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RESEARCH ARTICLE

Effect of Emotional Regulation on Impulsivity and Anxiety Through the Mediating Role of Mindfulness

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ABSTRACT

Background: Adolescence is a phase blended with various challenges and changes. How someone takes these challenges and accepts the changes (physically, emotionally, or psychologically) are the major concerns of social scientists.

Objective: Keeping that objective in mind, current research has been done to assess if emotional regulation leads to impulsivity and anxiety through the moderating effect of mindfulness.

Method: For the purpose, correlational research design has been followed and randomly 150 young adolescent females were selected from various public as well as private schools following similar kinds of academic board (CBSE). Standardized tools pertaining to emotion regulation, impulsivity, anxiety, and mindfulness were administered. To accomplish the objectives of the study, apart from descriptive statistics correlation of coefficients was run followed by structural equation modeling (SEM) to highlight the mediating role of mindfulness between emotion regulation, impulsivity, and anxiety.

Conclusion: Major findings of the study revealed the direct effect of emotional suppression on anxiety and impulsivity through the moderating role of mindfulness whereas no such results were obtained for cognitive reappraisal. Hence, the proposed model has been partially found to be significant with the goodness of fitness index value of 0.935.

Keywords: adolescence, emotional regulation, impulsivity, anxiety, mindfulness, structural equation model.

INTRODUCTION

Individuals continuously exhibit several possible emotional cues in everyday life which varies from internal feelings such as an upset stomach to external events such as a band performing at a school fest. Since these kinds of inputs can occasionally cause full-fledged emotions, it can be assumed that people use some form of emotional regulation practically all of the time [1]. Emotions are frequently described as uncontrollable forces that have a significant impact on behavior. Individuals have a lot of control over their emotions and may cope with them in a variety of ways [2], along with the cognitive appraisal, which aids in molding an individual's emotional experience [3] and various physiological implications of [4].

Therefore, emotion regulation strategies encompass all of these processes, as well as others in which people attempt to manage or regulate their emotions [5]. In addition, people's emotional reactivity, such as the types of emotions they feel and the ways in which they express those feelings, varies. Emotion-eliciting stimuli or situations are regarded to be managed by antecedent-focused regulatory techniques, which are classified as such by Gross in 1998 [3]. As an antecedent-focused tactic, it is possible to describe cognitive reappraisal as an attempt to modify the meaning and effect of an emotional eliciting scenario [6]. It is the manner in which the meaning and emotional effect of a word or phrase are altered. The act of suppressing or reducing one's ability to communicate one's feelings has been conceptualized as "expressive suppression" [7].

Literature addressing negative emotions revealed that a response to actual or imagined risks that threaten or alter an individual's balance is considered as the state of anxiety [8]. Physiological and behavioral signs may be part of this reaction [9]. Anxiety's behavioral component includes acts such as halting one's current activity, increasing one's awareness of one's surroundings, and evading the source of danger [8]. This response is a protective mechanism that creates short-term concern or panic as a result of specific life events. Anxiety becomes pathological when it interferes with a person's capacity to function in daily life.

Moreover, anxiety disorders in adolescence are often accompanied by depression, which may last into adulthood in some people [10]. Adolescent anxiety may also arise as a result of people trying to fit in with society's expectations and conventions. Anxiety over not being accepted by individuals they find attractive is a common

stressor, as is a lack of self-confidence in social situations and a poor perception of one's own mental health. Other common stressors include depression and anxiety. Imprudent fears may occur later in adolescence due to the need of selecting a college or professional route or obtaining work [11]. Anxiety may be caused by a variety of variables, including those in the environment. Unpleasant life situations might cause anxiety in a kid or teenager [12].

Researchers have shown that anxiety disorders are more likely to develop and persist in those who have difficulty controlling their emotions [13]. In addition, research on non-clinical teenage populations shows that anxiety symptoms might be caused by emotional control impairments [14]. Students who had trouble regulating their emotions in college also reported having a lot of anxiety symptoms [15].

