A DEVELOPMENT OF MINDFULNESS-BASED INTERVENTIONS FOR PROMOTING STUDENTS' EMOTIONAL REGULATION

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ABSTRACT

This study aims to examine the definition and components of emotional regulation among middle school students, to develop mindfulness-based interventions for promoting emotional regulation and also to evaluate the effectiveness of the mindfulness-based interventions for promoting emotional regulation. The sample consisted of seventh- and eighth-grade students from Guanling Ethnic Middle School in Guizhou Province. Research tools included semi-structured interview questionnaires, an emotional regulation questionnaire, and a mindfulness-based intervention designed to promote students' emotional regulation. Statistical methods such as mean, standard deviation (SD), and one-way and two-way repeated measures ANOVA were used for data analysis. Based on the principle of voluntary participation, 60 students were randomly assigned to an experimental group (n = 30) and a control group (n = 30). The experimental group received the mindfulness-based interventions, while the control group did not. The findings revealed that emotional regulation among students consists of four components: awareness and understanding of emotions acceptance of emotions, the ability to engage in goal directed behavior and access to emotional regulation strategies. The mindfulness-based intervention for promoting students' emotional regulation consisted of three steps: introduction, learning activities, and conclusion. Additionally, the intervention comprised 14 sessions, each lasting 90 minutes. The mindfulness-based intervention was effective in promoting students' emotional regulation, and the experimental group continued to show improvement at a one-month follow-up. Specifically: 3.1) Students' emotional regulation after receiving the mindfulness-based intervention and after the follow-up period was significantly higher than before the intervention, at a significance level of .05 and 3.2) Students' emotional regulation after receiving the intervention and after the follow-up period was significantly higher than those in the control group at a significance level of .05.

Keywords: Emotional Regulation, Mindfulness-Based Interventions, Middle School Students

1.0 INTRODUCTION

With the ongoing deepening of educational reform in China, the issue of students' mental health has received increasing attention from all sectors of society. In recent years, the government has introduced a series of policy documents emphasizing the central role of mental health education within the primary and middle school systems (Chen & Yang, 2024). Thus, the government has revised the Guidelines for Mental Health Education in Primary and Secondary Schools explicitly called for a systematic approach to mental health education to comprehensively enhance students' psychological well-being (Liu et al., 2023). Similarly, the 14th Five-Year Plan for National Education Development identified mental health education as a crucial component of quality education, highlighting the need to strengthen students' emotional regulation and psychological adjustment abilities to support their holistic development (Ministry of Education of the People's Republic of China, 2022). Against this policy backdrop, emotional regulation has come to be widely regarded as one of the core indicators of mental health, directly influencing students' academic performance, quality of interpersonal relationships, and ability to cope with life stress (Liu et al., 2019).

Middle school students are in a critical period of rapid physiological and psychological change, characterized by intense emotional fluctuations and a notable rise in negative emotions such as anxiety, depression, and anger (Chen et al., 2011). However, current research and educational practice suggest that many middle school students still face significant challenges in emotional regulation, often exhibiting intense emotional reactions, impulsive expression, or excessive suppression of emotions (Yin, 2019). Although the cultivation of emotional regulation abilities in middle school students has gradually attracted attention in the field of education, there is still a significant research gap in terms of effective educational models for enhancing this ability. In particular, empirical studies on the application of mindfulness-based interventions in emotional regulation among middle school students remain scarce.

Emotional regulation plays a crucial role in the personal development of middle school students, as it not only directly impacts their mental health but also significantly influences academic performance, the quality of interpersonal relationships, and social adaptability (Morris et al., 2017). The development of emotional regulation is especially critical during the developmental stage of youth, a period marked by increasingly complex emotional experiences and rising social pressures (Zimmermann & Iwanski, 2014). Therefore, a deep understanding of the concept of emotional regulation is a vital prerequisite for implementing effective educational interventions and promoting the holistic development of middle school students. With the development of various emotion regulation strategies, mindfulness has gradually emerged as a regulatory approach that integrates cognition and experience. By enhancing individuals' awareness of their present emotional states and fostering non-judgmental acceptance, mindfulness helps reduce the automaticity of emotional responses and improves regulatory effectiveness (Gross & Muñoz, 1995).

