Psychological Achievements

The Role of Cognitive Emotion Regulation Strategies and Behavioral Activator-Inhibitor Systems in Depression of Female Students

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Citation:
Aliakbari Dehkordi, M., Aliakbari, M., Zolfagharinezhad, M., Hosseini, M., Balali, M. (2022). The role of cognitive emotion regulation strategies and behavioral activator-inhibitor systems in depression of female students, *Psychological Achievements, 29*(Special Issue), 15-26.

Abstract

Aim: This study aimed to investigate the role of cognitive emotion regulation strategies and behavioral activator-inhibitor systems in depression.

Methods: The research method was descriptive correlational with 240 female undergraduate and graduate students of Shahrekord University (Western province of Iran) selected through a random sampling method. They answered Beck Depression Inventory, Granovsky's Cognitive Emotion Regulation Questionnaire, and Carver and White's Brain Systems Scale. The data were analyzed using SPSS 22.

Results: The mean and standard deviation of each variable were calculated as descriptive statistics, and Pearson correlation was employed to evaluate the relationships of variables. The results showed a significant negative correlation between behavioral activator systems and depression, and a significant positive correlation between behavioral inhibitor systems and depression. In general, the behavioral activator-inhibitor systems predicted 33% of depression variance. In addition, there was a significant positive relationship between maladaptive strategies of cognitive emotion regulation and depression and a significant negative relationship between adaptive strategies of cognitive emotion regulation and depression.

Conclusion: The results showed that among the maladaptive strategies of cognitive emotion regulation, the catastrophic component predicted about 29% of depression variance, and among the adaptive strategies of cognitive emotion regulation, the acceptance component predicted about 39% of depression variance. In general, the results of this study indicated that brain-behavioral systems and emotional cognitive regulation strategies had chief roles in predicting depression. Relying on the findings of this study, we can present a practical framework to explain the symptoms of depression and its treatment.

1. Introduction

Depressive disorders are among the most common mental disorders with significant and negative effects on social functioning, job adequacy, education, and social life. Studies show that in recent decades, the prevalence of mental disorders throughout the world has been increasing. Among different social strata, the prevalence of depression is higher among the young population, especially students (Yu, Tian, Cui & Wu, 2021). Research on the occurrence of depression among students shows that the prevalence of depression among students is in the range of 10 to 85% with an average of 30%, and depressed students face more problems in their education than non-depressed students (Zeng, Wang, Xie, Hu & Reinhardt, 2019). Therefore, due to the increase in depression and the growing concern about causing emotional distress in students, identifying the factors affecting students' depression is very important (Zarei & Ismaili, 2021). In this regard, various studies show that the factors that cause the possibility of depressive disorders (risk factors) include environmental, genetic, and biological factors.

Cognitive theories of depression suggest that some abnormalities play a role in emotional control resulting from dysfunctional cognitive styles such as attention, rumination, and deficits in information processing and memory processes in the development of depression (Park et al., 2019).

More than 80% of people who experience signs of severe pathological mental disruption have a history of severe depression (Fang, Chan, Ross & Choi, 2020). Problems such as emotion regulation disorder (Aldao & Nolen-Hoeksema, 2010) and personality biomarkers (Gary 1991, 1994) are considered risk factors for depression in individuals.

Gary (1994, 1990) reviewed the animal research literature on the Reinforcement Sensitivity Theory (RST) and presented a biological model for the personality that includes three brain-behavioral systems and, according to Gary, is the basis for individual differences and the activity of each of them leads to the evocation of different emotional reactions such as fear and anxiety. The Reinforcement Sensitivity Theory (Gary & McNaughton, 2000) is based on the idea that three neurobiological systems enhance sensitivity: 1) Behavioral Activation System (BAS), which affects a person's sensitivity to rewards and makes a person sensitive to potential rewards. 2) Behavioral inhibition system (BIS) that makes a person sensitive to and avoids potential punishment. This system leads to anxiety, inhibition, and actionable avoidance in response to punitive cues and new stimuli and is known as the anxiety system.