Research on the role of emotional intelligence in anxiety and depression among Adolescents found that self-reported ability to regulate mood (Emotional Repair) had a positive correlation with self-esteem, while self-reported emotional intelligence (Emotional Intelligence) had a negative correlation with depression and anxiety. Self-esteem and thought suppression were not shown to have a significant impact on emotional well-being, but emotional clarity and self-regulation of emotional states had a positive influence on psychological adjustment. Researchers found that teenagers who were able to differentiate between emotions and manage their emotional states exhibited reduced anxiety and despair, regardless of their self-esteem and thought suppression.

Goldin et al. (2010) [16] in another research concluded that fMRI when performed on 16 patients while they were responding to their own beliefs and managing unpleasant emotions using two forms of attention deployment: breath-focused attention and distraction-focused attention. When compared to the control group, the research found that those who did MBSR had reductions in anxiety and depressive symptoms, as well as an increase in their sense of self-worth. Participants reported reduced unpleasant mood, lower amygdala activity, and increased activity in brain areas associated with attentional deployment only during the breath-focused attention test. As a result, MBSR training may decrease emotional reactivity and improve emotional control in people with SAD. SAD-related avoidance, clinical symptoms, and automatic emotional response to negative self-beliefs in individuals with SAD may be reduced as a result of these changes.

Within the last decade, another psychological construct that gained popularity to address the cure for anxiety is mindfulness. In the present climate, not only this but has gained acceptance and expanded in importance in order to manage emotions and other areas of mental health. Self-regulation and self-awareness have been linked to greater well-being, and mindfulness has been shown to be an important component in developing this well-being, as well as enhancing the ability to act in line with one's own personal beliefs [17]. The amount of research being done on mindfulness has soared in recent years. Researchers have shown that mindfulness training has a powerful influence on anxiety and sadness [18]. Mindfulness and psychological suffering and well-being may be mediated by the capacity to manage unpleasant emotions, non-attachment, and rumination [19].

Mindfulness and emotional control were examined by Hill et al. (2012) in a research study. Emotional differentiation, emotional lability, and emotional challenges were also assessed. Positive and negative emotions were shown to have varying levels of emotional differentiation and lability, according to the study's findings. Emotional issues were shown to be less prevalent when people practiced mindfulness. Mindfulness and emotional lability seem to be linked via the mediation of emotional distinction. The link between mindfulness and both negative and positive emotion lability as well as positive emotion differentiation was mediated by emotion regulation as well. Mindfulness is associated with greater separation of one's distinct emotional experiences in a way that is consistent with good emotion control [20].

Additionally, this research focuses on impulsivity, which may be characterized as a propensity to act without thinking about the possible negative effects [21]. Attentional, motor, and non-planning impulsivity all fall under the Trait Impulsivity Model's three categories [22]. Improvisational impulses include attentional impulsiveness, motor impulsiveness, and non-planning impulses, which have been described as "a lack of future thinking or foresight" [23]. In

adolescents, impulsiveness has been linked to antisocial conduct and reactive anger [24]. Hostile and non-hostile teenagers seem to be differentiated by their impulsive motor activity [25]. The emotional momentum and inadequate planning drive impulsive teens, who lack emotional control and the inability to resist gratification.

Schreiber et al. in 2012 conducted research on young adults examined the emotional dysregulation of 194 participants by categorizing them into low, average, and high categories. There were substantial differences in impulsivity, harm avoidance, and cognitive reasoning among the people who reported having difficulty controlling their emotions. Neither impulsive behavior nor cognitive impulsivity differed significantly across the groups [26]. Franco et al. in 2016, among adolescents with behavioral problems in the classroom, revealed that there was a statistically significant decrease in the levels of impulsivity and aggressiveness in both the experimental and control groups. This indicates that mindfulness training is effective at decreasing impulsive and aggressive behaviors in the classroom. As a result, stressing the effectiveness of mindfulness-based training is essential [27].

