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Original Article

The Correlation between Cognitive Emotion Regulation Strategies and Aggressive Behavior among Adolescents

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Abstract

Background: Aggressive behavior is a concerning issue among teenagers in Bangladesh and globally, requiring more focus on the identification of preventive and intervention techniques. The present study aimed to investigate the correlation between cognitive emotion regulation (CER) strategies and aggressive behavior among adolescents.

Methods: A cross-sectional correlational study design was employed to explore the correlation between CER strategies and aggressive behavior in 2023. The study included 300 adolescents (161 boys and 139 girls) randomly selected from five secondary schools in Rajshahi, Bangladesh. For data collection, the Bengali CER Questionnaire and the Measure of Aggressive Behavior were used. In order to analyze the data, descriptive statistics, correlation and multiple regression analysis were applied. All analyses were conducted using IBM SPSS version 25.

Results: The findings of the study showed that maladaptive strategies of CER were positively correlated to aggressive behavior (Self-blame: r=0.510, P=0.01; Rumination: r=0.506, P=0.01; Catastrophizing: r=0.474, P=0.01; Blaming others: r=0.384, P=0.01) while adaptive techniques of CER were negatively correlated to aggressive behavior among adolescents (Positive refocusing: r=-0.478, P=0.01; Refocus on planning: r=-0.331, P=0.01; Positive reappraisal: r=-0.470, P=0.01; Putting into perspective: r=-0.299, P=0.01). Maladaptive CER strategies (Self-blame: β=0.160, 95% CI [0.147, 1.295], P=0.014; Rumination: β=0.161, 95% CI [0.143, 1.293], P=0.015; Catastrophizing: β=0.157, 95% CI [0.194, 1.179], P=0.006; Blaming Others: β=0.110, 95% CI [0.022, 0.719], P=0.010) were associated with higher levels of aggressive behavior but adaptive strategies (Positive Refocusing: β=-0.189, 95% CI [–1.137, –0.225], P=0.004 and Positive Reappraisal: β=-0.135, 95% CI [–1.015, – 0.041], P=0.034) were linked to decrease in aggressive behavior.

Conclusion: It can be argued that adaptive CER methods serve as protective factors against aggressive behavior in adolescents while maladaptive CER strategies serve as risk factors.

Keywords: Emotion Regulation, Cognitive Emotion Regulation (CER) Strategies, Aggression, Aggressive Behavior, Adolescents

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1. Introduction

Aggressive behavior is a substantial public health and social issue that affects individuals and communities worldwide. Aggressive behavior is defined as acts that are meant to hurt or injure another individual (1). In developing countries like Bangladesh, the involvement of teenagers in aggressive and violent behavior are increasing day by day leading to very deadly consequences. The adolescents are wasting their prime time on violence, criminality, and aggression. Juvenile delinquency, fights, bullying, spoiling property of others, and disrupting the school environment are noticed among aggressive adolescents (2). Depression, perceived stress, low self-esteem, loneliness and poor life satisfaction, academic engagement and empathy, more offensive communication and family conflict, and lack of open communication with parents and family cohesion are all linked to aggressive behavior in adolescents (3). It has been shown frequently in developing countries that inadequate cognitive capacity to manage emotions may be connected with both the emergence and continuation of mental health issues, including depression, anxiety, and aggressive behavior, and so on. Insufficient capacity of regulating emotion has been found to be linked with the occurrence of mood and anxiety disorders (4) as well as impaired mental well-being (5, 6).

Aggressive behavior among adolescent is a growing concern in Bangladesh because sociocultural, academic, and environmental factors all have an impact on adolescent aggression. Studies in Bangladesh indicated a high gender and urban-

rural difference in adolescent aggression; a greater score is found in boys and among adolescents who are under greater academic pressure (7-9). Adolescent aggression is strongly predicted by poverty and low socioeconomic position in rural areas (10). An additional factor resulting in the escalation of aggressive behavior is a lack of coping mechanisms and insufficient access to mental health services.

