowered to 229 due to the elimination of incomplete questionnaires, random responses, or identical patterns of response. One hundred and forty (61.13%) were female and 89 (38.87%) of them were male. The mean age of all participants was 26.58 ± 9.56 years. The majority of the participants, i.e., 165 (72.05%), were married and only 64 (27.95%) were single. Ninety-four (41.04%) had a high school diploma or lower, 99 (43.23%) had a bachelor degree, and 36 (15.72%) had a master or doctorate degree. Of all the participants, only 28 (12.22%) had a history of medical diagnosis (such as surgery, low back pain, stomachache, and eye surgery). As an additional finding, the results of the independent group *t*-test showed that the somatic symptom severity experienced by women (mean: 9.09 ± 4.84) was significantly higher than the male's symptom severity (mean: 7.29 ± 4.97; $t = 2.714$, $P < 0.01$), and it seems that the gender affects the severity of the somatic symptoms experienced, that is, women experience more somatic symptoms than men, and that the severity of the experience is greater in women

than men. However, there was no significant difference between males and females in attachment (secure, anxious, and avoidant) and emotion processing. Furthermore, levels of attachment, emotional processing, and severity of somatic symptoms were not significantly different based on other demographic variables such as education level and marital status.

Table 1 contains the correlation coefficients between the variables present in the proposed model. The results indicated that among the three types of attachment styles (secure, avoidant, and anxious), anxious attachment had a positive and significant relationship with deficit in emotional processing and severity of somatic symptoms. On the other side, secure and avoidant attachment styles demonstrated a negative and significant relationship with deficits in emotional processing and severity of somatic symptoms.

Next, in order to determine the mediating role of emotional processing in the relationship between attachment styles (secure, avoidant, and anxious) and the severity of somatic symptoms, the conceptual model discussed in the introduction section was tested using path analysis through EMOS. It should be noted that due to the weak correlation between avoidant attachment and somatic symptom severity, this path was removed from the analyses. Accordingly, Figure 2 contains the results of the path analysis of the proposed model and the associated path coefficients. The relative and absolute indices associated with the proposed model were as follows: GFI = 0.998, CFI = 0.999, NFI = 995, and RMSEA = 0.031 (χ^2 = 1.214, P > 0.05). Given the Chi-squared size (χ^2 = 1.214; P > 0.05), it can be said that the proposed conceptual model fits well with the observed model. Besides, checking the other absolute and relative indices also shows a very good fit of the model.

Table 1: Correlations between all variables included in the analysis (*n*=229)

Variables	1	2	3	4	5
1. Secure attachment	-				
2. Avoidant attachment	0.324**	-			
3. Anxious attachment	−0.339**	−0.245**	-		
4. Emotional processing	−0.392**	−0.234**	0.420**	-	
5. Severity of body symptom	−0.187**	−0.167*	0.629**	0.417**	-

*P<0.5, **P<0.1

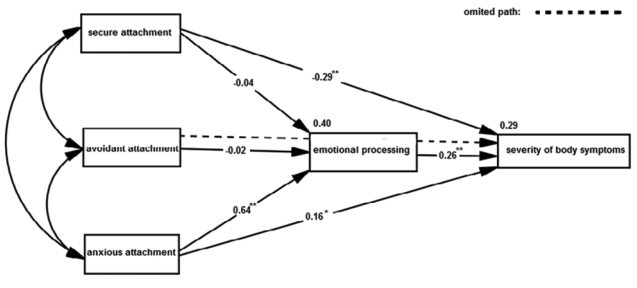

Figure 2: Cross-section path analysis model

Taking into account the mediating role of the emotional processing, the standard direct effect of each of the anxious, avoidant, and secure attachments on the emotional processing variable was 0.635, −0.023, and 0.036, respectively. Standard coefficients of direct effect of anxious attachment, avoidant attachment, and secure attachment on the severity of somatic symptoms were 0.156, 0.000, and − 0.289, respectively. In addition, the coefficients of indirect effect of anxious, avoidant, and secure attachments on the severity of somatic symptoms were −0.168, 0.006, and 0.011, in turn. Finally, the standardized overall effect coefficients of the independent and mediating variables on the severity of somatic symptoms in the observed model were as follows: anxious attachment (0.324) avoidant attachment (−0.006), secure attachment (−0.280), and emotional processing (0.265).