Aim: To investigate the effect of emotional regulation on impulsivity and anxiety levels through the moderating role of mindfulness with the help of a path model among female adolescents.

Research Objective:

- The primary object of the current empirical investigation is to study the level of emotion regulation (Cognitive Reappraisal & Expressive Suppression), impulsivity, anxiety, and mindfulness.
- The second objective is to establish the correlation among emotion regulation, (Cognitive Reappraisal & Expressive Suppression) impulsivity, anxiety, and mindfulness.
- The fifth objective is to test the proposed path model.

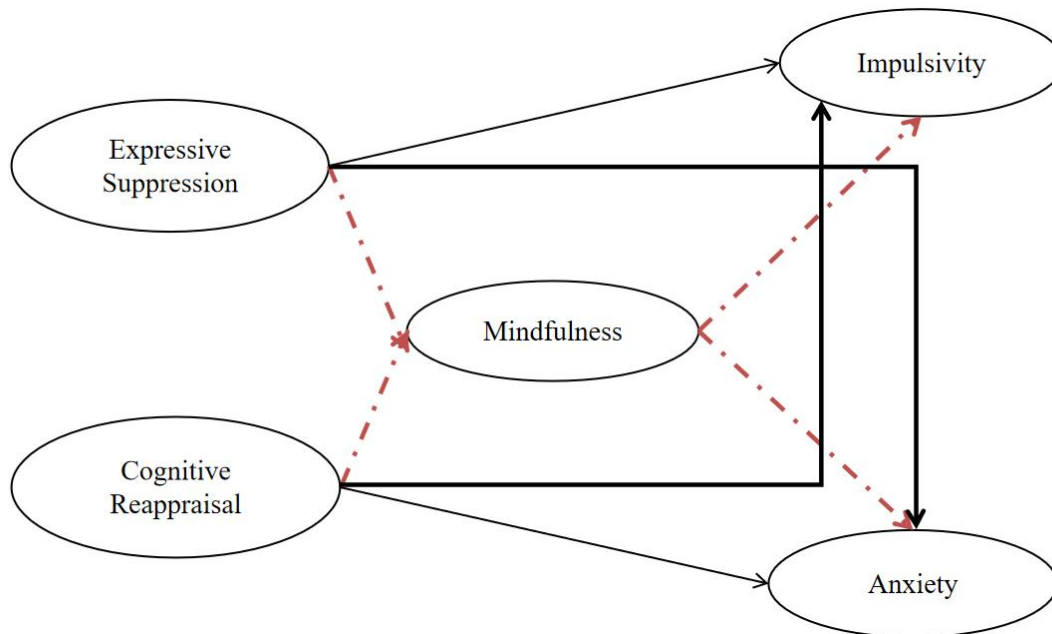


Figure 1: Proposed Model for testing.

Hypotheses:

- There would be a positive association among emotion regulation (Cognitive Reappraisal & Expressive Suppression), anxiety, and impulsivity.
- Mindfulness would be negatively associated with emotion regulation (Cognitive Reappraisal & Expressive Suppression), anxiety, and impulsivity.
- There would be a direct effect of emotion regulation (Cognitive Reappraisal & Expressive Suppression) on the anxiety and impulsivity levels of adolescents.
- There would be an indirect effect of a mindfulness intervention on the emotion regulation (Cognitive Reappraisal & Expressive Suppression), impulsivity, and anxiety levels of adolescents.

METHOD

Research Design:

To accomplish the objectives of the current empirical research investigation the ex-post facto research design was adopted under which correlation research design was followed. Ex-post facto research design was primarily adopted for non-experimental research where the investigator aims to establish correlation among certain identified variables for a specific sample and does not have scope to get first-hand data before or after the occurrence of any specific event. In a correlational study, researchers are interested to explore the strength, direction, and significance of the relationship among the variables.

Participants:

The sample consisted of adolescent girls (N = 150) from ten public and private schools in the urban city of Patiala and Ambala. The participants were in the age range of 13-15 years and were school-going and living with their parents. For the sampling incidental method was followed.

