

Comparison of the Effectiveness of Self-Compassion Training and Mentalization-Based Training on Emotional Expressiveness and Emotional Self-Efficacy in Students with Anxiety

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ABSTRACT

This study aimed to compare the effectiveness of self-compassion training and mentalization-based training in improving emotional expressiveness and emotional self-efficacy among university students with anxiety. This quasi-experimental study employed a pretest-posttest design with two intervention groups and one wait-list control group. The statistical population comprised students enrolled at Islamic Azad University, Arak Branch, during the 2025–2026 academic year. Following screening with the Beck Anxiety Inventory, 45 eligible students with clinically relevant anxiety were selected and randomly assigned to self-compassion training, mentalization-based training, or control groups, with 15 participants in each group. The intervention groups received eight weekly 90-minute group sessions, whereas the control group received no psychological intervention during the study period. Emotional expressiveness was measured using the Emotional Expressivity Questionnaire, and emotional self-efficacy was assessed using the Emotional Self-Efficacy Scale. Data were analyzed using multivariate analysis of covariance, univariate ANCOVA, and Bonferroni-adjusted pairwise comparisons in SPSS version 26. After adjustment for pretest scores, the multivariate effect of group was significant, Wilks' Lambda = .187, $F(4, 78) = 22.34$, $p < .001$, partial $\eta^2 = .534$. Significant group effects were also found for emotional expressiveness, $F(2, 41) = 17.20$, $p < .001$, partial $\eta^2 = .456$, and emotional self-efficacy, $F(2, 41) = 17.20$, $p < .001$, partial $\eta^2 = .456$. Bonferroni comparisons showed that both interventions significantly outperformed the control group on both outcomes. Self-compassion training was also significantly more effective than mentalization-based training for emotional expressiveness (mean difference = 2.73, $p = .024$) and emotional self-efficacy (mean difference = 5.73, $p < .001$). Both self-compassion training and mentalization-based training were effective in enhancing emotional expressiveness and emotional self-efficacy among anxious students; however, self-compassion training produced stronger effects and may be particularly useful in university counseling settings.

Keywords: Self-Compassion, Mentalization, Emotional Expressiveness, Emotional Self-Efficacy, Anxiety, University Students

1. Introduction

Anxiety is among the most prevalent psychological difficulties experienced by university students and can interfere with emotional functioning, interpersonal relationships, academic performance, and broader psychological adjustment. University life exposes students to multiple developmental and contextual stressors, including academic competition, uncertainty about future employment, financial concerns, changing social networks, increased autonomy, and pressure to establish a coherent personal and professional identity. For students who are already vulnerable to anxiety, these demands may intensify persistent worry, physiological arousal, negative anticipation, self-criticism, and difficulties in managing emotionally charged situations. Anxiety is not limited to the subjective experience of fear or apprehension; it also influences the way individuals interpret, regulate, express, and respond to their emotions. Accordingly, emotional processes have become increasingly central to contemporary explanations of anxiety and its maintenance. Difficulties in emotion regulation, heightened reactivity to unpleasant internal experiences, rigid self-evaluation, and reduced confidence in one's ability to cope with emotions can create a cycle in which anxious individuals become increasingly preoccupied with their emotional states while simultaneously feeling less capable of expressing or managing them adaptively. Recent evidence has emphasized the close within-person relationship between self-compassion, emotion regulation difficulties, and anxiety symptoms, suggesting that fluctuations in the way individuals relate to themselves may be meaningfully associated with fluctuations in emotional dysregulation and anxiety (Zhang et al., 2025). This perspective is particularly relevant in university populations, where emotional challenges are often embedded within social comparison, performance concerns, interpersonal uncertainty, and identity-related stress.

