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Cognitive Emotion Regulation Strategies as Predictors of Depression among Adolescents

Md. Huzzatullah [a, *], Md. Shariful Islam [a], Umme Habiba [a]

[a] Department of Clinical Psychology, University of Rajshahi, Rajshahi-6205, Bangladesh

*Corresponding author Email: huzza.rubd@gmail.com

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Abstract: Depression is a serious public health concern among adolescents in Bangladesh and around the world, and it demands more attention, particularly in terms of identifying prevention and intervention strategies. The main purpose of the study was to determine the relationships between cognitive emotion regulation (CER) strategies and depression among adolescents. A total of 300 (161 boys and 139 girls) adolescents were selected randomly from 05 secondary schools in Rajshahi city, Bangladesh, as participants for the present study. The Bengali Adapted Version of CER Questionnaire and the Bangla Depression Scale were used to obtain the data for the present study. The obtained data were analyzed using mean, standard deviation, Pearson correlation, and multiple regression analysis through SPSS version 25. The findings of the study revealed that maladaptive CER strategies were positively related to depression while adaptive strategies were negatively related to depression among adolescents. Maladaptive CER strategies were positive predictors of depression, while adaptive strategies were negative predictors of depression among adolescents. Nine CER strategies explained 49.3 % variance in depression among adolescents. The findings of the research will be helpful in preventing and developing interventions for depression among adolescents, considering CER.

Keywords: Cognitive Emotion Regulation (CER), Adolescent Period, Adolescents, Depressed Adolescents

1. Introduction

"Adolescents", i.e. People in the transitional phase between childhood and adulthood, namely ages 10 to 19), are the future cornerstone of a nation, and they will play a significant part in the national progress. So, the development of secure mental health among adolescents is vital in order to devote to the development of a community or a nation. But the mental health of adolescents is interfered with by a wide range of issues. During adolescence, rapid mood shifts and emotional outbursts are more prevalent (Toenders *et al.,* 2024). Numerous physical, emotional, and social alterations, including encounters with abuse, poverty, or violence, can susceptible adolescents to mental health disorders (WHO, 2019). Adolescents present with a multitude of emotional issues (depression, anxiety, aggression, wrath, hostility, etc.) (Walsh *et al.,* 2017; Kumar et al., 2023).

Among the psychological disorders experienced by adolescents, depression is more common. During the adolescent period, people have to face many physical, social, and psychological challenges. They are confronted with many stressors and negative life events that cause various emotional problems; depression, anxiety, stress, aggression, and anger are common (Islam *et al.,* 2021). These emotional problems interfere with academic, social, and daily activities in the lives of adolescents. The poor concentration on study, poor social connectedness, physical fatigue, etc. are also noticed in depressed adolescents (Ria *et al.,* 2022).

Depression is an unhappy condition in which problems seem overwhelming and life appears miserable (Comer, 2010). A recent study focused on adolescents in Bangladesh reported a prevalence of depression of 36.6% (Anjum *et al.,* 2019). Due to its high prevalence, coexistence with other mental illnesses like anxiety and conduct disorder etc. (Peterson *et al.,* 1993) tendency to be pervasive, impact of the illness, and consequences that can persist into adulthood, it is one of the most frequent and severe categories of mental disorders among adolescents (Clarck *et al.,* 2000; Peterson *et al.,* 1993). According to Arnarson and Craighead (2009), this disorder has a

detrimental effect on academic performance. At this age, 10% of suicide fatalities are caused by depression (Thapar *et al.,* 2012).

It has been shown frequently that poor cognitive capacity for emotional regulation may be linked to both the occurrence and persistence of mental health issues such as depression, anxiety, aggressive behavior, and so on (Pico Perez *et al.,* 2017). Insufficient capacity of emotion regulation has been found to be connected with the occurrence of anxiety and mood disorders (*ibid*) in addition to impaired mental well-being (Hu *et al.,* 2014). Adopting specific coping methods and mood-regulation techniques in adolescence will have considerable consequences on emotional development from adolescence to adulthood and emotional well-being (Guarino, 2011). The development of emotion regulation skills and an increase in adversity tend to occur throughout the lifespan. In adolescence, people start using more sophisticated emotion management strategies, as they grow more independent in controlling their emotions (Garnefski & Kraaij, 2006). But throughout this time, there are also difficult changes that might have an adverse effect that the adolescent must be able to control in order to avoid developing a depressive disorder (Hilt & Nolen-Hoeksema, 2009).