Demographics

| Demographic Factors | | % |
|----------------------|--------------|-------|
| School | Public | 56.00 |
| | Private | 44.00 |
| Class | 9th | 52.00 |
| | 10th | 48.00 |
| Age | 13-14 years | 43.00 |
| | 14-15 years | 57.00 |
| Number of Siblings | Single Child | 7.00 |
| | 2 | 69.00 |
| | 3 | 18.00 |
| | 4 | 6.00 |
| Birth order Position | 1 | 46.00 |
| | 2 | 38.00 |
| | 3 | 11.00 |
| Type of Family | 4 | 5.00 |
| | Nuclear | 71.00 |
| | Joint | 29.00 |
| Area of Living | Rural | 68.00 |
| | Urban | 32.00 |

Measures:

- 1. Emotional Regulation Questionnaire [ERQ; Gross & John, (2003)]:** Respondents' inclination to manage their emotions in two ways: (1) Cognitive Reappraisal and (2) Expressive Suppression was assessed using a ten-item questionnaire. Respondents rate each item on a 7-point Likert-type scale, with 1 (strongly disagree) and 7 (strongly agree).
- 2. Freiburg Mindfulness Inventory:** A 14-item assessment of mindfulness that covers all areas. The goal of this assessment is to provide a comprehensive picture of the subject's mindfulness practice. The scale's moderate to high associations with self-awareness and self-knowledge measures supported its validity. The scale's internal consistency (sample 1 $\alpha = 0.83$ and sample 2 $\alpha = 0.85$) was excellent. An excellent to high internal consistency was found in the two-factor model (presence $\alpha = 0.82$; acceptance $\alpha = 0.74$). Acceptable construct validity was found.
- 3. Baratt Impulsiveness Scale, Version II [BIS-VII; Patton, Stanford & Baratt, (1995)]:** The BIS-11 is a 30-item self-report questionnaire that is scored on a 4-point Likert scale and is used to examine the multidimensional character of impulsive behavior. A total of three subscales are included: 1) motor impulsivity (10 items), 2) cognitive/attentional impulsivity (8 items), and 3) non-planning impulsivity (12 items).

- 4. State and Trait Anxiety Inventory [STAI; Spielberger, (1977)]:** In this self-report assessment scale of 40 items, there are independent measures of state anxiety and trait anxiety. The scale is split into five dimensions: tension, guilt-proneness, maturity, suspiciousness, and self-control. The tension dimension is the most severe.

Data Analysis:

The objectives of the study have been accomplished by adopting the ex post facto (correlational) research design. Hence, descriptive statistics have been run followed by Person's correlation of coefficient. Further, to test the proposed model, path analysis was applied. To run all the statistical analyses, SPSS (ver. 23) was used.

Results

The current empirical research has been planned with the primary object of the current empirical investigation is to study the level of emotional regulation, impulsivity, anxiety, and mindfulness and to establish the correlation among these variables. Additionally, the third objective is to explore the direct effect of emotional regulation on impulsivity, and anxiety and explore the indirect effect of emotional regulation on impulsivity, and anxiety through the mediating role of mindfulness. And finally, the objective was to test the proposed path model.

For this purpose, correlational research design has been followed and randomly 150 young adolescent females were selected from various public as well as private schools following similar kinds of academic board (CBSE). Standardized tools pertaining to emotion regulation, impulsivity, anxiety, and mindfulness

were administered. To accomplish the objectives of the study, apart from descriptive statistics and correlation of coefficients (Table 2) were run followed by structural equation modeling (SEM) to highlight the mediating role (Table 3) of mindfulness between emotion regulation, impulsivity, and anxiety.