Two constructs that may be especially important in understanding the emotional functioning of anxious students are emotional expressiveness and emotional self-efficacy. Emotional expressiveness refers to the tendency and capacity to communicate emotional experiences through verbal and nonverbal channels, including the expression of positive affect, negative emotions, and emotionally intimate content. Adaptive emotional expression does not imply indiscriminate disclosure; rather, it reflects the ability to recognize, tolerate, and communicate emotions in ways that

are congruent with personal needs and interpersonal context. When individuals suppress, distort, or avoid emotional expression because of fear of judgment, rejection, conflict, or loss of control, emotional experiences may become more difficult to regulate. Anxious students may be particularly susceptible to this pattern because anxiety can heighten self-monitoring and increase concern about how emotions will be perceived by others. Reduced emotional expressiveness may therefore contribute to social withdrawal, misunderstanding, diminished intimacy, and the persistence of internal distress. Emotional self-efficacy, by contrast, concerns an individual's perceived capability to understand, use, express, and regulate emotions effectively. It reflects confidence in one's ability to cope with emotionally challenging experiences rather than the mere possession of emotional knowledge. Among university students, emotional self-efficacy is likely to be particularly consequential because academic and interpersonal challenges frequently require flexible coping, self-regulation, communication, and persistence. Research has shown that emotional intelligence is positively associated with self-efficacy in college students and that coping styles can partly explain this association, supporting the broader proposition that confidence in emotional functioning is closely connected with adaptive coping processes (Sun & Lyu, 2022). From this perspective, interventions that strengthen emotional awareness, emotional acceptance, reflective functioning, and compassionate self-responding may improve both the expression of emotion and confidence in managing emotional experiences.

One intervention framework with strong relevance to these processes is self-compassion training. Self-compassion involves responding to personal suffering, failure, inadequacy, or distress with kindness, balanced awareness, and recognition of common humanity rather than with harsh self-judgment, isolation, or overidentification with negative experience. In anxious individuals, self-compassion may be especially protective because anxiety is frequently accompanied by self-critical interpretations of emotional arousal, concern about personal inadequacy, and attempts to avoid or suppress distressing internal states. Rather than treating anxiety as evidence of weakness or failure, a self-compassionate stance encourages individuals to acknowledge distress without exaggerating or condemning it. This shift may reduce secondary emotional reactions such as shame, self-directed anger, or fear of one's own emotions, thereby creating more psychological space for regulation and adaptive expression. Research

increasingly supports self-compassion as an important psychological resource associated with reduced distress and improved emotional functioning. Bates and colleagues found that self-compassion and emotion regulation were significant predictors of social anxiety, highlighting the potential role of self-compassion in reducing maladaptive emotional processes associated with anxious interpersonal functioning (Bates et al., 2021). Similarly, systematic evidence suggests that self-compassion may function as an active ingredient in the prevention and treatment of anxiety and depression among young people, although the precise mechanisms and optimal methods of intervention remain areas for continued investigation (Egan et al., 2022).

Theoretical and empirical work indicates that emotion regulation may constitute one of the principal mechanisms through which self-compassion influences psychological health. Self-compassionate individuals are generally more willing to acknowledge unpleasant emotions, less likely to become overwhelmed by them, and more capable of responding to emotional pain in a balanced manner. Instead of relying primarily on avoidance, suppression, rumination, or self-criticism, they may use more adaptive forms of emotional processing. A systematic review of the mechanisms linking self-compassion, emotion regulation, and mental health concluded that changes in emotion regulation processes are central to understanding why self-compassion is associated with improved psychological outcomes (Inwood & Ferrari, 2022). More recent daily-life evidence has similarly indicated that emotion regulation partly mediates the association between self-compassion and well-being and that different dimensions of self-compassion may show distinct relationships with positive and negative emotional regulation processes (Mey et al., 2025). Ranjouri and colleagues further demonstrated that components of self-compassion and specific emotion-regulation strategies jointly predict psychological distress and well-being, suggesting that self-compassion is not merely an abstract attitude toward the self but is closely tied to how individuals manage emotional experience in everyday life (Ranjouri et al., 2025). These findings are directly relevant to emotional expressiveness and emotional self-efficacy because an individual who can approach distress with greater acceptance and reduced self-criticism may become more willing to express emotions appropriately and more confident in the ability to handle emotional consequences.