Cognitive emotion regulation (CER) refers to the regulation of emotion in a conscious manner (11) by cognitive processes during or after experiencing a negative event (12). The most extensive model of CER strategies compiled by Garnefski and colleagues enumerates nine techniques used to manage emotions: catastrophizing, ruminating, refocusing on planning, positive reappraisal, accepting one's circumstances, putting things in perspective, positive refocusing, and self-blame (12). Maladaptive techniques of CER include Self-blame, Catastrophizing, Blaming others, and Rumination, and adaptive strategies include Acceptance, Refocusing on planning, Positive refocusing, Putting into perspective and Positive reprisal.

1.1. CER Strategies and Aggressive Behavior

A previous study showed that self-blame and placing blame on others can predict elements of anger and aggressive behaviors. Aggression and anger are also negatively predicted by positive refocusing (13). Anger and hostility are both highly connected to mostly maladaptive strategies of CER (14). Larionov and Grechukha found that the use of maladaptive CER explained aggression in adolescents (15). Research demonstrated that the use of unsuitable emotion regulation (ER) methods has a substantial impact on aggressive behavior among adolescents (16). Difficulties in identifying and interpreting emotions are also linked to maladaptive ER strategies, which can further lead to heightened aggression. Catastrophizing is one of these strategies that has been found to be a strong positive predictor of aggression (16).

Gutiérrez-Cobo and co-workers found that adaptive emotion regulation was linked to lower level of aggressive behavior among adolescents and adaptive emotion regulation can reduce aggressive behavior (16). Mohseni and colleagues discovered that cognitive emotion management techniques were able to mediate the correlation between angry rumination, early maladaptive schemas, and aggressiveness among adolescents (17). A study revealed that a substantial negative correlation between verbal and physical aggressiveness and cognitive emotional management techniques including positive reappraisal and refocusing on planning. Physical and verbal aggressiveness were positively linked to self-blame, blaming others, catastrophizing, and other disruptive techniques (18). Another research revealed that maladaptive CER strategies such as blaming others, self-blame, ruminating, catastrophizing and masculine sex role predicted aggressiveness directly, but healthy CER strategies and positive reappraisal predicted aggression indirectly (19). Navas-Casado and colleagues discovered that maladaptive techniques (like rumination) are correlated with aggressive behavior, whereas adaptive methods (like mindfulness) have the opposite effect (20).

Adolescents' mental health is a very crucial phenomena for a society. The development of aggressive behavior during adolescence can have severe and potentially permanent effects on one's life. If this major issue is denied, they will be less productive in their future lives. It is thought that aggressive behavior is connected to CER. This study will explore the CER techniques associated with aggressive behavior among adolescents. The exploration of individual risk and protective variables linked to the emergence and maintenance of emotional problems, and the dissemination of this knowledge for intervention and prevention purposes are the primary objective of this study.

The primary objective of this study was to examine the correlation between cognitive emotion regulation (CER) techniques and aggressive behavior among adolescents and also justify the CER strategies as predictors of aggressive behavior. It is expected that the results of this study help us find the connection between CER techniques and aggressive behavior among adolescents that will provide suitable clues to minimize aggressive behavior through psychological intervention considering CER techniques. The results of this study will help determine which CER strategies should be promoted in psychological interventions and which should be eliminated or replaced with more adaptive strategies in the daily lives of adolescents. The findings of this study will also provide knowledge that is crucial for mental

health professionals, sociologists, non-government organizations (NGOs), and policymakers to take effective steps to promote adolescent mental health conditions in Bangladesh.

2. Methods

2.1. Design

This study employed a cross-sectional correlational design to explore the correlation between CER techniques and aggressive behavior among adolescents.