Table 2: Summary for descriptive statistics and bi-variate correlation of coefficient matrix

| | | Mean | S.D. | 1 | 2 | 3 | 4 | 5 |
|-------|---|-------|-------|---------|---------|---------|---------|------|
| ES | 1 | 20.28 | 6.53 | 1.00 | | | | |
| CR | 2 | 16.94 | 6.04 | 0.36** | 1.00 | | | |
| Anx. | 3 | 68.58 | 22.67 | 0.69** | 0.33** | 1.00 | | |
| MF | 4 | 64.37 | 31.19 | -0.77** | -0.31** | -0.87** | 1.00 | |
| Impl. | 5 | 46.04 | 14.93 | 0.73** | 0.32** | 0.80** | -0.86** | 1.00 |

NOTE: CR = Cognitive Reappraisal; ES = Expressive Suppression; Anx. = Anxiety; MF = Mindfulness; Impl. = impulsivity.
Correlation is significant at the * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (1-tailed).

Table 3: Standard Regression Estimates, S.E., C.R., & P Values.

| Endogenous Variables | Paths | Exogenous Variables | Standard regression estimates | S.E. | C.R. | P |
|----------------------|-------|---------------------|-------------------------------|------|--------|--------------|
| MF | ← | ES | -0.76*** | 0.24 | -14.50 | 0.001 |
| MF | ← | CR | - 0.04 | 0.26 | -0.79 | 0.42 |
| Anx. | ← | ES | 0.01 | 0.21 | 0.26 | 0.79 |
| Impl. | ← | MF | -0.72*** | 0.03 | -11.08 | 0.001 |
| Anx. | ← | MF | -0.85*** | 0.04 | -13.56 | 0.001 |
| Impl. | ← | ES | 0.16* | 0.14 | 2.38 | 0.02 |
| Anx. | ← | CR | 0.05 | 0.14 | 1.38 | 0.16 |
| Impl. | ← | CR | 0.04 | 0.10 | 1.02 | 0.30 |

NOTE: CR = Cognitive Reappraisal; ES = Expressive Suppression; Anx. = Anxiety; MF = Mindfulness; Impl. = impulsivity.
Correlation is significant at the * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (1-tailed).

The above table shows the significant paths between the exogenous and endogenous variables being treated in the proposed model through the obtained standardized regression weights and critical ratio with respective significance at the p level. Mindfulness emerged as an endogenous variable to the exogenous variable expressive

suppression ($\beta = -0.76$) with a critical ratio of -14.50 which is highly significant at 0.01 level of significance. Similarly, Impulsivity has emerged as an endogenous variable to expressive suppression ($\beta = .15$) with a critical ratio of 2.38 which is highly significant at a 0.02 level of significance.

Table 4: Summary of Goodness of Fit Indices

| Model | GFI (Goodness of Fit Index) |
|--------------------|-----------------------------|
| Default Model | 0.93 |
| Saturated Model | 1.00 |
| Independence Model | 0.37 |

The above table shows the fit indices measures of the proposed model. The goodness-of-fit index is 0.93, thus confirming the good fit of the model.