Cognitive emotion regulation (CER) refers to the regulation of emotion in a conscious manner (Garnesfski & Kraaij, 2007) by cognitive processes during or after experiencing a negative event (Garnesfski *et al.,* 2001). Garnefski and Kraaij (2006) define "cognitive emotion regulation" as mental approaches individuals utilize to deal with distressing or stressful circumstances. It can be viewed as "extrinsic and intrinsic mechanisms that are accountable for monitoring, evaluating, and modifying emotional reactions, particularly their severe and spatial features" (Thompson, 1994).

The most extensive model of CER strategies compiled by Garnefski *et al.* (2001) enumerates nine techniques used to regulate emotions: catastrophizing, ruminating, refocusing on planning, positive reappraisal, accepting one's circumstances, putting things in perspective, positive refocusing, and self-blame. *Self-blame* involves blaming oneself for one's experiences, attributing responsibility for what occurred to oneself, and becoming consumed with ideas about faults one carried out. *Acceptance* is the act of thinking that one cannot alter what occurred and that life will move on regardless of how one feels about it. *Rumination* is defined as having constant thoughts about and/or becoming preoccupied with the emotions and ideas connected to a terrible occurrence. *Positive Refocusing* means thinking of more enjoyable things instead of the current occurrence. *Refocusing on planning* means coming up with a strategy aimed at improving the situation or determining what actions to take in response to the incident. *Positive Reappraisal* involves psychologically giving an event a positive significance in terms of one’s personal development, believing that it makes him stronger, and seeking for the positive aspects of an experience. *Putting an event into perspective* involves saying that there are more catastrophic events in the world and downplaying how significant the occurrence is in comparison to other situations. *Catastrophizing* refers to the cognitive process whereby an individual engages in repetitive thoughts that exaggerate the severity of an unforeseen occurrence, perceiving their own experiences as the most distressing and incomparable compared to the experiences of others. *Other-blame* involves the thoughts of blaming others for his or her experiences, holding them accountable for what occurred, or contemplating the errors others have committed in this regard.

Cognitive emotion control approaches have been deliberately divided into adaptive and maladaptive groups, primarily based on their associations with clinical symptoms. Self-blame, Rumination, Catastrophizing, and blaming others are maladaptive CER methods. Acceptance, Positive refocusing, Refocusing on plans, Positive reappraisal, and Putting into perspective are adaptive (Garnefski *et al.,* 2001, 2002; Garnefski & Kraaij, 2007).

1.1 CER Strategies and Depression

Research evidence revealed that maladaptive strategies of CER namely Self-blame, Blaming others, Rumination and Catastrophizing, and are positively linked to depression and adaptive techniques of CER namely Putting into perspective, Positive refocusing, Refocusing on planning, Positive reprisal and Acceptance are negatively linked to depression among adolescents (Garnefski *et al.,*2017; Garnefski & Kraaij, 2006; Stikkelbroek *et al.,*2018; Garnefski *et al.* 2004; Martin *et al.*, 2005; Tanni *et al.*, 2021; Joshi & Mehta, 2020).

This study will explore the CER strategies associated with depression among adolescents. The identification of individual risk as well as protective factors linked to both the occurrence and persistance of emotional problems

like depression and the dissemination of this knowledge for intervention and prevention purposes are the primary objectives of this research. In the context of Bangladesh, a few studies were carried out in Bangladesh on the relationship of CER and depression. So, with this research it can be hoped to find suitable clues to minimize depression through psychological intervention considering CER strategies. It will be able to find out the CER strategies that are to be emphasized in practicing and those that are to be replaced in the daily lives of adolescents. Findings of this research will also provide knowledge that is crucial for mental health professionals, sociologists, NGOs, and policymakers to take effective steps to promote adolescent mental health conditions in Bangladesh.

1.2 CER Strategies and other Psychological Disorders

Besides Depression, CER Strategies are linked to anxiety disorders (Garnefski & Kraaij, 2016); Obsessive - Compulsive Disorder (Ferrández-Mas *et al.,* 2023); Post- traumatic Stress Disorder (Puechlong *et al.,* 2021); Borderline Personality Disorder (McLachlan *et al.,* 2022) and Eating Disorders (Babaei & Alizadeh, 2020).

1.3 Objectives

The specific objectives are:

I. To find out the relationship between cognitive emotion regulation strategies and depression among Bangladeshi adolescents.