2.2. Selection and Description of Participants

The target population of the present study were adolescent students of Rajshahi city, Bangladesh. The study participants were 300 adolescent students of class 9 and class 10 (9^{th} and 10^{th} grade), with ages ranging from 14 to 17 years. The mean age of the participants was 15.3 years. Students of class 9 and class 10 were taken as participants for the convenience of the present study. This study included 161 male and 139 female students.

2.3. Sample Size Determination

The adequacy of sample size was computed using the statistical power in correlational analysis. Cohen (21) defines a minimum of about 85 participants as having enough to identify a medium effect size (r=0.30) at 80% power at a 5% level of significance. The current study included 300 participants, which exceeds this minimum requirement (85 participants) and suggests adequate statistical power to detect meaningful associations among variables.

2.4. Data Collection and Measurements

2.4.1. The Bengali Adapted Version of Cognitive Emotion Regulation Questionnaire (CERQ)

The Bengali Adapted Version of CERQ was used for the present study to measure CER strategies. Garnefski and colleagues first developed CERQ (22). Ansary and Karim adapted CERQ in Bengali culture (23). It consists of 36 items. CERQ is a five-point Likert scale, with 1 denoting "almost never" and 5 denoting "almost always."

This scale is made up of nine subscales that are conceptually distinct from one another. Each subscale has four items. Subscales indicate distinct cognitive emotion regulation strategy. These subscales can be categorized as either adaptive or maladaptive CER mechanisms. Acceptance, positive reappraisal, positive refocusing, putting things into perspective, and refocus on planning are all examples of adaptive coping mechanisms; on the other hand, maladaptive (less adaptive) coping strategies include blaming others, ruminating, self-blame, and catastrophizing. Higher scores on a specific subscale indicate more use of the given strategy, and lower scores indicate the less use of the given strategy. Garnefski and colleagues discovered that the original CERQ subscales confirmed good internal consistencies (Cronbach's Alpha) of 0.68 to 0.83 and test-retest reliability of 0.48 to 0.65. CERQ has strong factorial, discriminative, and concept validity (22). Bangla CERQ split-half reliability was 0.78 using the Spearman-Brown method. The Bangla CERQ had high content validity, according to expert reports (23).

2.4.2. The Measure of Aggressive Behavior

The Measure of Aggressive Behavior was employed for the present study to measure aggressive behavior. Buss and Perry developed it initially (24), and Rahman adapted it for the Bengali speaking population (25). MAB includes 25 items. It is a five-point Likert scale with 5 denoting "totally true" and 1 denoting "totally false". The maximum attainable score can be 125, and the minimum attainable score can be 25. A score of 75 or higher was regarded as indicative of aggressive behavior (ABS). Higher scores on MAB indicate higher aggressive behavior. Similarly lower scores on MAB indicate lower aggressive behavior. The Bengali MAB was both reliable and valid in the context of Bangladesh.

2.4.3. Procedure

The present study was conducted at five secondary schools in Rajshahi, Bangladesh. Multistage random sampling strategy was used to select participants in order to collect relevant data. First, five secondary schools were randomly selected through lottery method from a complete list of schools in the city 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). Questionnaire was administered in classroom environment and a teacher was assigned by the authority of schools in each classroom to monitor the participants. They were then informed of the purpose and importance of the research in learning more about aggression and emotional control among adolescents in Bangladesh. Verbal consent was taken from the participants. Before administering the questionnaires, necessary rapport was established with participants. The participants were guaranteed the privacy of their answers, and they were not asked to sign their identities on the instruments used to collect data. The booklet was then distributed among the students. They were requested to go through the instructions provided on the top of the first page of each questionnaire. The completed booklets were collected from the participants and checked for any missing responses. If any items were left unanswered, the participant was politely requested to complete them. The students completed the questionnaires during school hours.

2.5. Data Analysis

Following the collection of raw data, responses were coded and scored before being entered into a computer data file. Statistical analysis such as Descriptive statistics, Pearson correlation, and Multiple Regression Analysis were applied to analyze the data. IBM SPSS version 25 was used in order to carry out each and every statistical analysis.