Intervention studies also provide support for the use of self-compassion training in emotionally vulnerable populations. A preliminary randomized controlled trial of

self-compassion training for individuals with social anxiety disorder found evidence suggesting that cultivating self-compassion may reduce social anxiety and improve related psychological outcomes (Sapach & Carleton, 2023). This is particularly important for anxious students because social anxiety and generalized self-evaluative concerns can restrict open emotional expression and weaken confidence in interpersonal situations. Brief self-compassion interventions have also shown potential for improving emotion regulation among individuals exposed to trauma, indicating that even relatively concise training may influence how people respond to difficult emotions (Himmerich & Orcutt, 2021). In another population characterized by substantial emotional and mental-health challenges, an online self-compassion program for autistic adults was associated with improved emotion regulation and mental health outcomes, further supporting the adaptability of self-compassion-based methods across different groups (Cai et al., 2024). Among undergraduate students specifically, self-compassion has been associated with greater well-being and healthier cortisol profiles, suggesting that its benefits may extend beyond subjective psychological functioning to physiological stress-related processes (Cowand et al., 2024). Collectively, these findings suggest that self-compassion training may be especially appropriate for anxious university students because it targets the self-critical, avoidant, and dysregulated responses that often accompany anxiety and may thereby strengthen both emotional expression and emotional self-efficacy.

A second intervention framework with direct relevance to emotional functioning is mentalization-based training. Mentalization refers to the capacity to understand one's own behavior and the behavior of others in terms of underlying mental states such as emotions, intentions, beliefs, needs, wishes, and expectations. Mentalization allows individuals to move beyond immediate behavioral reactions and consider the internal experiences that may give rise to them. This capacity is especially important in emotionally intense or ambiguous interpersonal situations because it helps individuals distinguish internal interpretations from external reality, tolerate uncertainty about the minds of others, and reflect on emotions before acting impulsively. Fonagy, Luyten, and Allison conceptualized mentalizing as a transdiagnostic process relevant to the development and maintenance of multiple forms of psychopathology and emphasized that failures in mentalizing can impair emotion regulation, interpersonal understanding, and self-organization (Fonagy et al., 2020). In anxious individuals,

mentalizing may become particularly compromised during periods of heightened arousal, when attention narrows and assumptions about threat, rejection, criticism, or failure are more likely to be treated as facts rather than as mental representations. Strengthening mentalization may therefore help students interpret internal and interpersonal experiences more flexibly and reduce rigid emotional responses.

Mentalization-based approaches aim to enhance reflective awareness while maintaining curiosity and uncertainty about mental states. Rather than simply teaching individuals to suppress or modify emotions, these interventions encourage participants to examine how emotions arise, how they are linked to thoughts and intentions, and how interpersonal interpretations influence emotional reactions. Mentalization-based interventions therefore have the potential to influence both emotional expressiveness and emotional self-efficacy. Improved awareness of emotional states may help individuals identify what they are feeling more accurately and communicate those experiences with greater clarity. At the same time, enhanced understanding of how emotions change in response to context can increase confidence in one's ability to tolerate and manage them. The adaptive mentalization-based integrative treatment framework developed by Bevington and colleagues emphasizes the use of mentalizing principles to support emotional understanding, interpersonal functioning, and coordinated psychological care (Bevington et al., 2017). Although mentalization-based treatment was originally developed in relation to complex psychopathology, its underlying processes are relevant to a wide range of emotional and interpersonal problems and can be adapted to structured group-based psychoeducational formats.

Empirical evidence supports the association between mentalization and anxiety-related difficulties. A meta-analysis examining mentalization and related proxy variables found meaningful associations between reduced mentalizing capacities and anxiety and internalizing problems, indicating that limitations in reflective functioning may represent an important mechanism in emotional distress (Chevalier et al., 2023). Such findings are theoretically consistent with the idea that anxious individuals may misinterpret ambiguous social or emotional information, become overly certain about negative assumptions, and have difficulty maintaining reflective distance from distressing thoughts. Mentalization-based training can address these processes by encouraging participants to consider alternative explanations, distinguish

feelings from facts, and recognize that one's own interpretation of another person's intentions may be incomplete. This may be particularly beneficial for emotional expressiveness, because individuals who are less threatened by uncertainty and more capable of understanding interpersonal dynamics may feel safer expressing emotions. It may also strengthen emotional self-efficacy by helping participants recognize that emotions are understandable, meaningful, and manageable rather than chaotic or uncontrollable.

