

# Prediction of somatoform disorder of female students through emotion regulation and thought-action fusion

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## Abstract

**Introduction:** Emotion regulation and Thought-Action Fusion (TAF) are among the most important components which cause psychological disorders. The present study aimed to predict somatoform disorder regarding the emotion regulation and TAF in female students of the Savadkuh County.

**Methods:** In this descriptive correlation study, 110 middle school female students in the city of Savadkuh in the academic year of 2012-2013 were selected through multistage cluster sampling method. The participants completed Achenbach's Youth Behavioral Disorder Questionnaire, Emotion Regulation Questionnaire, and Thought-action fusion Questionnaire for youth. The data were analyzed using SPSS-21 and Pearson's correlation coefficient test and Regression Analysis based on enter method.

**Results:** Mean value for age was decided to be at  $13.98 \pm 0.70$ . The results showed that there is a significant and negative relation between reappraisal as an adaptive emotion regulation strategy and somatoform symptoms. Reappraisal has a significantly negative effect on somatoform symptoms. The relation between likelihood TAF and moral TAF with somatoform was significant and positive ( $P < 0.05$ ) and likelihood TAF had significantly positive effect on somatoform.

**Conclusions:** Research findings lead to the conclusion that reappraisal and TAF likelihood play crucial role in prediction of somatoform disorder in female students.

**Keywords:** Somatoform Disorder, Emotional Regulation, Reappraisal, Thought-Action Fusion, TAF Likelihood

## Introduction

Global spread of diseases is changing. The change has started in the 1990s and is now accelerating. The main direction of the change is from contagious infections and malnourishment toward non-contagious illnesses and psychological disorders like somatoform disorder. Somatoform disorders cover a vast spectrum of diseases whose main feature is bodily signs and symptoms. Such disorders include mutual interactions where mind, in yet unspecified ways, issues various alarms whose effects seriously threaten patient's intelligence and stimulation of bodily problems. Furthermore, small (yet unknown) changes in neurochemicals and neurophysiology might come from unknown mental or cerebral mechanisms that cause the disease. In order to confirm bodily diagnosis, physicians turn to costly examinations and experiments or even surgery and they encounter patients' anger as soon as they suggest the probability of psychological basis for the disease. The prevalence of this disorder is considerably high among women and those under medical treatment (1). Emotion regulation strategies and Thought-Action Fusion (TAF) are among the main psychological factors which are effective in controlling the somatoform disorder.

Emotion regulation strategies are a psychological component which provoked many researches including those on childhood and adolescent disorders [2]. Emotion regulation refers to those strategies which are used to reduce, boost, or maintain emotional experiences [3]. New evidence concerning psychological disorders indicates that malfunctioning of emotion regulation may be a central factor in the creation and endurance of such disorders [4]. In their study, *Andrei & Petrides* proved that bodily complaints have positive relation with negative emotions while they have negative relation with emotion regulation [5]. *Rieffe* et al. conducted a study on children with Autism Spectrum Disorder and argued that emotional consciousness (the ability to categorize one's and others' emotions and to act accordingly) has inverse relation with bodily complaints of this group of children [6]. *Hughes & Gullone* found that a positive relation exists between maladaptive and adaptive solutions on one hand and somatoform disorders on the other hand. *Hughes & Gullone* also found that there exists a negative relation between maladaptive and adaptive solutions on one hand and body dysmorphic disorder on the other hand [7]. However various studies indicate that understanding one's and others' emotions and adaptive strategies of emotional regulation have negative relation with psychological disorders while defects in emotional adjustment has positive relation with psychological disorders [8].

Meta cognitive constructs like thought-action fusion have gained a prominent position in new theories of psychological disorders. Thought-action fusion is a psychological phenomenon in which thoughts and related actions are considered equal [9]. Primary studies indicated that TAF construct has two main facets: TAF likelihood and moral TAF. Likelihood TAF signifies the individual's belief that thinking about a turbulent or unwelcome event makes it more likely to happen. Moral TAF, on the other hand, refers to the idea that having compulsive thoughts about taboos and actually committing them are not morally different [9]. The significance of Meta cognitive perceptions like TAF has been approved for pathology of disorders such as thought-action compulsions [10], depression [11], social anxiety, alienation and phobia [12], life quality and happiness level of below [13]. Nevertheless, the impact of these perceptions on somatoform disorders have not been studied enough. Initial evidence suggests that Meta cognitive perceptions may cause somatoform disorders. As an example, unwanted, passive, and recurrent thoughts together with automatic negative thoughts are positive and significant indexes of symptoms and signs of body dysmorphic disorder [14]. Another study confirmed that subjects with symptoms of high body dysmorphic disorder describe beliefs in which high tension and anguish over their appearance make them keep their agitating and hateful thoughts and also use defective methods of thought control to counter these thoughts [15].