The objectives of this study are to examine the definition and components of emotional regulation among middle school students, to design mindfulness-based interventions aimed at promoting their emotional regulation, and to evaluate the effectiveness of these interventions in enhancing students' emotional regulation abilities. The study contributes to knowledge by offering a deeper understanding of emotional regulation in middle school students, highlighting the practical value and implementation potential of mindfulness-based approaches in fostering emotional regulation, and providing useful insights for teachers to apply mindfulness-based intervention models in developing strategies that improve students' emotional regulation, facilitate smoother teaching, and enhance learning efficiency.

2.0 LITERATURE REVIEW

2.1 Emotional Regulation

Emotional regulation has been defined in various ways, however agreed definition among the scholarly stated that dynamic developmental process through which individuals use internal and external resources to manage their emotions for adaptive outcomes (Thompson, 1994; Gross & Thompson, 2007). It is not static but evolves with maturation and environmental influences, shaping students' self-control and social competence (Gratz & Roemer, 2004; Aldao & Plate, 2018). Emotional regulation involves both downregulating negative emotions such as anger and fear, and upregulating or sustaining positive emotions such as joy and pride, with strong links to academic achievement, peer relationships, and psychological well-being (Argyriadis et al., 2024). It is viewed not as opposing emotion, but as an integral part of emotional functioning, especially in academic contexts where managing anxiety, frustration, and excitement supports learning motivation, self-efficacy, and performance (Argyriadis et al., 2024). As a critical component of the individual's psychological regulation system, students' emotional regulation is grounded in several major psychological theories. Current academic research primarily constructs its theoretical foundation from three dimensions: the process mechanisms of emotional regulation, developmental characteristics, and social influences. These perspectives together form a relatively systematic explanatory framework.

2.2 Emotional Regulation Processing Model and Theories

According to Gross (1995), one of the most impactful theoretical frameworks in understanding emotional regulation is the Process Model, which emphasizes the different stages and strategies involved in regulating emotions. This model divides the regulation of emotion into two main phases: the stage oriented toward antecedent factors, which may involve strategies such as selecting or altering situations and directing attention, and the stage centered on responses, which can include techniques like cognitive reappraisal and the suppression of emotional expression Emotional regulation, in this view, is a conscious and strategic process (Gross, 1998).

The model emphasizes the sequential nature and strategic variability of regulatory behaviors, making it particularly effective in explaining how students respond emotionally in varying situations such as academic pressure, peer conflict, or teacher-student interactions (Gross, 1998). Moreover, the process model has served as a theoretical basis for the development of numerous assessment tools and intervention programs related to emotional regulation.

The Emotion Socialization Theory developed by Eisenberg et al. (2005) underscores the crucial roles of family,

school, and cultural contexts in shaping students' emotional regulation abilities. This theory posits that children and adolescents acquire emotion regulation skills primarily through social interaction mechanisms such as observation, imitation, feedback, and emotion coaching. The ways in which parents and teachers express and regulate their own emotions directly influence student' emotional regulation behaviors.

Zimmermann & Iwanski (2014) proposed the theory of self-regulated learning, emphasizing that emotion regulation, as part of the self-regulation process, influences students' learning behaviors and academic achievement.

According to Zimmerman's framework, students' emotional regulation abilities are closely related to their goal setting, monitoring, and self-evaluation. In the process of self-regulated learning, emotion regulation helps students manage learning-related emotions such as academic anxiety and disappointment, and this capacity has a significant impact on students' motivation and academic performance.

Pekrun & Stephens (2009) introduced the Control-Value Theory, a theoretical framework specifically targeting emotional regulation in academic contexts. Study argued that students' emotional responses during learning are determined by their perceived control over tasks and the value they attribute to them. Specifically, students' emotional regulation abilities are influenced by their appraisal of control over learning tasks (e.g., self-efficacy) as well as their affective evaluation of the tasks (e.g., interest or perceived importance). This theory highlights the contextual adaptability of emotional regulation processes, meaning that students adjust their emotional responses according to the difficulty of academic tasks and their goal orientations. In summary, the theoretical foundation of students' emotional regulation is primarily constructed from the process-oriented perspective, developmental psychology, and socio-environmental influences. Together, these three theoretical dimensions mechanism, developmental stage, and social context offer an in-depth account of the composition and developmental trajectory of students' emotion regulation capacities, thereby establishing a robust theoretical basis for the design of targeted interventions and the implementation of empirical research.