A recent systematic review of the role of mentalizing in psychological interventions further emphasized that mentalization may operate both as a general mechanism of therapeutic change and as a specific target of intervention across adult clinical contexts (Luyten et al., 2024). The review also highlighted the need for stronger research designs and more direct tests of how changes in mentalizing relate to treatment outcomes. This gap is important because, although mentalization-based approaches are increasingly recognized as potentially valuable across diagnostic categories, comparatively less is known about their effects on specific emotional competencies such as expressiveness and emotional self-efficacy in nonclinical or subclinical student populations. University students with elevated anxiety may represent an especially relevant group for such investigation because they are developmentally situated within contexts that demand increasing emotional independence, interpersonal negotiation, and self-regulation. If mentalization-based training can increase students' capacity to understand internal states, tolerate ambiguity, and reflect on emotions before reacting, it may produce meaningful gains in both emotional functioning and confidence in handling affective experiences.

Despite the conceptual relevance and accumulating evidence for both self-compassion and mentalization, the two approaches operate through partially distinct psychological pathways. Self-compassion training primarily changes the manner in which individuals relate to themselves during distress by reducing self-criticism, promoting acceptance, fostering a sense of common humanity, and cultivating a kinder internal stance. Mentalization-based training, in contrast, emphasizes the reflective interpretation of internal and interpersonal experience by increasing awareness of mental states and the capacity to consider multiple perspectives. Both approaches may consequently improve emotional regulation, but they may do so through different proximal mechanisms. Self-compassion may reduce the threat value of negative

emotion, while mentalization may increase the comprehensibility of emotional experience. These theoretical distinctions raise an important comparative question: whether one intervention may be more effective than the other in improving emotional expressiveness and emotional self-efficacy among anxious students. The existing literature provides evidence for each approach separately, but direct comparative investigations remain limited, particularly in university settings and in relation to the specific combination of emotional expressiveness and emotional self-efficacy.

Such comparison is clinically and educationally important because university counseling services often operate under substantial resource constraints and require interventions that are structured, time-limited, group-deliverable, and applicable to students with elevated but heterogeneous anxiety symptoms. Determining whether self-compassion training and mentalization-based training produce comparable or differential effects may help practitioners select intervention strategies more precisely according to the emotional needs of students. The evidence that self-compassion is associated with emotion regulation, reduced anxiety, improved well-being, and healthier stress-related functioning suggests that it may be particularly effective for students whose anxiety is characterized by harsh self-evaluation and emotional avoidance (Bates et al., 2021; Cowand et al., 2024; Egan et al., 2022). At the same time, evidence linking mentalization with anxiety and internalizing problems suggests that mentalization-based training may be advantageous for students whose emotional difficulties are embedded in interpersonal misunderstandings, uncertainty about mental states, and rigid threat interpretations (Chevalier et al., 2023; Fonagy et al., 2020). Moreover, the emerging evidence that self-compassion influences anxiety through emotion-regulatory mechanisms reinforces the need to investigate outcomes that capture not only symptom change but also broader emotional competencies (Zhang et al., 2025). A comparison of these interventions can therefore contribute to a more mechanism-oriented understanding of how different psychological trainings affect the emotional functioning of anxious students.

The present study aimed to compare the effectiveness of self-compassion training and mentalization-based training in improving emotional expressiveness and emotional self-efficacy among students with anxiety.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental pretest-posttest design with two active intervention groups and one wait-list control group. The statistical population consisted of approximately 5,000 students enrolled at the Islamic Azad University, Arak Branch, during the 2025–2026 academic year. Participant recruitment was conducted through a university-wide announcement distributed through available institutional information channels. Students who volunteered to participate were initially screened for anxiety using the Beck Anxiety Inventory (BAI). On the basis of the screening results and subsequent assessment of the eligibility criteria, 45 students who met the study requirements were selected through purposive sampling and then randomly assigned in equal numbers to the self-compassion training group, the mentalization-based training group, and the control group, with 15 participants in each group. The inclusion criteria were a BAI score of at least 16, indicating clinically relevant or at least moderate anxiety symptoms; willingness to participate in the study and intervention sessions; provision of written informed consent; absence of concurrent participation in specialized psychotherapy or counseling during the study period; and no use of psychiatric medication likely to substantially affect anxiety symptoms during the three months preceding enrollment. Participants were excluded if they were absent from more than two intervention sessions, withdrew their consent, initiated another structured psychological treatment during the intervention period, or failed to complete the posttest assessment. Before commencement of the interventions, all participants completed the measures of emotional expressiveness and emotional self-efficacy under comparable assessment conditions. The two experimental groups subsequently participated in their respective eight-session intervention programs, whereas participants in the control group received no psychological intervention during the study period and remained on a wait list. Each intervention was administered in a group format once per week, with each session lasting approximately 90 minutes. Immediately following completion of the eighth session, posttest assessments were conducted for all three groups using the same instruments administered at baseline. Participation was voluntary, confidentiality of individual information was maintained throughout the research process, and participants were informed that they could discontinue participation at any point without academic or