In recent decades, Reinforcement Sensitivity Theory (RST), both original and revised, has been used to study psychiatric pathologies, focusing on depression, especially Major Depressive Disorder (MDD). Major depression can be reduced through a behavioral approach and diagnosed through a lack of motivation or positive reinforcement and an increase in inhibiting behavior (ccch ss cccial illl tt inn). Grry ddd Mggggg ggnn's Rii ff orcmm.. ssss itivity Teerr y (000)) is one of the most popular theories to examine the neural biological basis of mood disorders. Neurological models of emotional disorders, including depression, emphasize the central role of BAS and BIS. Studies with adult clinical populations using the original RST framework have shown that depression is associated with low BAS and high BIS (Malik, Sharp & Alfano 2014).

Empirically, several studies have shown that depression is characterized by dysfunction and disorders in the BAS. Some studies have shown that depression is only associated with higher levels of BIS activation, and some have reported depression with higher BIS activation and lower BAS activation (Li, Jing, Mi & Zhang, 2009). Behavioral inhibition systems are characterized by behavioral tendencies of fear and passivity such as introversion, depression, and anxiety that are activated in the face of symptoms of punishment and lack of rewards and new stimuli to create responses to inhibition and behavioral avoidance and create feelings of anxiety and arousal (Abedzadeh, Jajarmi & Hojjat, 2021).

Research has shown that Deficiency in emotion cognitive regulation and negative emotion regulation strategies are among the main factors in the etiology of depression (Basharpour, Atard & Eini, 2017; Salehi, 2015; Jorman & Gottlieb, 2010; Damaradka & Fajkowska, 2018; Garnowski & Kraj, 2006). Meigouni (2018), in his research, showed that rumination increases the risk of depression by preventing the use of more adaptive options, such as problem-solving.

Gross (1998) introduces emotion regulation strategy as a process by which people influence their emotions and their ways of experiencing and expressing them. The ability in emotion cognition regulation is a chief socio-emotional skill that enables flexibility in emotion-provoking situations (Young, Sandman & Crock, 2019). Emotion-cognitive regulation strategies are significant in managing or regulating emotions and maintaining control over emotions during or after exposure to threatening and stressful situations (Garnowski & Craig, 2019). Cognitive emotion regulation strategies are divided into two groups positive and negative strategies. Positive strategies include acceptance, refocusing on planning, positive refocusing, and positive reappraisal that leads to improved self-esteem and social competence. Negative strategies include self-blame, others-blame, rumination, and catastrophic thoughts which are maladaptive strategies to cope with stressful occasions and ultimately lead to stress, depression, and other psychological trauma (Smith et al., 2019).

Many studies have shown that emotion regulation strategies affect depression; Kraaij & Granefski, 2015; Joorman & Avanzato, 2010; Hafman et al., 2012). Maladaptive emotion regulation and deficits in adaptive emotion regulation are strongly associated with depression and may be factors that predict vulnerability to depression (Lee et al., 2015). Also, people with more cognitive emotion regulation experience less stress (Mousavi & Ramezani, 2018).

Increased use of maladaptive strategies is associated with the pathology and persistence of disorders and anxiety (Wayne, Bernstein & Nolan Hoxma, 2019). Behavioral brain system activity and applying different cognitive emotion regulation styles are involved in developing various disorders. Studies show that the behavioral brain system activity affects the selection of emotion regulation styles (Izadpanah & Schumacher, 2016, 2017; Li et al., 2015).

2. Objectives

According to studies on the activity of the BIS / BAS system and cognitive emotion regulation, the question arises 'how much the individual's mood is affected by the activation of each of these systems, and how much it is due to the effect of these systems on emotion and its regulation?'.

The findings of this study can be beneficial for teachers, instructors, and administrators - who are the chief curriculum planners in universities and schools - as well as therapists to promote the community's mental health.

In general, this study conceptually seeks to answer this question: to what extent are the psychological variables of cognitive emotion regulation and behavioral activator/inhibitor systems involved in explaining depression and its severity?