II. To justify the cognitive emotion regulation strategies as predictors of depression among Bangladeshi adolescents.

III. To suggest ways of minimizing depression among Bangladeshi adolescents.

2. Method

2.1 Target Population and Participants

The target population of the present study were adolescent students of Rajshahi city, Bangladesh. They were students of class 9 and class 10 (9th and 10th grade), with ages ranging from 14 to 17.

A total of 300 adolescent students participated in the present study, with ages ranging from 14 to 17 years. The mean age of the participants was 15.3. Students of class 9 and class 10 were taken as participants for the convenience of the present study. 161 male and 139 female students participated in the present study.

2.2 Measuring Instruments

2.2.1 Personal Information Form

A demographic and personal information questionnaire was used to collect data about gender, academic year, age, family type and birth order of the participants.

2.2.2 The Bengali Adapted Version of CER Questionnaire (CERQ)

The Bengali Adapted Version of CERQ was used for the present study to measure CER strategies. The CERQ was originally developed by Garnefski *et al.* (2002). Ansary & Karim (2011) adapted CERQ in Bengali culture. CERQ is a five-point Likert scale from 1 (nearly never) to 5 (usually always) that measures nine adaptive and non-adaptive strategies with subscale scores from 04 to 20. Acceptance, positive reappraisal, positive refocusing, refocus on planning and putting things into perspective are adaptive coping methods, while self-blame, catastrophizing, rumination, and blaming others are maladaptive. Each of the four items that make up the subscales measure the cognitive ways of coping after experiencing a hazardous or stressful incident in their life. CERQ is a valid and reliable (Split-half reliability for the Bangla version of CERQ was found to be 0.78) in Bengali culture (Ansary & Karim, 2011). The score for each subscale was determined by summing the score of four items. Higher score on a specific subscale indicates the more use of that strategy, lower score indicates the less use of that strategy.

2.2.3 Bangla Depression Scale

The Bangla Depression Scale was employed for the study to measure depression. It was developed by Uddin and Rahman in 2005. It consists of 30 items. It is a five-point Likert type scale ranging from 1 (almost never) to 5 (almost always), and that is used to determine whether or not they were depressed, as well as the degree of their depression with a total score ranging from 30 to 150. It is both reliable (**α=** 0.70) and valid (Concurrent and Construct validity) in Bengali culture. The total score of each individual was obtained by summing the score of 30 items in the scale. A score of 94 or higher on this scale is considered indicative of depression for screening purposes. A higher score on this scale means a more severe state of depression, and lower score on this scale implies a less severe state of depression.

2.2.4 Design of the Study

Cross-sectional correlational design was employed in this research.

2.3 Procedure

The present study was carried out at five secondary schools in Rajshahi City, Bangladesh. A random sampling technique was employed to select the participants so that the relevant data could be obtained. Initially, the five secondary schools were selected randomly and approached for authorization to collect data. A letter was delivered to the authority of each school. A complete list of students of class 9 and class 10 was collected. A number was assigned to each student. Then 60 students were randomly selected from each school (30 students from class 9 and 30 students from class 10). A teacher was assigned by the authority of schools in each classroom to monitor the respondents. They were then briefed about the purpose and the significance of the study from the perspective of Bangladesh. Verbal consent was taken from the participants. Before administering the questionnaires, essential rapport was built with participants. Participants were guaranteed the privacy of their answers, and they were not asked to sign their identities on the instruments used to obtain data for the study. The booklet was then distributed among the students. They were instructed to go through the guidelines provided at the top of the first page of each questionnaire. Then the booklet was collected from participants. Students completed questionnaires during school hours. After completing their questionnaire, they were thanked for their cooperation.

2.4 Analysis of Data

Following the collection of raw data, responses were then coded and scored before being entered into a computer data file. The IBM Statistical Package for Social Science 25 (SPSS) computer program was utilized in order to carry out each and every statistical analysis.

2.5 Ethical Permission

For obtaining ethical permission to conduct the present study, the principal researcher of the study applied with necessary documents to the ethical committee of Institute of Biological Sciences, University of Rajshahi, Bangladesh (Memo no: 336(23)/320/IAMEBBC/IBSc). They reviewed the application and all necessary documents and provided permission for conducting the study.

3. Results

3.1 Descriptive Statistics of Variables

3.1.1 Depression Profile of Respondents

Bangla Depression Scale was utilized to measure Depression. The score of 94 or above was the cutoff point of depression on Bangla Depression scale. This means that score from 0 to 93 was indicated non-depressed and score from 94 to 150 was indicated as depressed. Depression profile of respondents is presented in the table 1.