3. Results

The study participants were adolescent students between the ages of 14 and 17 years who were present at the time of data collection, able to comprehend the questionnaire items, and gave consent for participating in the study. The participants who had neurodevelopmental or any psychiatric problems, difficulty in understanding the questionnaire, and those who were taking medication and psychological treatment were excluded from the study.

The present study included 161 male and 139 female students (Table 1). Among the students, 150 respondents were the student of class 9, and 150 respondents were the student of class 10. Age distribution showed that there were 82 individuals aged 14, 112 aged 15, 92 aged 16, and 14 aged 17.

3.1. Correlation between CER Strategies and Aggressive Behavior among Adolescents

Pearson correlations between CER strategies and aggressive behavior among adolescents was performed on the total sample. The results of the correlation between CER strategies and aggressive behavior are presented in Table 2.

According to Table 2, Self-blame (r=0.510, P<0.001), Rumination (r=0.506, P<0.000), Catastrophizing (r=0.474, P<0.001) and Blaming others (r=0.384, P<0.001) had positive significant correlations with aggressive behavior. The positive correlation between maladaptive strategies of CER and aggressive behavior indicted that if maladaptive strategies increase, aggressive behavior tends to increase.

However, CER strategies which were adaptive namely Positive refocusing (r=-0.478, P<0.001), Refocus on planning (r=-0.331, P<0.001), Positive reappraisal (r=-0.470, P<0.001), and Putting into perspective (r=-0.299, P<0.001) had significant negative correlations with aggressive behavior. Aggressive behavior was not correlated with Acceptance strategy. The negative correlation

Table 1: Demographic characteristics of the participants

Sample Characteristics		Frequency	Percentage
Gender	Male	161	53.7
	Female	139	46.3
Academic Year (Class)	Class 9	150	50
	Class 10	150	50
Age (Years)	14	82	27.3
	15	112	37.3
	16	92	30.7
	17	14	4.7

Table 2: Pearson correlations between Cognitive Emotion Regulation strategies and aggressive behavior among adolescents

Variables	1	2	3	4	5	6	7	8	9	10
Self-Blame	1									
Acceptance	-0.004 (0.940)	1								
Rumination	0.647** <0.001	-0.031 (0.598)	1							
Positive Refocusing	-0.506** <0.001	0.006 (0.920)	-0.435** <0.001	1						
Refocus on Planning	-0.419** <0.001	0.039 (0.506)	-0.347** <0.001	0.595** <0.001	1					
Positive Reappraisal	-0.509** <0.001	-0.039 (0.502)	-0.488** <0.001	0..522** <0.001	0.537** <0.001	1				
Putting into Perspective	-0.356** <0.001	0.113 (.051)	-0.424** <0.001	0.479** <0.001	0.467** <0.001	0.490** <0.001	1			
Catastrophizing	0.500** <0.001	0.060 (.297)	0.538** <0.001	-0.414** <0.001	-0.330** <0.001	-0.466** <0.001	-0.288** <0.001	1		
Blaming Others	0.323** <0.001	0.069 (.234)	0.361** <0.001	-0.434** <0.001	-0.332** <0.001	-0.416** <0.001	-0.229** <0.001	0.322** <0.001	1	
Aggressive Behavior	0.510** <0.001	0.057 (323)	0.506** <0.001	-0.478** <0.001	-0.331** <0.001	-0.470** <0.001	-0.299** <0.001	0.474** <0.001	0.384** <0.001	1