3. Methods
3.1. Sample and Procedure

The research method was descriptive-correlational. Pearson correlation coefficient and multivariate regression were applied to test the research hypotheses. The statistical population of the research included all female students of Shahrekord University in the

academic year 2021. The samples were 240 students selected through a purposeful sampling method. First, the researcher explained the necessary information about the objectives of the research and the participation and cooperation of students, and the questionnaires were provided to the students who had the inclusion criteria.

The inclusion criteria of the study were: 1) the consent of the samples to participate in the study, 2) the ability to provide the required information in the questionnaires, and 3) being currently undergraduate or graduate students at Shahrekord University.

The exclusion criteria included: 1) the declaration of dissatisfaction with cooperation by the subject, 2) answering the questionnaires incompletely, 3) having an acute mental or physical illness, 4) age over 50 years, and 5) the foreigners studying at Shahrekord University.

3.2. Research Tools

In this study, the questionnaires of depression, behavior inhibition/ activation systems, and cognitive emotion regulation were used.

3.2.1. Beck Depression Inventory-II (BDI-II)

Beck Depression Inventory-II is a 21-item self-assessment questionnaire that measures the severity of depressive symptoms in people over 13 years old. Each item (the sign of the disease) is divided into four scores from zero to three based on its severity, on which a score of zero indicates the lowest rate and a score of three shows the highest degree of depression. On this scale, the sum of the scores ranges between 0 and 63 (Rahimi, 2014). In this research, the translated questionnaire by Qasemzadeh et al. (2005) was applied. The convergence validity of BDI-II was calculated by the Hamilton Rating Scale of Depression (HRSD) (r = 0.71). Also, the reliability of the test-retest of this questionnaire after one week was reported at 0.93 (Beck, Steer & Brown, 1996). In the study by Ghasemzadeh et al. in Iran, Cronbach's alpha coefficient was 0.87 and the test-retest reliability was 0.74 (Rahimi, 2013).

3.2.1. Cognitive Emotion Regulation Questionnaire (CERQ)

This questionnaire is a multidimensional scale developed by Granefski et al. (2002) and is applied to identify cognitive coping strategies of individuals after experiencing unpleasant events or situations. Unlike other coping questionnaires that do not explicitly distinguish between a person's thoughts and actual actions, this questionnaire assesses a person's thoughts after a negative experience or traumatic event. This questionnaire is a self-report tool usable for people over 12 years old (both ordinary people and clinical patients), which includes 36 five-point grading items (from always to never) that assess nine subscale :Self-blame (questions 1-10-19-28 / Cronbach's alpha 0.87), acceptance (questions 2-11-20-29 / Cronbach's alpha 0.80), rumination (questions 3-12-21-30 / Cronbach's alpha 0.85), positive refocusing (questions 31-22-4-13/Cronbach's alpha 0.77), refocusing on planning (questions 5-14-23-32/Cronbach's alpha 0.81), positive reappraisal (Questions 6-15-24-33/Cronbach's alpha 0.85), perspective taking 7-16-25-34/Cronbach's alpha 0.79), catastrophizing (questions 35-8-17-26/Cronbach's alpha 0.82) , blaming others (questions 9-18-27-36/Cronbach's alpha 0.82) (Hasani 2018, quoted by Zare 2018). The alpha coefficient for the subscales of this questionnaire obtained by Granefski et al. (2002) ranged from 0.71 to 0.81 and the validity coefficient of its subscales by retesting 14 months was in the range of 0.48 to 0.61. In Iran, Salehi and Sadeghi (1389) found the alpha coefficient for the subscales of this test in the range of 0.62 to 0.91, as well as the reliability coefficient of these factors in the retest method with a time interval of one week between 0.75 and 0.88.