2.3 Promoting Mental Health and Emotional Adaptation among Students

Effective emotional regulation is widely acknowledged as a crucial protective factor for maintaining mental well-being. Learners who adaptively employ strategies such as cognitive reappraisal and acceptance of emotions generally exhibit markedly reduced symptoms of depression, anxiety, and stress (Aldao et al., 2010). In contrast, deficits in emotion regulation are strongly linked to the development of emotional disorders (Gratz & Roemer, 2004). Robazza & Ruiz, (2018) highlighted that regulating emotions involves more than the suppression of negative affect; it centers on fostering emotional equilibrium and adaptively managing emotional experiences, both of which are vital to adolescents' psychological health.

In educational contexts, students' emotional states directly influence their attention, working memory, and executive functions (Pekrun & Stephens, 2009). Students with strong emotional regulation abilities can maintain higher levels of learning motivation and cognitive engagement when facing academic pressure and test anxiety, thereby achieving better academic outcomes.

The capacity to regulate emotions is essential for the healthy social functioning of adolescents. An effective emotional regulation contributes to the establishment of positive interpersonal relationships, enhances perceived social support, and fosters a sense of group belonging. In contrast, insufficient emotional regulation abilities are often linked to impulsive behaviors, emotional outbursts, and interpersonal conflicts (Eisenberg et al., 2005). Emotional regulation patterns established during adolescence are relatively stable and have profound impacts on individuals' ability to cope with stress, regulate emotions, and develop healthy personality traits in adulthood (Cutuli, 2014). Consequently, fostering students' emotional regulation abilities has been regarded as a critical intervention target for preventing mental health disorders and promoting positive developmental outcomes.

Students' ability to regulate emotions directly influences their emotional responses to learning tasks, thereby affecting learning motivation, classroom performance, and academic achievement (Querstret et al., 2020). In particular, students who are able to regulate their emotions effectively under academic pressure tend to maintain higher levels of learning engagement and stronger academic self-confidence. As a vital component of psychological functioning, emotional regulation plays a foundational and pivotal role in personality development, mental health, academic adjustment, and social functioning. Studies have shown that individuals with strong emotion regulation skills are better equipped to adapt to complex and changing external environments, improve cognitive processing efficiency, enhance the quality of social interactions, and, to some extent, prevent the onset of various psychological disorders Overall, the significance of students' emotional regulation lies not only in its immediate role in supporting learning and emotional adaptation, but also in its long-term effects on personality development, psychological health, and social functioning. Based on the aforementioned theoretical and empirical findings, emotional regulation has become a central focus in educational interventions, psychological counseling, and school-based mental health services, highlighting its increasing research and practical value.

2.4 Strategies to Enhance Students' Emotional Regulation

Given the extensive and long-term influence of emotional regulation on students' mental health, academic performance, and social adaptation (Eisenberg et al., 2005), enhancing students' emotional regulation has become

a critical focus in educational psychology and school-based intervention research. Contemporary studies and practices suggest that strategies for strengthening students' emotional regulation can be approached from five dimensions: cognitive training, social support, curriculum integration, skill instruction, and environmental optimization.

Emotional regulation is a learnable skill that can be enhanced through planned interventions and by training students to reinterpret the meaning of stressful events has been shown to alleviate anxiety and anger (Keng et al., 2011). In addition, strategies related to expressive regulation, such as appropriate expression of positive emotions and control over nonverbal cues, have been found to improve social satisfaction and self-esteem. Social and Emotional Learning (SEL) provides a systematic, curriculum-based framework for fostering students' abilities to regulate emotions. This approach is grounded in five central competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Collaborative for Academic, Social, and Emotional Learning [CASEL].

In recent years, mindfulness-based interventions have gained wide application in adolescent emotional regulation interventions. Mindfulness enhances students' nonjudgmental awareness of emotional experiences and strengthens impulse control (Feuerborn & Gueldner, 2019). Research indicates that mindfulness-based interventions significantly improve emotional acceptance, self-regulation, and psychological resilience, while reducing symptoms of anxiety and depression. Interventions such as Mindfulness-Based Cognitive Therapy (MBCT) and school-based programs like MindUP have demonstrated strong applicability and efficacy in primary and secondary education settings.