Given the increasing attention to methods like emotional regulation and Meta cognitive models, most

national and foreign researches have focused on anxiety disorders and depression. Consequently no study has explored the relation between somatoform disorders with emotional regulation and thought-action fusion. Hence, this study aims at predicting the somatoform disorders, regarding the emotion regulation and TAF in female students of Savadkuh County.

## Methods

The method of descriptive research is of a correlation type (regression analysis) where emotional regulation and thought-action fusion are independent variables and somatoform disorder is a dependent variable. The research population included all middle school female students of Savadkuh County in the school year 2012-2013; given the high prevalence of somatoform disorder in teenage girls, they were selected as the research population and sample. In correlative research, large sample size leads to fake significance of small correlation values, so 30 to 100 subjects is the ideal range for correlation researches [16]. Therefore, and given the probable drop in number of subjects, 120 people were selected through a multistage cluster sampling. To do so, first the county was divided into five regions (north, south, east, west, and center) out of which two random regions were selected. Then, two schools were selected and randomly specified in each of these two regions. 30 students were randomly selected out of the remaining four schools. These students were selected according to criteria like 13-15 years of age and same education (60 second graders and 60 third graders). Questionnaires were filled out in classes as the researcher supervised the procedure. Finally, unqualified questionnaires were omitted and 110 questionnaires were taken into data analysis.

Full name of subjects were not required for privacy reasons and all participants were assured on the classified nature of the experiment data.

Questionnaires were distributed in groups after determining the sample. Researchers maintained a close correspondence with the participants and clarified occasional ambiguities and problems. To respect moral issues and persuade the subjects into full participation, they were informed that no piece of the collected data would be analyzed individually and that they are free to abandon and re-enter the procedure whenever they wanted. They were also told that they should not write down their names or code name (unless they seek to be informed about the final results).

Achenbach's Youth Self-Report Scale (YSR) on Behavior Problem Questionnaire: This questionnaire was used to assess the somatoform symptoms. This questionnaire was designed by Achenbach (1991) and is considered a popular screening tool for psychological disorders in youth. This questionnaire has been designed for 11-18 years old subjects with fifth grade in primary school education which must be filled out in 15 minutes [17]. Disorders were categorized according to DSM-IV-TR or Diagnostic and Statistical Manual of Mental Disorders- IV-

Text Reversion as follow: Obsessive-Compulsive Disorder, Somatoform Disorder, Attention Deficit Hyperactivity Disorder, Conduct Disorder, Oppositional Defiant Disorder, Normative Disorder. Comparative items of this questionnaire are answerable as Completely, Usually, and Never with scores of 2, 1, and 0 for them, respectively. Questionnaire validity was constantly tested. *Habibi-Asgharabad* et al. decided the correlation coefficient at 0.39-0.68 for YSR together with Eysenck Personality Questionnaire (Junior) and reported reliability coefficient for general problems was set at 0.93 [17]. *Kakaberaie* et al. used Cronbach's alpha to reliability of YSR and reported 0.92 for females, 0.95 for males and 0.82 for whole sample. They also used Cronbach's alpha to set YSR validity at 0.93 for high school first graders, 0.94 for high school second graders and 0.95 for high school third graders. In the study by *Kakaberaie* et al. the results of correlation between behavioral problems measured by Conners Rating Scale indicated a satisfactory criterion validity of YSR in high school students [18]. The reliability of somatoform subscale in this research has been calculated 0.77 through Cronbach's alpha test.