3.2.3. Carver and White's Behavior Inhibition/ Activation Systems Questionnaire

The BIS / BAS Scale (Carver & White 1994) is a 24-item self-report scale. The BIS subscale in this questionnaire includes seven items that measure the sensitivity of the behavioral inhibition system in response to threatening symptoms. The BAS subscale includes thirteen items that assess the sensitivity of the behavioral activation system. The BAS in this questionnaire includes three subscales of the past (4 questions), response to rewards (5 questions), and entertainment search (4 questions). The items are ranked on a four-point scale by the subject. The internal reliability of the BIS and BAS scales are 0.74 and 0.71, respectively (Carver White, 1994). Also, its obtained construct validity was appropriate (Poitris et al., 2008, quoted by Karsazi, 2015). The Persian version of this scale, which was validated on students, and its validity was reported by the test-retest method for the BAS subscale, 0.68 and for the BIS subscale, 0.71 (Mohammadi 2017).

3.3. Ethical Consideration

Before initiating the work, the researchers considered the student's consent or unwillingness to participate in the research and explained the completion of the questionnaires, the objectives of the study, and the research method for the participants. The candidates were also assured that their private and personal information would be kept confidential, and the findings would be explained to them if they wished. Then, they ensured that participation in the research would not impose any financial burden on them.

3.4. Data Analysis

To collect data, the researcher was present in the context, explained the purpose of the study to the participants, and administered the questionnaires. For more encouragement of students, the researcher asked them to provide an email address to send the test results. After completing the questionnaires by the students, the researcher collected them.

   Data were analyzed at descriptive and inferential statistics using SPSS software version 22. In descriptive statistics, the mean and standard deviation of variables were obtained. Pearson correlation was applied to assess the correlation between depression and BIS / BAS values and cognitive emotion regulation strategies.

4. Results

Demographic Information

The demographic data of age, education, and marital status of the individuals are presented here. The mean and standard deviation of the age of participants were 26.53 and 7.25, respectively. Out of 240 participants, 60 were at the postgraduate level with a frequency of 25%, 128 with a bachelor's degree with 53.3% frequency, and 52 with a master's degree with 21.7% frequency. Also, out of 240 participants, 104 were married with a frequency of 43.3%, 132 were single with a frequency of 55%, and four were divorced with a frequency of 1.7%.

   As seen in Table 1, the mean of the depression variable is 15.33, and the standard deviation is 9.3. The mean and standard deviation of the behavioral inhibition system are16.05 and 2.81, and the mean and standard deviation of the behavioral activation system are 38.9 and 9.22, respectively.

   The mean and standard deviation of self-blame are 11.66 and 3.46, the mean and standard deviation of ruminant are 13.68 and 3.34, the mean and standard deviation of catastrophizing are 10.46 and 3.09, and the mean and standard deviation of others-blaming are 19.43 and 2.43.

Table 1. Mean and standard deviation of research variables

Research variables	Mean	SD	Minimum	Maximum
Depression	15.33	9.3	0	34
Behavioral Inhibition System	16.05	2.81	12	21
Behavioral Activation System	38.9	9.22	14	51
Maladaptive cognitive emotion regulation strategies				
Self-blame	11.66	3.46	4	20
Rumination	13.68	3.34	5	20
Catastrophizing	10.46	3.09	7	19
Others-blame	19.43	2.43	4	16
Adaptive cognitive emotion regulation				
Self-acceptance	12.83	2.76	7	19
Positive refocus	11.88	3.83	4	20
Refocus on planning	14.3	3.4	7	20
Positive Reappraisal	13.03	3.3	4	20
Visibility	11.76	2.6	5	17

The mean and standard deviation of acceptance are 12.83 and 2.76, the mean and standard deviation of positive refocusing are 11.88 and 3.83, the mean and standard deviation of refocusing on planning are 14.3 and 3.5, the mean and standard deviation of positive reappraisal are 13.03 and 3.3, and the mean and standard deviation of visibility were 11.76 and 2.6, respectively.

The results of the inferential analysis are explained in this part. Pearson correlation coefficient was applied to calculate the relationship between the research variables and the depression of the participants. The results are summarized in Table 2.