Brinckman & Kwon (2024) emphasized that the development of emotional regulation relies heavily on supportive socialization systems within families and schools. Parental emotion socialization practices, teachers' emotional guidance, and the broader emotional climate of the school all influence students' regulatory behaviors. Warm, high-support teacher–student relationships have been shown to reduce emotional suppression and impulsive expression (Bonde et al., 2022). The emotional climate within the school context exerts a subtle yet powerful influence on students' emotional regulation.

Classroom management styles, peer interaction norms, and the overall emotional atmosphere co-construct students' attitudes and behaviors toward emotional regulation (Bonde et al., 2022).

2.5 Conceptual Framework

This study is based on the following theoretical foundations: Bandura's constructivist learning theory and social learning theory. The research primarily aims to enhance students' emotional regulation through the implementation of mindfulness-based interventions. The conceptual framework, as illustrated in Figure 1, indicates that based on constructivist learning theory, this study enhances emotion regulation in secondary school students through mindfulness-based interventions. The model mainly consists of three steps (Lead-in, leading activities, conclusion), including the following mindfulness-based interventions strategies: body awareness, body scan, loving-kindness meditation, and mindful eating. this model is designed to enhance the dependent variable, students' emotional regulation with its 4 components: awareness and understanding of emotions, acceptance of emotions, the ability to engage in goal directed behavior and refrain from impulsive behavior, when experiencing negative emotions, access to emotional regulation strategies perceived as effective.
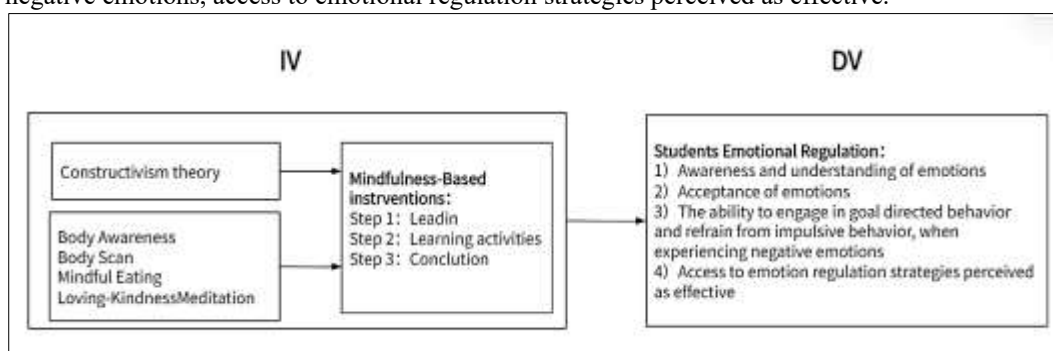
Figure 1 Conceptual Framework

3.0 METHODOLOGY

3.1 Research Design

This study adopted a mixed-methods design integrating both qualitative and quantitative approaches to comprehensively examine middle school students' emotional regulation and develop mindfulness-based interventions to enhance it. The qualitative phase focused on building a strong theoretical foundation through literature review and expert interviews, while the quantitative phase involved the construction, validation, and administration of a structured questionnaire. This sequential exploratory design ensured that theoretical insights

and expert recommendations informed the development of valid measurement tools and intervention strategies. A semi-structured interview guide was developed from the literature review to collect insights from five experts in psychology and education at Anshun University. The guide addressed three themes: (1) conceptualization and components of emotional regulation in middle school students, (2) design principles for mindfulness-based interventions, and (3) assessment methods for evaluating students' emotional regulation. Experts were selected based on strict inclusion criteria, including doctoral qualifications and active academic engagement. To ensure validity, the interview guide underwent multiple rounds of expert review and refinement. Data from the interviews were thematically analyzed to identify key constructs and practical recommendations.

3.2 Instrument Design

Building on qualitative findings, the Middle School Students' Emotional Regulation Questionnaire (MSERQ) was developed. The initial draft included 26 items distributed across four dimensions: (1) emotional awareness and understanding (6 items), (2) acceptance of emotions (6 items), (3) goal-directed behavior and impulse control under negative emotions (7 items), and (4) access to and perceived effectiveness of regulation strategies (7 items). Items were structured on four- and five-point Likert-type scales. Content validity was assessed by five experts, yielding an Item-Objective Congruence (IOC) score of 1.0.