Emotional regulation questionnaire: This questionnaire was designed by *Gross & John* (2003) and consists of ten questions and two subscales: reappraisal (6 questions) and suppression (4 questions). The answers are rated according to on a 7-point Likert-type rating scale, rating from 1 (strongly disagree) to (strongly agree) 7. Cronbach's alpha coefficient for reappraisal was 0.79 and for suppression was 0.73 and validity of test-retest after 3 months for the whole scale was set at 0.69 (3). Internal consistency of the scale for state employees and Catholic students at Milan University for reappraisal fall into a range of 0.48 to 0.68 and for suppression from 0.42 to 0.63. Correlation coefficients were reported for reappraisal with positive emotions scale (0.24) and negative emotions (-0.14) and the correlation for suppression with positive emotions scale (-0.15) and negative emotions (0.04) (19). The reliability for reappraisal and suppression in this research have been calculated 0.79 and 0.81 through Cronbach's alpha test.

Thought-action fusion Questionnaire for youth: This questionnaire was designed by *Muris* et al. (2001) and consists of 15 questions and two subscale: TAF likelihood (7 questions) and TAF ethical (8 questions). The answers are rated according to 4-point Likert-type rating scale, rating from 1 (completely false) to 4 (completely true). Correlation coefficient were reported as follow: TAF likelihood scale for youth with *Speilberger* State – Trait Anxiety Inventory (STAI) for children (0.36) and Children's Depression Inventory (CDI) (0.33); TAF ethical scale for youth with *Speilberger* State – Trait Anxiety Inventory (STAI) for children (0.20) and Children's Depression Inventory (CDI) (0.19) [12]. The reliability for TAF likelihood and TAF ethical in this research have been calculated 0.83 and 0.80 through Cronbach's alpha test. It must be noted that question number 3 in thought-action fusion questionnaire for youth was omitted due to its irrelevance to our national religion and moral issues.

Statistical analysis

For data analysis SPSS V. 21 (Statistical Package for Social Science-Version 21), Pearson's correlation coefficient test, Multivariable Regression (inter method) were used and significance level was decided at  $P < 0.05$ .

Results

The mean age was  $13.98 \pm 0.70$ . Table 1 displays descriptive indexes of the research variables. Maximum mean belong to reappraisal ( $M=14.558$ ) and the minimum mean belongs to somatoform disorder ( $M=4.700$ ). The values for Skewness and kurtosis of variables are found to be between -2 and +2; these values indicate that results of the variables are satisfactory in terms of Skewness and kurtosis and no data transformation is needed to refine them and data analysis based on these indexes would not encounter any problem. It was also found that all the variables have natural distribution; so, Pearson correlation coefficient and multiple Regression Analysis can be safely used for analysis of results.

**Table 1.** correlation coefficients between somatoform symptoms and emotion regulation and thought-action fusion

| Variables               | 1        | 2     | 3      | 4       |
|-------------------------|----------|-------|--------|---------|
| Somatoform symptoms (1) | 1        |       |        |         |
| Reappraisal (2)         | -0.259** | 1     |        |         |
| Suppression (3)         | 0.039    | 0.055 | 1      |         |
| Likelihood TAF (4)      | 0.326**  | 0.105 | 0.124  | 1       |
| Moral TAF (5)           | 0.202**  | 0.005 | 0.235* | 0.574** |

\*\* $p < 0.01$

\* $p < 0.05$

As shown in table 1, results indicate that there is a significant, negative relation between somatoform symptoms and reappraisal as an adaptive vehicle for emotional regulation of female students ( $P < 0.01$ ). Also, there is a significant, positive relation between somatoform symptoms and likelihood TAF and moral TAF in female students ( $P < 0.01$ ). Somatoform symptoms have no significant relation with suppression as a maladaptive method in emotional regulation of students ( $P > 0.05$ ).

Diagram 1 shows Regression Standardized Residual on P-P diagram. The residual values form 45-degree line function; so normality of regression remains true. Also, presuppositions of the regression model were tested. In this respect, the Durbin-Watson test was used for the independence of errors; collinearity test with two indexes (tolerance and variance inflation factor) were also conducted. Result value of Durbin-Watson test was found to be 1.448, suggesting the independence of errors. Other specifications and presuppositions of regression are given in table 2 Collinearity indexes show that there exist no collinearity for predictive variables hence reliability of regression results.