Table 1. Depression Profile of Respondents

Depression	Frequency	Percent
Depressed	59	19.7
Non-Depressed	241	80.3
Total	300	100.0

From table 1, Among 300 respondents, 59 respondents (19.7%) were depressed and 241 respondents (80.3%) were not at the depression threshold.

3.1.2 Relationships between CER Strategies and Depression among Adolescents

The Bengali version of CER Questionnaire was used to measure CER strategies. There were nine CER strategies. *Pearson correlations* between nine CER strategies and depression was calculated on a total sample. Results of the correlation between CER strategies and depression are presented below in table 2.

From table 2, Maladaptive strategies of CER such as Self-blame (r = .546, p<0.01), Rumination (r = .559, p <0.01), Catastrophizing (r = .521, p<0.01), and Blaming others (r = .410 p< 0.01) had positive significant correlations with depression. The positive correlation between maladaptive strategies of CER and depression indicates that if maladaptive strategies increase, depression tends to increase or if depression increases, maladaptive strategies tend to increase.

Table 2. Pearson Correlations between Cognitive Emotion Regulation Strategies and Depression

Variables	1	2	3	4	5	6	7	8	9	10
Self - blame	1								*	
Acceptance	-.004	1								
Rumination	.647**	-.031	1							
Positive refocusing	-.506**	.006	-.435**	1						
Refocus on planning	-.419**	.039	-.347**	.595**	1					
Positive reappraisal	-.509**	-.039	-.488**	.522**	.537**	1				
Putting into perspective	-.356**	.113	-.424**	.479**	.467**	.490**	1			
Catastrophizing	.500**	.060	.538**	-.414**	-.330**	-.466**	-.288**	1		
Blaming others	.323**	.069	.361**	-.434**	-.332**	-.416**	-.229**	.322**	1	
Depression	.546**	.068	.559**	-.524**	-.451**	-.537**	-.399**	.521**	.410**	1

**p<0.01

Conversely, adaptive methods including Positive refocusing (r = -.524, p < 0.01), Refocus on planning (r = -.451, p < 0.01), Positive reappraisal (r = -.537, p < 0.01), and Putting into perspective (r = -.399, p < 0.01) demonstrated significant negative relationships with depression. Acceptance was not significantly correlated with depression. The negative correlation between adaptive strategies of CER and depression indicates that if adaptive strategies increase, depression tends to decrease or if depression decreases, adaptive strategies tend to increase.

3.1.3 CER Strategies as Predictors of Depression among Adolescents

Multiple Linear Regression between CER strategies and depression was performed on a total sample to justify CER strategies as predictors of depression among adolescents. Eight out of nine strategies were inserted into the regression model. Acceptance was not inserted into the regression model because Acceptance was not significantly

correlated with depression. The findings of the multiple regression analysis concerning CER strategies and depression are shown in Table 3 below.

Table 3. Multiple Regression Analysis Showing Amount of Variance in Depression Accounted for CER Strategies

Predictors	Standardized Coefficient Beta(β)	t	Explained total variance (R^2)	F
Self - blame	.130	2.173*	.493	35.304***
Rumination	.180	2.975**		
Positive refocusing	-.131	-2.196*		
Refocus on planning	-.077	-1.367		
Positive reappraisal	-.130	-2.222*		
Putting into perspective	-.041	-.779		
Catastrophizing	.175	3.325**		
Blaming others	.101	2.073*		

***P<0.001, **p<0.01, *p<0.05

The regression model was significant (F =35.304, p< 0.001). Considering the regression table (table 3), Maladaptive CER strategies such as Self -blame (β =.130, p<0.05), Rumination (β =.180, p<0.01), Catastrophizing (β =.175, p<0.01), and Blaming others (β =.101, p<0.05) were significant positive predictors of depression among adolescents.

Standardized beta (β) of .130 for Self -blame indicates that increasing one unit of Self -blame will increase depression by .130. Standardized beta (β) of .180 for Rumination indicates that increasing one unit of Rumination will increase depression by .180. Standardized beta (β) of .175 for Catastrophizing indicates that increasing one unit of Catastrophizing will increase depression by .175. Standardized beta (β) of .101 for Blaming others indicates that increasing one unit of Blaming others will increase depression by .101.On the other hand, considering the regression table (table 4), Positive refocusing (β =-.131, p<0.01), and Positive reappraisal (β =-.130 p<0.01) were the negative predictors of depression among adolescents. Depression was not significantly predicted by the other two adaptive methods, namely, Refocusing on planning and Putting into perspective.