3.3 Qualitative Phase

In the qualitative stage, the study engaged three subject-matter experts specializing in psychology and education to refine and validate the mindfulness-based intervention (MBI) program. Data collection was carried out through semi-structured interviews, allowing the experts to provide in-depth insights on the appropriateness, cultural sensitivity, and applicability of the 14 planned intervention sessions. Additionally, the Item-Objective Congruence (IOC) method was employed for content validation of the session plans, with all items achieving a perfect IOC score of 1.0. The data from interviews were analyzed thematically to identify key recommendations, ensuring that the intervention design was theoretically sound and practically relevant for middle school students.

3.4 Quantitative Phase

For the quantitative phase, a quasi-experimental design was applied, involving a total sample of 60 middle school students (grades 7–8) from Guanling Ethnic Middle School in China. Participants were randomly assigned into two groups: an experimental group (n = 30), which received the mindfulness-based intervention, and a control group (n = 30), which continued with regular school activities. Data were collected using the Middle School Students' Emotional Regulation Questionnaire (MSERQ), administered at three different time points—pre-test, immediate post-test after completion of the intervention, and a four-week follow-up assessment.

3.5 Data Analysis

The collected data were analyzed using the General Linear Model (GLM) with Repeated Measures ANOVA to examine within-group changes across time, between-group differences, and the interaction effects of time and group. This statistical approach ensured a rigorous evaluation of the intervention's effectiveness in enhancing students' emotional regulation.

4.0 RESULTS & DISCUSSION

4.1 Expert Insights on Emotional Regulation

The research found that interviews with experts indicate that the purpose of emotional regulation for middle school students is to better understand and manage their emotions. This psychological ability, which involves goal-directed behavior, action control, and emotional clarity, can impact students' academic performance and daily life. All five experts consistently highlighted the critical role of emotional regulation in students' holistic development. They underscored its significance not only for fostering self-awareness and emotional self-management but also for promoting constructive interpersonal relationships. Furthermore, emotional regulation was viewed as a foundational competency for cultivating responsible decision-making, particularly within the context of an increasingly complex and dynamic social environment.

"Emotional regulation is a key ability that involves. When individuals avoid or reject their own negative emotions, it often intensifies internal conflicts and hinders psychological development and adaptive capacity. Learning to accept uncomfortable emotions is a crucial prerequisite for cultivating psychological resilience (Expert A)".

"Emotion regulation involves the ability to stay focused on established goals when experiencing intense emotions. This capability represents a combination of emotion regulation and self-efficacy and is particularly crucial for students' persistence in learning (Expert C)".

"Impulse control is an important aspect of emotion regulation. It not only prevents emotional outbursts but also directly influences the quality of interpersonal relationships. In the teaching process, teachers' emotional regulation abilities significantly affect classroom atmosphere and student behavior (Expert D)".

"The starting point of emotion regulation is emotional clarity. Only by accurately identifying the emergence and changes of emotions can individuals respond with effective regulation. This is especially critical for students' mental health education (Expert E)".

"Concurrently, the expert interviews indicated a shared consensus regarding the overarching objective of emotional regulation for middle school students. The experts agreed that emotional regulation should equip students with the ability to effectively comprehend and manage their own emotional experiences, establish and maintain positive interpersonal relationships, and exercise sound decision-making in the face of an increasingly dynamic and complex social environment. As one expert (Expert D) noted, "Students' emotional regulation encompasses the capacity to navigate social integration, regulate internal emotional states, and interact constructively within interpersonal contexts."

"Students' emotional regulation serves as a developmental mechanism through which adolescents learn to connect with both society and those around them. It is described as a foundational learning ability that enables young individuals to manage their behaviors, adapt to emotional experiences, and engage effectively in social interactions."(Expert A).

"An associate professor of psychology, emphasized that emotional regulation involves the capacity to understand emotions, which includes not only self-awareness but also empathetic recognition of the emotional states of others.."(Expert E)

Based on literature review and expert interviews, Emotional regulation is a psychological ability that refers to "*an individual's capacity to recognize, manage, and express their emotional states in various situations. This ability is reflected in the conscious or automatic regulation of the intensity, duration, and expression of emotions, thereby enabling effective adaptation and self-management in social interactions, stress coping, and goal-directed behaviors*".