Results shown in table 2 confirm that  $F=4.956$  is significant ( $P<0.001$ ) and emotion regulation and thought-action fusion solution helped determine 16% of the variance value for somatoform in female students ( $R^2=0.160$ ). Noting the t values, the impact coefficient ( $\beta$ ) of the research variables suggests reappraisal as an adaptive way to regulate emotion in inverse relation ( $\beta= -0.231$ ) and TAF likelihood as a component of thought-action fusion in direct relation ( $\beta=0.276$ ) can significantly predict somatoform disorder in female students. It was also found that suppression as a maladaptive emotion regulation strategy and moral TAF cannot significantly predict somatoform disorder in female students ( $P>0.05$ ).

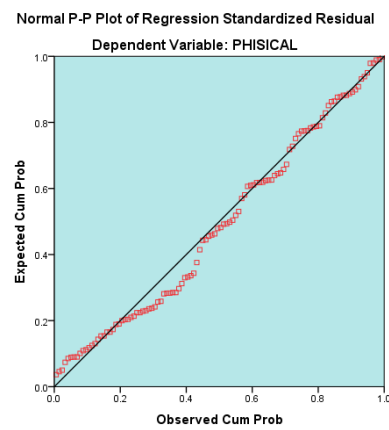


Diagram1. Regression Standardized Residual

Table 2. specifications of standard regression coefficient for prediction of somatoform through emotion regulation and thought-action fusion

| Model          | R     | R <sup>2</sup> | Adjust R <sup>2</sup> | SS      | df      | MS    | F     | Sig.  | B      | β      | T      | Sig.  | Collinearity Statistics |       |
|----------------|-------|----------------|-----------------------|---------|---------|-------|-------|-------|--------|--------|--------|-------|-------------------------|-------|
|                |       |                |                       |         |         |       |       |       |        |        |        |       | Tolerance               | VIF   |
| Constant       | -     | -              | -                     | -       | -       | -     | -     | -     | 5.681  | -      | 2.749  | 0.007 | -                       | -     |
| Reappraisal    |       |                |                       | 258.76  |         |       |       |       | -0.137 | -0.231 | -2.553 | 0.012 | 0.979                   | 1.021 |
| Suppression    | 0.399 | 0.160          | 0.130                 | 1323.14 | (105,4) | 64.69 | 4.956 | 0.001 | 0.014  | 0.020  | 0.215  | 0.830 | 0.941                   | 1.063 |
| likelihood TAF |       |                |                       | 1581.91 |         |       |       |       | 0.212  | 0.276  | 2.502  | 0.014 | 0.659                   | 1.518 |
| Moral TAF      |       |                |                       |         |         |       |       |       | 0.033  | 0.049  | 0.437  | 0.638 | 0.638                   | 1.567 |

Discussion

This research has been done with the purpose of studying the role of emotion regulation and TAF in predicting the somatoform disorder in female students. Research results showed that a negative relation exists between reappraisal as an adaptive method in regulating emotions and somatoform symptoms. Furthermore, reappraisal has a negative and significant effect on these symptoms. In other words, reappraisal constitutes a portion of the variance of somatoform symptoms and can predict it. These results are congruous with studies conducted by: Reiffe et al. which was based on the negative relation between awareness of emotion and somatoform complains of children with autism spectrum [6]; Gullone & Hughes which was based on inverse relation between adaptive methods of emotional regulation and somatoform disorder and physical deformation [7]. Results of the present study confirm what Andrei & Petrides found out in their study and proved that emotional intelligence has a negative relation with bodily complaints. Additionally, the findings of the present study are congruous with the results of Andrei & Petrides which proved that reappraisal has the potential to foresee the somatoform symptoms [5]. This finding matches a portion of the general model of emotional regulation [4]. In this model adaptive and standardized methods of emotional regulation serve as protectors and individuals' inability in using these methods leads to the emergence and continuance of various forms of mental pathology [4]. In this respect, research results have indicated that somatoform disorder patients tend to think more of the emotions related to bodily signs and have more

concentration on negative aspects of their physical conditions [1]. Researchers [3, 4] also found that reappraisal as an adaptive method of emotional regulation has a strong negative relation with fear and that thoughts which clearly entail terror of an experience are aggravated by fear of being negatively reappraised by other individuals and by feelings and emotions concerning negative events, hence these thoughts correspond with the rise of somatoform symptoms. On the other hand, mental models consider adaptive solutions for emotional regulation relevant to healthy outcomes, positive emotions, standardized psychology, effective connections, and better performance [4, 7]. This is while it can be said that reappraisal as an adaptive emotional regulator has a negative, reverse relation with somatoform disorder.