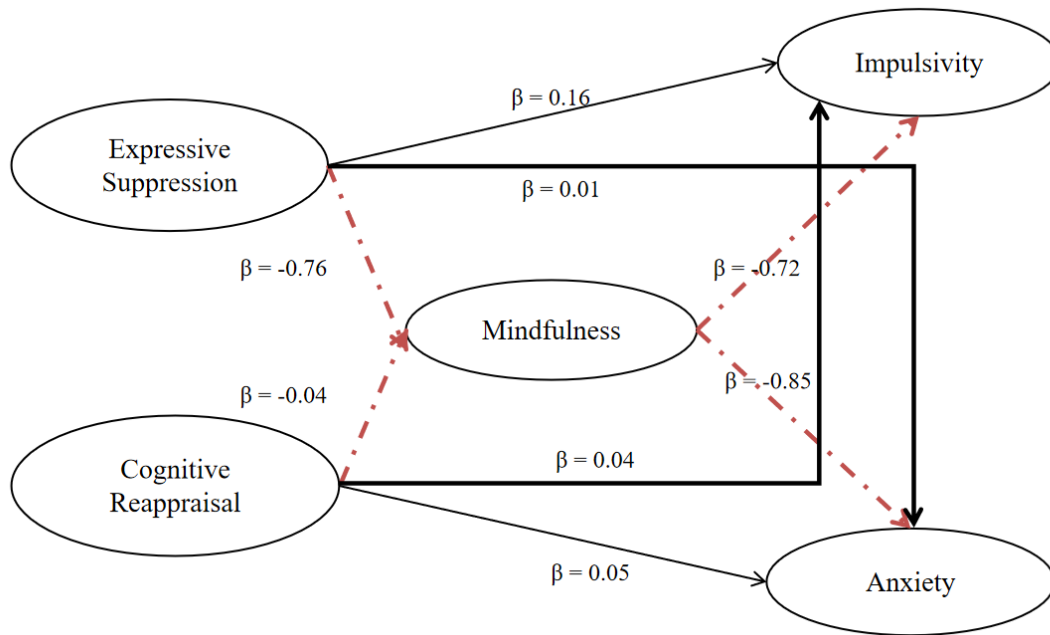


Figure 2: Outcome of Structure Equation Modelling with Significant and Non-Significant Paths

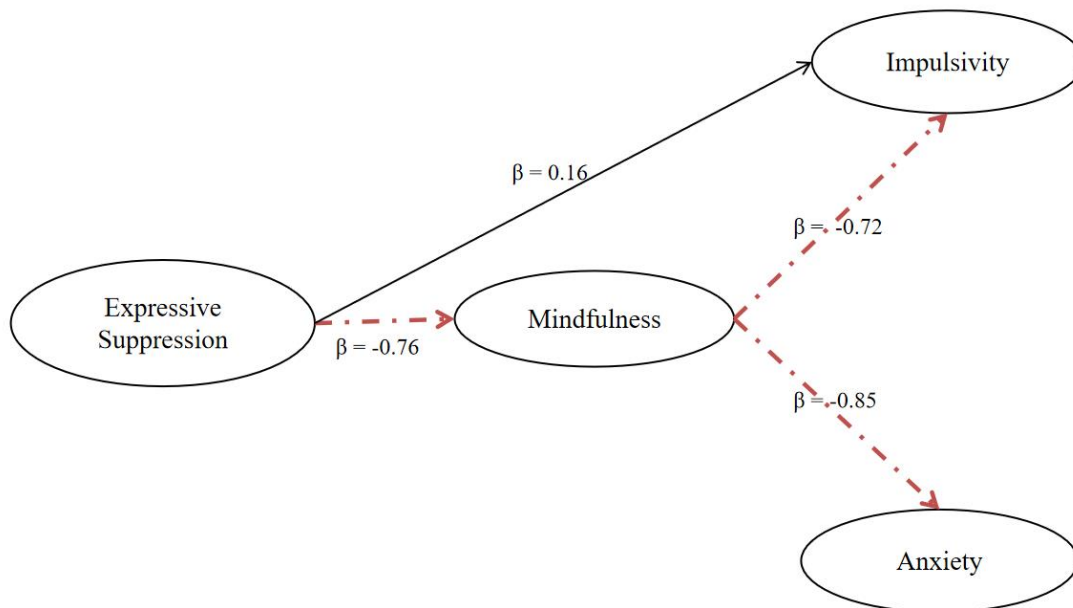


Figure 3: Outcome of Structure Equation Modeling with Significant Paths

The table also shows that mindfulness also acts as an exogenous variable towards impulsivity ($\beta = -0.72$) and anxiety ($\beta = -0.85$) with a critical ratio of -11.08 and -13.56 respectively significant at 0.01 level of significance (see Figure 2 and 3). On the other hand, it was noticed that endogenous and exogenous relations remained non-significant

among mindfulness to Cognitive reappraisal, anxiety to emotional suppression and cognitive reappraisal, and impulsivity to cognitive reappraisal.