Effective emotion regulation not only helps students in a stable psychological state under academic pressure and interpersonal conflict, but also promotes positive learning motivation and a sense of self-efficacy (De Sousa et al., 2024).

Middle school students demonstrating stronger emotional regulation skills exhibit greater resilience in academic settings. Such students are more capable of managing impulses, minimizing aggressive behaviors, and enhancing academic outcomes (Zoogman et al., 2015).

Insufficient emotional regulation is closely related to the occurrence of psychological problems such as anxiety and depression (Bishop et al., 2004). Therefore, it is important to emphasize the development of emotional regulation abilities during the middle school education stage to promote students' overall development and mental health.

4.2 Descriptive Analysis of Emotional Regulation

The mean and standard deviation of emotional regulation scores for the experimental and control groups were computed at three stages pre-test, post-test, and follow-up.

Table 1 presents these descriptive statistics, offering a summary of group performance throughout the intervention period.

Table 1 Mean and standard deviation of emotional regulation (N=60)

Group	Before Experiment			After Experiment			Follow Experiment		
	M	SD	Level	M	SD	Level	M	SD	Level
Experiment Group(n=30)	1.95	0.25	Low	3.00	0.42	Moderate	3.06	0.37	Moderate
Control Group (n=30)	1.93	0.18	Low	1.96	0.17	Low	2.01	0.16	Low

Table 1 shows the emotional regulation scores of middle school students in both groups across the study period. In the experimental group, the pre-test mean was 1.95 (SD = 0.25), indicating a low level; the post-test mean increased to 3.00 (SD = 0.42), reflecting a moderate level; and the follow-up mean was 3.06 (SD = 0.37), also at a moderate level. In contrast, the control group recorded a pre-test mean of 1.93 (SD = 0.18), a post-test mean of 1.96 (SD = 0.17), and a follow-up mean of 2.01 (SD = 0.16), all remaining at a low level.

Before effectiveness of emotional regulation of middle school students in experiment group during before experiment, after experiment and follow-up. Researcher examined the assumption of normality test by Shapiro-Wink have p-value of between .06 to .10 found that the mean of emotional regulation of middle school students in experiment group during time have distributed as a normal curve and analyzed assumption of size of relationship and size of repeated variance for effectiveness of the mindfulness-based interventions to promote emotional regulation of middle school students in experiment group during before experiment, after experiment and follow-up which is shown in the table 2

Table 2 Assumption of size of relationship and size

Mauchly's W	Approx. Chi-Square	df	p	Epsilon		
				Greenhouse-Geisser	Huynh-Feldt	Lower-bound
0.34*	29.84	2	.00	0.60	0.62	0.50

*p<.05

Table 2 shows the results of Mauchly's sphericity test of emotional regulation of middle school students in experiment group during before experiment, after experiment and follow-up found sphericity assumption was violated (p=.00). Therefore, researchers use Geisser-Greenhouse correction increases the p-value.

4.3 The Comparison of Effectiveness of the Mindfulness-Based Interventions

Researcher comparison of effectiveness of the mindfulness-based interventions in improving emotional regulation of middle school students in experiment group during before experiment, after experiment and follow-up analyzed One way Repeated ANOVA which is shown in the table 3:

Table 3 The comparison of emotional regulation of middle school students in experiment group during before experiment, after experiment and follow-up (n=30)

Emotional Regulation	SS	df	MS	F	p
Time	23.41	1.21	19.38	130.50*	.00
Error	5.20	35.03	0.15		

*p<.05

Table 3 The comparison of emotional regulation of middle school students in experiment group during before experiment, after experiment and follow-up found that there was a statistically significant difference in emotional regulation between before experiment, after experiment and follow-up of .05 level (F=130.50 df=1.21 p=.00). Therefore, the researcher analyzed the emotional regulation pairwise comparison between before experiment and after experiment, between before experiment and follow-up and follow-up and after experiment by Bonferroni which is shown in the table 4.