Table 3: Multiple Regression Analysis in aggressive behavior

Predictors	Standardized Coefficient	t	Std. Error (SE)	P value	95% CI for β
	Beta(β)				
Self-Blame	0.160	2.473	0.292	0.014	[0.147, 1.295]
Rumination	0.161	2.459	0.292	0.015	[0.143, 1.293]
Positive Refocusing	-0.189	-2.938	0.232	0.004	[−1.137, −0.225]
Refocus on Planning	0.052	0.856	0.218	0.393	[−0.243,0 .616]
Positive Reappraisal	-0.135	-2.133	0.248	0.034	[−1.015, −0.041]
Putting into Perspective	0.029	0.505	0.230	0.614	[−0.336, 0.568]
Catastrophizing	0.157	2.743	0.250	0.006	[0.194, 1.179]
Blaming Others	0.110	2.091	0.177	0.037	[0.022, 0.719]

between adaptive strategies of CER and aggressive behavior indicted that if adaptive strategies increase, aggressive behavior tends to decrease.

3.2. Multiple Regression Analysis of CER Strategies Explaining Variance in Aggressive Behavior

Multiple linear Regression Analysis was performed on a total sample to determine the role of CER strategies on aggressive behavior among adolescents. Eight out of nine strategies were inserted into regression model. Acceptance was not inserted into regression model because Acceptance was not significantly correlated with aggressive behavior. Adding non-significant predictors could raise the possibility of multicollinearity or model overfitting while also decreasing the overall explanatory power of the model.

The findings of regression analysis between CER strategies and aggressive behavior are presented in Table 3.

According to Table 3, Maladaptive cognitive emotion regulation strategies such as Self -blame (β=0.160, 95%CI [0.147, 1.295], P=0.014), Rumination (β=0.161, 95%CI [0.143, 1.293], P=0.015), Catastrophizing (β=0.157, 95% CI [0.194, 1.179], P=0.006), and Blaming others (β=0.110, 95%CI [0.022, 0.719], P=0.037) were linked to the elevated levels of aggressive behavior among adolescents.

Standardized beta (β) of 0.160 for self-blame indicates that increasing one unit of self-blame will increase aggressive behavior by 0.160. Standardized beta (β) of 0.161 for Rumination indicates that increasing one unit of Rumination will increase aggressive behavior by 0.161. Standardized beta (β) of 0.157 for Catastrophizing indicates that

increasing one unit of Catastrophizing will increase aggressive behavior by 0.157. Standardized beta (β) of 0.110 for Blaming others indicates that increasing one unit of Blaming others will increase aggressive behavior by 0.110.

On the other hand, according to Table 3, Positive refocusing [β=-0.189, 95%CI [–1.137, – 0.225], P=0.004)], and Positive reappraisal [(β=-0.135, 95%CI [–1.015, – 0.041], P=0.034)] played a significant role in reducing aggressive behavior among adolescents. Positive refocusing and positive reappraisal had strong negative correlations with aggressive behavior. In particular, the positive refocusing (-0.189) and positive reappraisal (-0.135) showed that increased application of the two strategies relates to reduced levels of aggressive behavior. Aggressive behavior was not explained by the other two adaptive methods such as Refocus on planning and putting into perspective.

4. Discussion

The present study aimed to investigate the correlation between CER strategies and aggressive behavior in adolescents. The study was conducted on 300 adolescent students randomly selected from five schools in Rajshahi, Bangladesh. The Bangali Adapted Version of CERQ (23) was used to assess CER mechanisms, and Measure of Aggressive Behavior Scale (25) was used to measure aggressive behavior.

The findings of the present study showed that maladaptive strategies of CER, namely Self-blame, Catastrophizing, Blaming others and Rumination, were positively related to aggressive behavior among adolescents. However, adaptive mechanisms of CER such as Positive reappraisal, Positive refocusing, Refocusing on planning, and Putting into perspective were found to be negatively related to aggressive behavior. Aggressive behavior was not linked to Acceptance in this study. Despite being viewed as an adaptive ER technique, acceptance could not have a direct impact on aggressive behavior. The lack of a substantial link between acceptance and aggressive behavior in adolescents may be due to the fact that acceptance may be a reflection of passive coping or emotional disengagement rather than active regulation (22).