DISCUSSION

Adolescence is a phase of life that has been considered a period of “storm and stress”

wherein children experience an increased amount of conflict, emotional disturbances, and decision-making. Though this conceptualization of adolescent experience might not be universal to all some evidence suggest that adolescents experience an increased amount of emotional intensity and interpersonal conflict as compared to little children or adults [28]. Experiencing emotions is a basic phenomenon that involves a wide range of processes that are connected to an individual's immediate environment and further helps in assessing his decision-making towards the attainment of his short or long-term goals which plays a vital role in the process of experiencing emotions.

The present study aims to investigate the effect of emotional regulation (cognitive reappraisal and expressive suppression) on impulsivity and anxiety levels of female adolescents through the moderating role of mindfulness. The study indicated that there was no significant effect of cognitive reappraisal on the anxiety or impulsivity levels of adolescents. However, it was noticed that expressive suppression has significant and negative relation with mindfulness levels of adolescents which indicates that the more emotional experiences are suppressed by adolescents the less likely they are open to accepting their emotions and being mindful about what they feel. Gross (2014) suggested that mindfulness helps in the development of an unbiased, openness to experience, curious, and accepting attitude which enhances an individual's emotional experiences that further help in reducing the likelihood of emotional suppression. With a better level of mindfulness adolescents may be able to reduce the expressive suppression of their emotional experiences [29].

It was also noticed that expressive suppression is directly linked to the impulsivity levels of female adolescents which indicated that when females suppress what they feel and do not exhibit their emotions, they tend to exhibit more impulsive or aggressive behaviors over the period of time. One of the reasons behind these findings could be the environmental and cultural factors of being in Indian society, as females from a very young age are taught that the best way to handle their emotional experiences is by not speaking about it or being silent about their experiences which might further lead to more disruptive behavior in late life as their abilities to understand their own emotions are being hampered at a young age. Conway (2005) conducted a study that stated that promoting emotional suppression in

young females can lead to difficulties in the development of specific emotional regulation approaches and behavioral competencies. Suppression of emotions such as anger can lead to limiting their development and understanding of different strategies that can be used to regulate and express a variety of emotions [30].

Taking into consideration the context of females in Indian society, it can be inferred that females have very less opportunities to express what they feel and hence, expressive suppression is one factor of emotional regulation that triggers the other problems that are faced by the individuals. Though in the current study, emotional regulation does not affect the anxiety levels of adolescent girls directly, it was noticed that mindfulness plays a moderating role and is negatively related to the anxiety levels of adolescent girls. Lower levels of mindfulness lead to individuals involved with overthinking and experiencing negative feelings and thoughts which might further increase their anxiety levels.

Research conducted by Hambour et al., in 2018 [31] proposed that adolescents experience high anxiety levels when they are unable to regulate emotions strategically. Their study also investigated that sub-scales of mindfulness were highly associated with symptoms of social anxiety in adolescents. Another aspect that was investigated in the current study was that mindfulness is also related to the impulsivity levels of girl adolescents. Individuals exhibit high levels of impulsivity when they are not mindful of their feelings and behaviors. It can be inferred from the results that mindfulness does play a moderating role in the relationship between expressive suppression and impulsivity as adolescents who are not able to express their emotions or suppress them might exhibit impulsive behaviors and low mindfulness levels would also lead to the same. The findings of the study are consistent with previous research conducted by Peter et al., (2011) inferring the negative relationship between mindfulness and impulsivity [32].

From Indian sociocultural perspective females irrespective of their age, education and professional growth, they prefer expressive suppression as their preferred emotion regulation strategy. Reason being they are not given space to express and has no learning how to cognitively reappraise their emotions. Females at adolescent age are more venerable group because they do not get support from their mothers and other adult female relatives in the family. Which makes them to be judgemental about their situations, emotions and learning. Additionally, they also find it

difficult to pay attention to their current state and mostly under the influence of consequences from their past experiences. Therefore, expressive suppression overpowers the ability of someone to be mindful which further responsible to trigger sense on anxiety and impulsive behaviour. It also indicates that in many social groups mindfulness has not been a part of day-to-day practice, hence can only considered as state aspect not the trait.