Table 4 Pairwise comparison of emotional regulation

Pairwise Comparison of Emotional Regulation	MD	p
After experiment (M=3.00) - Before experiment (M=1.95)	1.05*	.00
Follow-up (M=3.06) - Before experiment (M=1.95)	1.11*	.00
Follow-up (M=3.06) - After experiment (M=3.00)	0.06	.31

*p<.05

Table 4 after experiment and follow-up middle school students in experiment group have emotional regulation higher before the experiment of significant at a .05 level excluding follow-up have emotional regulation higher after experiment of not significant.

Before effectiveness of the mindfulness-based interventions in improving emotional regulation of middle school students experiment group and control group during before experiment, after experiment and follow-up. Researcher examined the assumption of normality test by Shapiro-Wink have p-value of .06 to .51 found that the mean of emotional regulation of middle school students in experiment group and control group during time have distributed as a normal curve and analyzed assumption of size of relationship and size of repeated variance for effectiveness of the mindfulness-based interventions to promote emotional regulation of middle school students in experiment group and control group during before experiment, after experiment and follow-up which is shown in the table 5 .

Table 5 Assumption of size of relationship and size

Mauchly's W	Approx. Chi-Square	df	p	Epsilon		
				Greenhouse-Geisser	Huynh-Feldt	Lower-bound
0.40	52.83*	2	.00	0.62	0.64	0.50

Table 5 assumption of Mauchly's sphericity test of emotional regulation of middle school students in experiment group and control group during before experiment, after experiment and follow-up found sphericity assumption was violated (p=.00). Therefore, researchers use Geisser-Greenhouse correction increases the p-value.

Researcher comparison of effectiveness of the MBIs in improving emotional regulation of middle school students in experiment group and control group during before experiment, after experiment and follow-up which is shown in the table 6.

Table 6 The comparison of effectiveness of the mindfulness-based interventions

Emotional Regulation	SS	Df	MS	F	P
Within-Subjects					
Time	12.92	1.25	10.36	137.72*	.00
Time+Group	10.58	1.25	8.49	112.83*	.00
Error	5.44	72.31	0.08		
Between					
Group	22.54	1	22.54	164.82*	.00
Error	7.93	58	0.14		

*p<.05

Table 6 presents the comparison of emotional regulation scores between the experimental and control groups across three time points: pre-test, post-test, and follow-up. Results indicated statistically significant differences at the .05 level in emotional regulation over time (F = 137.72, df = 1.25, p < .001), between groups (F = 164.82, df = 1, p < .001), and for the time × group interaction (F = 112.83, df = 1.25, p < .001). Consequently, pairwise comparisons of emotional regulation across the three measurement points for both groups were conducted.

Table 7 The pairwise comparison of emotional regulation of middle school students in experiment group and control group during before experiment, after experiment and follow-up (n=60)

Time	Pairwise Comparison of Emotional Regulation	MD	p
Before Experiment	Experiment Group (M=1.95)–Control Group (M=1.93)	0.02	.69
After Experiment	Experiment Group (M=3.00)–Control Group (M=1.96)	1.04*	.00
Follow-Up	Experiment Group (M=3.06)–Control Group (M=2.01)	1.05*	.00

*p<.05

Table 7 After experiment and follow-up middle school students in experiment group have emotional regulation a statistically significant higher students in control group of .05 level and before experiment students in experiment group have emotional regulation a statistically significant higher students in control group of .05 level.

4.4 Discussion

The present study set out to examine the role of emotional regulation among middle school students and evaluate the effectiveness of mindfulness-based interventions (MBIs) in promoting this critical competency. Findings from expert interviews highlighted a strong consensus regarding the importance of emotional regulation as a developmental mechanism for fostering self-awareness, impulse control, social competence, and resilience. Experts consistently emphasized that emotional regulation enables students not only to understand and manage their own emotions but also to maintain constructive interpersonal relationships and exercise responsible decision-making in increasingly complex social environments. These views align with previous research that defines emotional regulation as both a self-directed and socially adaptive process involving the recognition, modulation, and expression of emotions (Thompson, 1994; Gross & Thompson, 2007).