It is supposed that acceptance may be understood more as passive surrender or tolerance than as active emotional processing in the Bangladeshi cultural environment. Without addressing the emotional effects, adolescents may learn to "accept" challenging circumstances (such as family strife or academic pressure), which could result in internalization rather than a decrease in externalized behaviors like aggressiveness. Its ability to protect this population from aggressive behavior may be limited by this passive coping strategy.

These findings were consistent with previous research. For instance, Rauf and colleagues found that Physical and verbal aggressiveness were positively correlated with Self-blame, Blaming others, Catastrophizing (18). Navas-Casado and colleagues found that maladaptive emotion regulation techniques (like rumination) were correlated with aggressive behavior (20). Some other studies also showed that maladaptive strategies of CER have positive and adaptive strategies of CER have negative correlation with aggressive behavior (14, 15). Lower levels of Aggressive behavior were found with the people who can regulate emotion properly and healthily (16). Individuals with a high frequency of using adaptive coping methods like cognitive reappraisal are less likely to have negative affect and more likely to have positive affect. As negative affect is positively correlated with aggressive behavior, better emotional regulation decreases the likelihood of aggression (26).

Our study also aimed to justify the CER strategies as predictors of aggressive behavior among adolescents. The study results showed that maladaptive strategies of CER like Catastrophizing, Blaming others, Self-blaming, and Rumination were associated with higher levels of aggressive behavior among adolescents. However, adaptive mechanisms of CER such as Positive refocusing and Positive reappraisal were connected to lower levels of aggressiveness in adolescents. These findings were consistent with previous research (13, 15, 19).

Adolescents' use and perception of Emotion Regulation techniques may be influenced by cultural factors in Bangladesh, such as collectivist familial values, social conformity, and restricted emotional expression. For example, strategies like acceptance might be seen as passive surrender instead of active coping, which could account for the lack of a substantial correlation between them and violence.

Furthermore, adolescents may internalize stress as a result of the social stigma regarding mental health and the typicality of rigorous parental or academic discipline, which increases the prevalence and effectiveness of maladaptive behaviors like self-blame and rumination.

It is very crucial to consider that this study used a cross-sectional correlational design; thus, the findings indicated correlation rather than causal relationships between CER strategies and aggressive behavior. No causal inferences can be drawn from the findings of this study.

4.1. Limitations

The current research had a number of limitations which should be considered when interpreting the results. To begin with, a correlational design makes it impossible to make causal conclusions on the relationship between cognitive emotion regulation strategies and aggressive behavior. Second, the data is cross-sectional and does not permit studying how these relationships change over time or are stable. Third, the research used self-report measurement, which could be affected by social desirability and biases in responses. Lastly, the sample used was limited to school-going adolescents in particular grade levels which might not help generalize the results to non-formal adolescents in the education system or even to different stages of development.

5. Conclusions

The present study underscored the higher relationship between the cognitive emotion regulation (CER) strategies and aggressive behavior in adolescents. The results showed that maladaptive CER strategies, including catastrophizing, rumination and self-blame, have positive relationships with aggression and adaptive strategies, including positive reappraisal and positive refocusing, have negative relationships with aggressive behavior. These findings highlighted how emotion regulation processes are significant in explaining the attribution of adolescent aggression in the context of Bangladesh.

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Authors' Contribution

Md. Huzzatullah: Substantial contributions to the conception and design of the work, acquisition, analysis, and interpretation of data for the work; drafting the work and reviewing it critically for important intellectual content. Md. Shariful Islam: Substantial contributions to the conception and design of the work; acquisition, analysis, and interpretation of data for the work; drafting the work. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such as the questions related to the accuracy or integrity of any part of the work.

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Ethical Approval

The ethical committee of Institute of Biological Sciences, University of Rajshahi, Bangladesh approved the present research with the code of 336(23)/320/IAMEBBC/IBSc. Also, verbal consent was taken from the participants.

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