Discussion

The data of this study, in line with the conceptual model, showed that the weakness in emotional processing had a significant effect on the severity of somatic symptoms. In agreement with the findings of this study, numerous studies emphasize the deficit of emotional systems in somatic symptom disorder.[3,4,28-31,33] In addition, the results showed that the significant relationship between attachment styles and emotional processing had direct and indirect effects on the severity of somatic symptoms experienced by individuals, which is consistent with previous studies asserting the mediating role of deficits in emotional regulation and processing in the relationship between attachment styles and psychological trauma.[18-20,34] According to our findings, at the level of behavioral correlation, all three types of attachment styles had a significant relationship with emotional processing and severity of somatic symptoms. However, when the reciprocal effects of attachment styles were controlled, secure attachment could be considered as a protective factor against deficits in emotional processing and somatization of negative emotions due to its ability to predict negatively in relation to the severity of somatic symptoms. Various studies have shown the protective role of secure attachment in psychopathology.[43,44] On the other hand, we found that when the dominant attachment style in individuals was anxiety based, it could be possible that they experience deficiency in the processing of emotion and more severe somatic symptoms. In fact, participants who reported higher levels of anxious attachment were more likely to have difficulty in processing emotional information and consequently to experience more severe somatic symptoms. Thus, as Subic-Wrana *et al*. have proposed

based on a combination of neurobiological findings and cognitive evolution theory, it can be concluded that attachment is one of the essential components of structural development in the neurobiological system involved in emotional processing, stress balance, and self-regulation and is effective in shaping the body's implicit awareness. In other words, it seems that deep and common emotional communication can lead to an organized relationship between the psychological and biological domains of the person. Hence, attachment theory can essentially be regarded as a regulatory theory. In support of this, there is evidence showing that individuals with high levels of anxious attachment tend to catastrophize the symptoms such as pain and use overemphasizing the negative body-related emotions as a pattern for forming and keeping relationships. Moreover, high sensitivity and vigilance can make these individuals more prone to overestimate somatic symptoms.[45] In fact, these individuals tend to detach from their emotions by not engaging with the cognitive-behavioral components of emotion while facing with negative inputs such as stress.[3-5] In this regard, defects in symbolic representation of emotions such as limitations in emotional awareness and inability to explain and respond to emotions (alexithymia) are prominent features in somatic symptoms.[3,6] Losing the capacity of consciously experiencing and not differentiating emotions and expressing them in a healthy way leads to a distinct pattern of emotion regulation in these individuals characterized by heterogeneity of emotional components in emotion processing and difficulty in mental representation of emotional states.[46] Individuals with a higher degree of somatization have deficiencies in associating the physical experience of emotion with conscious emotions.[3,47] Failure in the psychological representation of emotions can lead to an expressing of physical emotion without conscious experience of them at the psychological level. These people usually do not experience emotional arousal at the cognitive level but at the physical level.

The present study had some limitations that suggest directions for future research. The most important limitation of this study is its cross-sectional character. This type of research certainly cannot be an ideal way to establish causality between different variables. Although path models include directional effects, path analysis cannot determine causal relationships between variables by itself. Furthermore, the data in this study are based on self-report measures. This might have led to faking good, especially in emotional processing. For future studies, it would be beneficial to use emotional induce methods and measure emotional processing directly in the real emotional status. Moreover, our analysis is based on a study with sample size of around 200 participants (n = 229). There is still little consensus on the recommended sample size for structural equation modeling, and the discussion on this topic is still ongoing.[15] One direction for future research is to replicate the findings presented here using larger sample sizes.

Conclusion

To summarize, our results support the notion that (1) different dimensions of insecure attachment can have differential consequences for physical health and (2) emotional processing can be one of the mechanisms that explain the links between attachment and health. The results of the study lead to reflections on the therapeutic process, psychological change, and improved well-being. Directly observing the physical effects of emotional experiencing in somatic symptoms provides sensory evidence that can enable patients to make mind-body connections and therapists' ability to identify, address, and utilize emotion processes.

Practical suggestion

Based on the results of this study, it can be suggested that the use of deeper therapeutic approaches based on the modification of emotional experience during psychotherapy, such as emotion-focused therapy or dynamic interpersonal therapy, can have a profound and long-lasting effect on reducing the severity of somatic symptoms experienced by people with somatic symptom disorder.

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Conflicts of interest

There are no conflicts of interest.

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