Table 2. Correlation matrix between research variables and depression

Variable	Correlation coefficient with depression	Sig. level
Behavioral activation systems	**-0.497	0.0001
Behavioral inhibition systems	**0.398	0.002
maladaptive cognitive emotion regulation strategies		
Self-blame	*0.298	0.025
Rumination	**0.345	0.007
Catastrophizing	**0.485	0.0001
Others-blame	0.223	0.086
adaptive cognitive emotion regulation		
Self-acceptance	**0409	0.001
Positive refocus	**-0.405	0.001
Refocus on planning	*-0.294	0.022
Positive Reappraisal	*-0.304	0.018
Visibility	-0.216	0.098

As the results of Table 2 show, there is a significant negative correlation between behavioral activation systems and depression (p = 0.0001; r = -0.49) and a positive and significant correlation between behavioral inhibition systems and depression (p = 0.002; r = 0.39).

There is a positive and significant correlation between self-blame (p= 0.025; r = 0.29), rumination (p= 0.007; r = 0.34), and catastrophizing (p= 0.001; r = 0.48) with depression, but no significant relationship between others-blaming (p= 0.08; r = 0.22) and depression.

There is a significant negative correlation between positive refocusing (p = 0.001; r = 0.405), refocusing on planning (p = 0.02; r = -0.29), and positive reappraisal (p = 0.01; r = 0.3) with depression, while there is no significant relationship between visibility and depression (p = 0.09; r = -0.216). The results also showed that there was a significant positive relationship between acceptance component (p = 0.001; r = 0.409) and depression.

Also, multivariate regression was employed to investigate the predictive role of the studied variables in depression; the results are shown in tables 3, 4, and 5.

Table 3. Summary of Multivariate Regression Results of Behavioral Inhibition and Activation Systems on Depression

Predictive variable	B	ß	T	P	R	R square	F	P
Behavioral Activation System	0.985	0.298	2.67	0.01	0575	0.331	14.09	0.0001
Behavioral Inhibition System	-0.431	-0.427	-3.83	0.0001				

As Table 3 demonstrates, behavioral inhibitor/activator systems and depression variables were entered into the analysis concurrently. According to the results obtained for behavioral inhibitory systems (p = 0.01, 29 = 0.298) and behavioral activation systems (ß=-0.442, p = 0.0001), we can state that the behavioral inhibition and activation systems predict 33% of the variance in depression.

Table 4. Summary of multivariate regression results of maladaptive cognitive emotion regulation strategies on depression

Predictive variable	B	ß	T	P	R	R square	F	P
Self-blame	0.476	0.177	1.31	0.195	0.535	0.286	7.46	0.0001
Rumination	0.23	0.083	0.56	0.572				
Catastrophizing	1.27	0.425	3.45	0.001				

As seen in Table 4, the variables of self-blame, rumination, catastrophizing, and depression were entered into the analysis simultaneously. According to the results obtained for self-blame (p = 0.19, ß= 0.17), rumination (p = 0.57, ß= 0.08), and catastrophizing (p= 0.001, ß= 0.42), it can be stated that among the maladaptive strategies, only catastrophizing can predict about 29% of the variance of depression.

Table 5. Summary of multivariate regression results of adaptive cognitive emotion regulation strategies on depression

Predictive variable	B	ß	T	P	R	R square	F	P
Acceptance	-1.73	0.516	-4.407	0.0001	0.625	0.391	8.82	0.0001
Positive refocus	-0.457	0.188	-1.28	0.204				
Refocusing on planning	-0.836	0.305	-1.68	0.098				
Positive Reappraisal	-0.131	-0.047	-0.317	0.752				

As shown in Table 5, the variables of acceptance, positive refocusing, refocusing on planning, positive reappraisal, and depression entered the analysis simultaneously. According to the results obtained for acceptance (p = 0.0001, ß= 0.51), positive refocusing (p = 0.2, ß= 0.18), refocusing on planning (p = 0.09, ß= 0.3), and positive reappraisal (p = 0.75, ß=-0.04), it can be stated that among the adaptive strategies, only the acceptance component can predict about 39% of the variance of depression.

5. Discussion

Hypothesis 1

There is a relationship between behavioral activator and inhibitor systems and depression.