Mindfulness can play key role in the process to experience positive behavioral aspects or can be an outcome of other behavioral processes [33]. This idea has empirically been proven among under-graduate students where emotion regulation predicted mindfulness along with psychological well-being and solo contributed towards the prediction of mindfulness is 7% [34]. The present investigation adds on the idea claimed by Shapiro and Carlson (2009) that mindfulness can be treated as process but contributes not only towards the positive behavioral aspects rather helps to understand negative aspects such as anxiety and impulsivity.

The present findings provides microscopic analysis from collective cultural society indicating that adolescent girls with poor mindfulness report more anxiety and impulsive behaviour. Furthermore, adolescent females do not get scope to use or not even have score to learn cognitive reappraisal as emotion regulation strategy. They by default use expressive suppression which they easily learn from the other female counterparts or adult females of the family and social groups. They from very young age are trained to listen and follow the instructions given by the male members of the family, provide support to other family members in the family and engage in domestic chores. Whereas, male adolescents are given free will to express their emotions freely but mindfulness still is not the part of the socialization process for either gender. In other words, people utilizes emotion regulation effectively would be more mindful i.e.. would be non-judgemental and pay attention to the current event. Regular practice of mindfulness makes an individual less venerable to anxiety and impulsive behavior.

To conclude, transitioning from infancy to adulthood is commonly marked by emotional turmoil throughout adolescence. Adolescence is a time when anxiety and sadness are more common, further emphasizing the necessity of learning about the molecular underpinnings of behavior and emotion control during this era. Adolescents have a higher risk of negative consequences because of brain changes and individual anxiety predispositions. Peer pressure as well as social

expectations to conform to ideal conduct throughout adolescence may lead to emotional outbursts in adolescents, depending on their own threshold for expressing their feeling [35]. We can infer from this finding that adolescents may have difficulty controlling their behavior in emotional contexts because of a conflict between increased activity in subcortical emotional processing systems and immature top-down prefrontal systems, which is in line with the findings of the current study. The emotional sensitivity of certain teenagers may put them in higher danger during this delicate developmental shift.

Limitations of the study

- The sample of the study was limited to female adolescents and self-report measures were used for mindfulness intervention.
- The sample of the study was also limited to the geographical area of Ambala and Patiala.

Implications of the study

The current study focuses on establishing a relationship between emotional regulation, anxiety, and impulsivity through the mediating role of mindfulness. The results of this research shed light on the fact that women in India have a hard time expressing their feelings and, as a result, are very repressive about doing so. This may lead to anxiety and, in some cases, impulsive conduct. Findings can be interpreted as an indication of the mental health of female adolescents in India, as the sample is female, and the results indicate that female adolescents are self-silent or emotionally suppressed, which is consistent with the patriarchal customs that are still practiced in most Indian regions.

This research may assist provide a robust statistically examined count of teenagers who are in need of advice and support, in order to preserve their emotional stability while they through a variety of physical, emotional, and environmental changes. Since it is important to understand how teenagers can be made aware of their emotions, and how they may acquire insight into consciously controlling their emotions, this research can assist in lowering anxiety levels and improving quality of life.

The findings of this study may be used to make changes to the curriculum for vulnerable students/children, taking into account their mental health. Mindfulness-based exercises and lectures should be included in school curricula to assist

students in better managing their emotions and becoming more emotionally literate.

Future consideration

In the present research, the participants were exclusively teenage females, which was a limitation. The findings of this study will allow future researchers to investigate the identical setting in men and draw conclusions about how the two genders differ. Further exploration of the

geographic distribution of the studied variables is possible in future research studies. Future studies may also investigate the context of female self-silence in relation to emotions and impulsivity, as well as the relationship between the two. Adolescents may benefit from mindfulness-based programs that help them comprehend and have more clarity about their emotions and related challenges.

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