Experts further underscored specific mechanisms of emotional regulation, such as emotional clarity, impulse control, and goal persistence. For example, Expert E noted that clarity in recognizing emotions is a prerequisite for mental health education, while Expert C highlighted the role of emotion regulation in sustaining motivation and self-efficacy under conditions of stress. Similarly, Expert D emphasized the significance of impulse control for maintaining positive relationships and effective classroom environments. These insights mirror existing literature that links emotional regulation to students' ability to cope with academic challenges, interpersonal

conflicts, and psychological stressors (De Sousa et al., 2024; Bucich, 2020). Collectively, these findings suggest that emotional regulation serves not only as an internal coping resource but also as a cornerstone of students' broader socio-emotional and academic development.

The quantitative findings provide further empirical support for the effectiveness of the mindfulness-based intervention program. Descriptive statistics showed that while the control group maintained consistently low levels of emotional regulation across all three measurements, the experimental group demonstrated significant improvements from pre-test to post-test, with gains sustained at follow-up. One-way repeated measures ANOVA confirmed that these improvements were statistically significant (F = 130.50, p < .001), and pairwise comparisons revealed that the most substantial gains occurred between pre-test and post-test. Importantly, no significant decline was observed at follow-up, indicating the durability of intervention effects.

Comparisons between experimental and control groups reinforced the intervention's impact. Results of mixed-design ANOVA demonstrated significant main effects of time, group, and the time × group interaction (all p < .001). Pairwise comparisons revealed that post-test and follow-up scores of the experimental group were significantly higher than those of the control group, confirming the intervention's effectiveness in fostering emotional regulation. These findings align with prior studies that have shown MBIs to enhance adolescents' emotion regulation, resilience, and psychological well-being (Zoogman et al., 2015).

Taken together, both qualitative and quantitative results affirm that mindfulness-based interventions can serve as an effective pedagogical strategy to enhance middle school students' emotional regulation. The findings also underscore that emotional regulation is not merely about suppressing negative affect but involves cultivating awareness, clarity, and adaptive responses to emotions. Moreover, the evidence highlights the potential of mindfulness practices to promote sustainable improvements in students' socio-emotional competencies, which in turn contribute to better academic performance and interpersonal relationships.

In sum, the study contributes to the growing body of knowledge emphasizing the integration of mindfulness practices into educational settings. It demonstrates that emotional regulation is a multifaceted construct central to students' holistic development and that structured mindfulness interventions can significantly strengthen this ability. By fostering resilience, impulse control, and emotional clarity, such interventions provide middle school students with essential tools for navigating academic pressures and social challenges, thereby promoting both mental health and learning efficiency.

5.0 CONCLUSIONS AND RECONMENDATIONS

This study demonstrated that emotional regulation is a critical competency for middle school students, enabling them to recognize, manage, and express emotions in ways that promote psychological balance, social functioning, and academic performance. Expert insights highlighted its multifaceted nature, encompassing emotional clarity, impulse control, empathy, and goal persistence, while statistical findings confirmed the effectiveness of mindfulness-based interventions (MBIs) in significantly enhancing students' emotional regulation skills. The intervention group showed marked improvements from pre-test to post-test, with gains sustained at follow-up, indicating that MBIs are not only impactful but also durable in fostering socio-emotional growth. These findings reaffirm that emotional regulation is not limited to managing negative emotions but extends to cultivating positive adaptive responses that strengthen students' resilience, interpersonal skills, and learning motivation.

Based on these findings, several recommendations are proposed. First, schools should integrate structured mindfulness-based programs into their curricula to systematically promote emotional regulation, particularly during the formative middle school years. Second, teacher training should include professional development in mindfulness techniques and socio-emotional learning strategies, equipping educators with practical tools to support students' emotional needs. Third, policymakers and education administrators should consider embedding emotional regulation frameworks within mental health and academic achievement policies, ensuring that interventions are accessible, sustainable, and contextually relevant. Fourth, parents and caregivers should be engaged in awareness programs to reinforce mindfulness practices at home, thereby strengthening the school–family partnership in promoting socio-emotional well-being. Finally, future research should explore long-term effects of MBIs across diverse student populations and examine their scalability within different cultural and educational contexts.

In conclusion, emotional regulation is foundational to students' holistic development, and mindfulness-based interventions represent a practical, evidence-based approach to nurturing these skills, ultimately contributing to healthier, more resilient, and academically successful learners.

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