The Pearson correlation coefficient was applied to calculate the relationship between the research variables. The results of the analysis indicate a significant relationship between the variables. The significance level obtained is less than 0.05, showing that the relationship between the two variables is meaningful. Thus, the first hypothesis is confirmed, and the null hypothesis is rejected. The results showed a significant negative relationship between behavioral activation systems and depression and a significant positive correlation between behavioral inhibition systems and depression. The results of this study also show that behavioral activation and inhibitory systems can predict about 33% of the variance of depression.

Based on these findings, depressive symptoms increase with increasing BIS activity and decreasing BAS activity. The results of the relationship between BIS and BAS with depression in this study are consistent with the results of previous studies (McFarland et al. (2006), Pento Meso et al. (2006), Lee et al. (2015), Hosseini et al. (2016), Godari and Rashmi (2017), and Tajikzadeh et al. (2015), and part of it is in line with the research of Milik (2014) and.

In Hosseini and Almasi's (2016) research, the results showed that the behavioral inhibitor system is a positive and significant predictor of depression in adolescents. This result is consistent with the results of this hypothesis. The results of this study can be explainable in terms of Gary's personality theory (2004). In explaining his theory, Gary introduces the BAS system with positive emotions and positive behavioral tendencies such as extroversion and the BIS system with negative emotions and behavioral reactions such as fear, passivity, introversion, despair, depression, and anxiety (Coor & McNaton, 2008). Fowles (2000) associates the activity of the behavioral inhibition system with failure and anxiety, while the behavioral activation system is associated with hope and relief. BAS activity leads the person to face some confrontations and attempt to remove obstacles to seek pleasant goals. In contrast, the dominance and high sensitivity of the BIS system lead to helplessness (according to Seligman's learned helplessness theory about depression) and the symptoms of depression (Tajikzadeh et al., 2015). In Gary's biological model, biological and temperamental differences in BAS can predict the individuals' sensitivity to rewarding stimuli, and the biological personality differences in BIS can predict the individuals' sensitivity to punishment.

Hypothesis 2

There is a relationship between maladaptive cognitive emotion regulation strategies and depression.

To test the hypothesis, the Pearson correlation coefficient analysis between two variables of maladaptive cognitive emotion regulation strategies (including self-blame, rumination, catastrophe, and others-blame) and depression indicates a positive and significant relationship between them. The finding also showed that from the maladaptive strategies, only the catastrophic component could predict about 29% of the variance of depression. This finding is consistent with previous research (Garnowski & Craig, 2006, 2009; Maine, 2013; Breaking, 2014; Zare & Solgi, 2011; Arianakia, 2014; Salehi, 2015; Izadpanah, 2017; Richardson, 2017). Richardson (2017) showed a significant difference between the ability to positive and negative emotion regulation in controlling stress, and this different ability predicts different levels of depression and stress.

The findings of this study show that depression is affected by the strategies that people use to regulate their emotions. According to these findings, cognitive emotion regulation strategies such as catastrophizing, self-blaming, others-blaming, and rumination have a higher effect on depression. It means that the ways each person uses to regulate their emotions affect their emotional states. When a person encounters a problem, finds it catastrophic and terrifying, and passively gives up and ruminates, these cognitive methods will reinforce the negative and depressed moods. These findings are consistent with some researchers who have obtained results indicating the relationship between cognitive emotion regulation strategies and depression, including Aldao Venollen-Hokma (2010) and Salehi et al. (2011. 2015) in Iran. Based on the findings of this study, the persons' usual tendency to use some cognitive emotion regulation strategies affects their depression. Among them, the most correlation belongs to catastrophizing. People who call traumatic events horrible, catastrophic, or terrifying are more likely to become depressed. This strategy directly affects a person's emotional state. In some people, it manifests as a state of irritability and sensitivity to others, and in some, it appears as depression or sadness. Therefore, according to the results of this study, using these ineffective strategies yields negative emotional results and makes the person depressed.

Hypothesis 3

There is a relationship between adaptive cognitive emotion regulation strategies and depression.