Standardized beta (β) of -.131 for Positive refocusing indicates that increasing one unit of Refocus on planning will decrease depression by-. 131. Considering the value of R^2 from the regression table (table 3), nine cognitive emotion regulation strategies explained 49.3 % variance in depression score.

4. Discussion

Depression is a very common public health problem among adolescents. The aim of the current study was to investigate the relationships between the CER strategies and depression among adolescents. The study was conducted on 300 adolescent students randomly selected from five schools in Rajshahi city. The Bangali Adapted Version of CERQ (Ansary & Karim, 2011) was used to assess CER, Bangla Depression Scale (Uddin & Rahman, 2005) was used to measure depression.

First objective of the study was to find out the relationship between CER strategies and depression among Bangladeshi adolescents. The present study found that maladaptive CER methods namely Self-blame, Rumination, Catastrophizing, and Blaming others were positively connected with depression in adolescents. However, adaptive CER methods like Positive refocusing, Putting into perspective, Refocusing on planning, and Positive reappraisal were adversely connected with depression in adolescents. Acceptance was not correlated with depression in the present study.

These findings aligned with prior research in this field of study. Garnefski & Kraaij (2006) discovered that Rumination and Catastrophizing had a positive correlation with symptoms of depression, whereas Positive Reappraisal demonstrated a negative correlation with depressive symptoms. Öngen (2010) also found that maladaptive CER methods namely Catastrophizing, Rumination, Self- blame and Blaming others were positively related and adaptive methods namely Positive reappraisal, Positive refocusing, Refocusing on planning, and Putting into perspective were negatively related with depression among adolescents. Moreover, some other previous studies also showed similar findings that maladaptive CER strategies have positive and adaptive strategies of CER have negative relationship with depression (Garnefski *et al.,* 2002; Garnefski *et al.,* 2004; Stikkelbroek, *et al.,* 2018; Garnefski *et al.,* 2003; Garnefski *et al.* 2007; Joshi & Mehta, 2020; Duarte *et al.*, 2015; Van Den Heuvel *al.*, 2020; Garnefski *et al.,* 2017; Tanni *et al.,*2021).

Findings of the present study provided some support for theoretical assumptions. Adolescents who use maladaptive CER strategies have cognitive bias and deficits (Sfärlea *et al.,*2021).When confronted with situations that make one feel emotionally reactive, these cognitive biases and deficiencies can make it hard to see things in a positive light (Joormann & Stanton, 2016) and lead to intrusive thoughts that are hard to control (Carver & Johnson, 2018).

According to Beck's (1976) Cognitive theory of depression, intrusive thoughts and cognitive bias increase the likelihood of a person experiencing and sustaining depression. While adaptive emotion management is negatively correlated with cognitive bias (Sfärlea *et al.,* 2021) which minimizes the chance of depression.

The results also offered partial support for the cognitive content-specificity hypothesis (Beck *et al.,* 1987). This paradigm posits that depression is distinctly marked by negative self-assessments and unfavorable perceptions of past and future occurrences. This model posited that cognitive strategies such as self-blame and rumination would be the primary correlates of depressive symptoms, a hypothesis supported by the findings of the current study.

The second objective of the study was to justify the CER strategies as predictors of depression among Bangladeshi adolescents. Findings of the study revealed that maladaptive CER methods like Catastrophizing, Self-blaming, Rumination, and blaming others were significant positive predictors of depression among adolescents. Conversely, adaptive CER methods such as Positive refocusing, Positive reappraisal were significant negative predictors of depression among adolescents. Other two adaptive methods namely Refocusing on planning and Putting into perspective were not significant predictors of depression among adolescents in the present study. Results also revealed that CER strategies explained 49.3 % variance in depression score.

These findings aligned with prior research in this field of study. Garnefski *et al.* (2004) discovered that maladaptive strategies such as catastrophizing, self-blame, and rumination positively predicted depression, while positive reappraisal negatively predicted depression. These strategies in addition with age gender explained 47.6% of variance in depression. In another study, Garnefski *et al.* (2003) discovered that rumination, self-blame, and catastrophizing directly predicted depression, whereas positive reappraisal and putting into perspective indirectly predicted depression.

These strategies explained 42.6% of the variance in depressive symptoms. Martin *et al.* (2005) discovered that rumination, self-blame and catastrophizing positively predicted depression, whereas positive refocusing, positive reappraisal negatively predicted depression.