These results are also relevant to the ability to perceive, understand, and regulate emotions and are considered as principles of success in life and failure in emotion regulation would lead to consequences such as somatoform disorder. Reappraisal includes management of the relation with others which enhances the ability in adaptation and organization in challenging situations. Therefore, individuals with a developed ability in managing emotions can experience emotions or prevent them free of any pressure from within or without. On the other hand, individuals who lack such abilities cannot cope with the emotions or prevent them which are imposed from outside or inside [3] and as a result, are liable to psychological issues like somatoform disorder.

The results indicated the point that suppression as a negative emotional regulation strategy not only has no relation with somatoform symptoms, but also is

ineffective and unproductive; this is incongruent with *Reiffe* et al. which may be the outcome of cultural differences of participants or assessment error, hence more researches are required.

Results show that sub scales of likelihood TAF and moral TAF have a significantly positive relation with somatoform symptoms. Also, likelihood TAF plays a significant role in the prediction of somatoform signs but moral TAF does not. These findings are consistent with *Babamiri* et al., *Gordon* et al. and *Etu & Gary* [13, 14, 15]. According to the Meta cognitive model and to self-regulatory function model, psychological disorders are caused when defective Meta cognitive solutions, attention control, continuous processing, and self-regulation are used [20]. Therefore, it is probable that psychological disorders are related to aspects of beliefs and met cognitive solutions such as TAF. Meta cognitive beliefs like TAF lead to various mental and cognitive biases toward challenging activities and stimulations. This would increase individual's attention to these activities and challenges and consequently raise the challenging degree of internal or external stimulations [9]. Those with high TAF perceive more challenging activities and stimulations and display more neutralizing behaviors. In case of high TAF, for example, somatoform disorder patients feel more threatened and try to react by more counteractive behaviors and activity, hence their more reliance on visiting doctors. On the other hand, this finding is further proved by the fact that individuals deliberately assume that their negative thoughts are reacted to negative external events and this is one of the basic reasons why they seek to control their thoughts. Meta cognitive model says that the attempt to control thinking increases piercing thoughts (turbulent, repetitive thoughts about bodily defects and complaints) and necessary counteractions (visiting doctors for remedy). This result resembles *Wells & Mathews'* Meta cognitive model and also follows *Rachman's* theory on the role of Meta cognitive likelihood TAF of negative occurrences in more intensive concentration on such thoughts and the attempt to suppress them which itself aggravates the situation [15, 20]. In addition, if somebody believes that his thoughts may increase the probability of events, then he would always try to assure himself and reappraise his actions so that nothing happens [15]. Thus, likelihood TAF increases the somatoform disorder symptoms; regarding the findings and noting the theoretical fundamentals, it can be argued that TAF and its components, especially likelihood TAF, are related to somatoform disorder and cause the continuation of somatoform signs and symptoms.

Based on the findings of the present study, it is recommended that necessary programs and researches on psychological disorders like somatoform disorder be done so that it becomes clear how these psychological components (reappraisal and likelihood TAF) affect the disorders. Results of this research have important implications for prevention, cure, and counseling assistance to students. For instance, it is suggested that education be based on emotion regulation, emotional intelligence, and Meta cognitive intervention so that use

of adaptive solution of emotional regulation increases and defective Meta cognitive methods like TAF be removed. Further research with more versatile samples from other educational levels like primary school and also male students can bring about stronger evidence in favor of the role of emotion regulation and TAF in somatoform disorder. Like other studies, this study had limitations such as its narrow focus on urban region, educational level, and gender all of which forces a severe caution in the generalization of the results. Self-report limitation must also be added to this research.

## Conclusion

The general outputs that the results of this study offer, point to the fact that reappraisal as an adaptive emotion regulation strategy and likelihood TAF plays an important role in predicting somatoform disorder in female students. So, the results of this study provides further support for the role of likelihood TAF as an important factor in the persistence of somatoform disorder symptoms and positive and adaptive strategies of emotional regulation in reducing somatoform disorder symptoms in female students. The results of the present study, are similar to the Meta cognitive model and theoretical approaches of emotion regulation explaining somatoform disorder symptoms and showed that changes in negative Meta cognitive beliefs and increase of adaptive emotion regulation strategies can relieve somatoform disorder symptoms.

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