The Pearson correlation coefficient was applied to test this hypothesis. Calculating the correlation coefficient between the two variables of adaptive cognitive emotion regulation strategies (including acceptance, positive refocusing, refocusing on planning, positive reappraisal, and visibility) and depression indicates a relationship between them. This relationship is negatively significant for the components of positive refocusing, refocusing on planning, and positive reappraisal. However, the results showed that visibility has no meaningful relationship with depression. Testing this hypothesis showed that the component of acceptance has a significant positive correlation with depression. Also, the results of this study showed that among the adaptive strategies, only the acceptance component could predict about 39% of the variance of depression.

Consistent with the present study, in the studies of Pazouki et al. (2015) and Zare and Solgi (2013), there was a negative and significant relationship between refocusing on planning, positive reappraisal, and visibility with depression, and there was a positive and significant correlation between acceptance and depression. This finding on acceptance is contrary to the results of Zolomaki and Han (2010, quoted by Zare, 2013♀0. Generally, many researchers disagree on whether acceptance is an adaptive or maladaptive component. Accordingly, one can argue that it may not be correct to consider the acceptance subscale as an adaptive strategy. Another explanation yields that the data that make up the acceptance subscale (e.g., I am unable to change this situation) may reflect a degree of disappointment. So, acceptance may be an adaptive strategy only in certain circumstances and may depend on the mental state under consideration (Martin & Dahlen, 2010, quoted by Zare et al., 2013). The research literature also shows that chronic efforts to control, suppress, or avoid unwanted inner experiences and emotions (acceptance) may increase the frequency and intensity of emotional experiences (Zlomaki & Han 2010, quoted by Zare et al., 2013).

We can justify the relationship between cognitive emotion regulation strategies and depression based on the cognitive emotion regulation strategies model. In this model, non-

adaptive and uncompromising (negative) cognitive emotion regulation strategies lead to the emergence and persistence of various forms of psychological pathology, but adaptive and compromising (positive) cognitive emotion regulation strategies act as protective factors. Garnefski and Kraaij (2006) argue that people who use desirable styles such as positive reappraisal and focusing on planning are less vulnerable. Indeed, people who deal with distressing events do the best they can at the moment to cope with the situation or think about changing the conditions and start planning and taking action to solve the problem and get less depressed.

6. Limitation and Recommendation

Among the limitations to be mentioned in this study is not using interviews in addition to questionnaires. This research was conducted on a group of Shahrekord University students. Generalizing the findings to the general society based on the findings of this research should be done with caution. Another limitation of the research is that it is conducted in a short-term and cross-sectional manner. Considering the limitations of the research, the findings of the current research should be viewed with caution.

Researchers can use the RST-PQ scale (Kur, Cooper 2016), which is the latest version to measure sensitivity to reinforcement, in future research. It is also suggested to repeat the same research in other groups by introducing control variables such as anxiety, mental health, etc. In line with the application of the results of this research and to help people to improve their moods and mental health, it is suggested that educational programs based on emotion processing and management be developed with an emphasis on the optimal cognitive regulation of emotions, in which by targeting Identify the ineffective cognitive strategies of people and the incompatible measures that each person uses to regulate their emotions in different situations and use therapeutic and educational interventions to effectively regulate their emotions.

7. Conclusion

In general conclusion, we can say that according to the results of the present study, the activity of the behavioral brain system and the use of cognitive emotion regulation strategies affect the creation and prediction of the degree of depression. Also, as the BIS system activity increases negative emotion cognitive regulation strategies, this, in turn, increases the degree of depression in people.

We hope that the findings of this study will be helpful in understanding and identifying the preconditions affecting depression and mood disorders, given that people's mood levels have a significant impact on improving the quality of life and mental health of society and subsequent community development.

8. Author Contributions

In the present study; the research design, the process of data collection, analysis and interpretation of the findings, was done by all researchers and discussed with colleagues and professors of technology.

9. Acknowledgment

10. Conflicts of Interest
There are no conflicts of interest.

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