Moreover, other studies also showed similar findings that maladaptive CER strategies are positive and adaptive strategies are negative significant predictors of depression among adolescents (Garnefski *et al.,* 2017; Mehta & Joshi, 2017; Peña & Pacheco, 2012; Öngen, 2010).

CER strategies contribute to develop other psychological disorder among adolescents such as catastrophizing and other-blame are associated with anxiety disorders (Garnefski & Kraaij, 2016) ; maladaptive CERS such as catastrophizing, self-blame, and rumination are linked to the obsessive–compulsive symptoms ,on the contrary adaptive CERS like refocus on planning acts like protective factor obsessive–compulsive symptoms (Ferrández-Mas *et al.,* 2023) ; catastrophizing acts as a risk factors and putting into perspective and positive reappraisal strategies plays a role as protective factor for PTSD symptoms (Puechlong *et al.,* 2021).

The findings of the study revealed that adaptive strategies of CER such as Positive refocusing, Positive reappraisal contribute as protective factors of depression among adolescents in Bangladesh. If these strategies are emphasized in emotion regulation training among adolescents, the onset and persistence of depression can be minimized.

5. Recommendations for Future Research

In the context of Bangladesh, a few studies were carried out in Bangladesh on the relationship of CER and depression. So, further research should be done on this topic to confirm findings of present study. Further research is needed to understand the process through which CER strategies interact with depression among adolescents. The findings now need to be replicated and validated in a more diverse sample of adolescents. A study on large samples should be conducted in order to reduce systematic error. Additionally, longitudinal studies would be beneficial for establishing causal relationships between the variables. Finally, a more thorough investigation is required into any gender variations pertaining to risk factors for depression among young adults.

6. Conclusion and Suggestions

The goal of the study was to broaden previous findings by examining non-clinical adolescent samples to determine the precise relationship between CER techniques and depression among adolescents. Participants of the study were 300 randomly selected adolescent students of Rajshahi city. The present study will enrich the literature of psychology in the prospective of Bangladesh, because very few studies were carried out on the relation of CER with depression in a Bangladeshi sample.

According to the findings of the current study, the adoption of maladaptive CER techniques was found to be factors that increase risk for depression in adolescents. On other hand, adaptive CER strategies were protective factors for depression among adolescents.

The findings of the study offer suggestions to develop an approach to intervention aimed at improving mental health. Previous research has indicated that CER strategies were more strongly connected with psychopathology than adaptive strategies (Garnefski *et al.,* 2001). Earlier studies have established that interventions that target the modification of maladaptive emotion regulation yield universally beneficial outcomes (Fresco *et al.,* 2013). The current investigation discovered evidence of a connection between CER and depression among adolescents in Bangladesh. The results of this study will also help with the approach for crisis intervention of adolescents. To prevent and reduce depression among adolescents, psychotherapists may implement an adaptive CER strategy plan during individual and group treatment sessions. Findings of this research will also provide knowledge that is crucial for mental health professionals, sociologists, NGOs, and policymakers to take effective steps to promote adolescents' mental health conditions in Bangladesh.

Findings of the present study indicated that maladaptive CER strategies lead adolescence to various psychological problems like depression. From these findings, it can be suggested that intervention focusing on CER on techniques will be an effective way to prevent developing and treating psychopathology among adolescents. Altering maladaptive ways of regulating emotion with adaptive ways should take consideration into psychological intervention. As a prevention program, it should teach adolescents the adaptive ways of emotion regulation through cognition because adaptive ways of regulating emotion act as protective factors for psychopathology.

It can be suggested to the parents that they should teach and encourage their children to use adaptive ways of CER and discourage their children to use maladaptive ways of CER to keep better mental health conditions among adolescents.

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Md. Huzzatullah - Conceptualization, Investigation, Methodology, writing Original Draft, Writing -Review & Editing. Md. Shariful Islam - Investigation, Methodology, writing Original Draft, Writing -Review & Editing. Umme Habiba-Writing Original Draft, Writing -Review & Editing. All the authors read and approved the final version of this manuscript.

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Does this article screen for similarity?

Yes

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The ethical committee of Institute of Biological Sciences, University of Rajshahi, Bangladesh provided approval for the study (Memo no: 336(23)/320/IAMEBBC/IBSc). All participants gave consent to participate in the study.

Conflict of Interest

The authors have no conflicts of interest to declare. There is also no financial interest to report. The author certifies that the submission is original work and is not under review at any other publication.

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