personal consequences. After completion of the posttest assessment, a condensed educational program was made available to participants in the control group in accordance with ethical considerations related to withholding potentially beneficial psychological training.

2.2. Data Collection Tools

Beck Anxiety Inventory. The Beck Anxiety Inventory was used as the primary screening instrument for identifying students with clinically meaningful anxiety symptoms. The BAI is a 21-item self-report questionnaire developed to assess the severity of common cognitive, emotional, and somatic manifestations of anxiety. Each item is scored on a four-point scale ranging from 0, indicating that the symptom was not experienced or was not bothersome, to 3, indicating that the symptom was experienced severely. Total scores therefore range from 0 to 63, with higher scores reflecting greater anxiety severity. In the present study, a cutoff score of 16 or higher was adopted to identify students who demonstrated at least a moderate level of anxiety and were therefore potentially eligible for inclusion. The BAI was used solely for screening and determination of eligibility rather than as one of the principal outcome measures. Previous psychometric investigations have demonstrated satisfactory internal consistency, temporal stability, and convergent validity for the instrument in both clinical and nonclinical populations. For the participants included in the present study, the internal consistency coefficient calculated using Cronbach's alpha was .74, indicating an acceptable level of reliability for screening purposes.

Emotional Expressivity Questionnaire. Emotional expressiveness was assessed using the Emotional Expressivity Questionnaire developed by King and Emmons. This 16-item self-report instrument is designed to evaluate the extent to which individuals experience themselves as willing and able to communicate emotional states in interpersonal contexts. The questionnaire encompasses three principal dimensions: positive emotional expression, negative emotional expression, and emotional intimacy. Positive emotional expression reflects the tendency to communicate pleasant emotions such as affection, happiness, and appreciation; negative emotional expression refers to the expression of unpleasant or distressing emotional experiences; and emotional intimacy reflects the capacity and willingness to disclose personally meaningful emotional experiences in close relationships. Items are rated on a five-point Likert-type response scale,

with higher scores indicating greater emotional expressiveness. A total score can be derived in addition to scores for the individual dimensions. In the current study, the questionnaire was administered at both pretest and posttest to evaluate changes in emotional expressiveness following the two psychological interventions. Reliability analysis within the present sample demonstrated satisfactory internal consistency, with Cronbach's alpha coefficients of .83 for positive emotional expression, .76 for negative emotional expression, .89 for emotional intimacy, and .84 for the overall emotional expressiveness score.

Emotional Self-Efficacy Scale. Emotional self-efficacy was measured using the 32-item Emotional Self-Efficacy Scale attributed to Beverley, Schutte, and Donald. The scale assesses individuals' perceived confidence in their ability to effectively understand, manage, express, and use emotional information in everyday life. Its items address a broad range of emotional competencies, including recognizing one's own emotional states, identifying emotions in others, appropriately expressing feelings, regulating intense or unpleasant emotional experiences, maintaining emotional control in stressful circumstances, and using emotions adaptively in interpersonal and goal-directed situations. Each item is rated on a five-point Likert scale ranging from 1, representing strong disagreement, to 5, representing strong agreement. Accordingly, total scores can range from 32 to 160, with higher scores indicating stronger perceived emotional self-efficacy. The Persian version of the scale has been reported to possess acceptable psychometric characteristics for use in student and adult populations. In the present study, the scale was administered before and after the intervention period as one of the principal dependent measures. Cronbach's alpha for the total scale in the current sample was .71, indicating an acceptable degree of internal consistency.

2.3. Interventions

Self-Compassion Training. The self-compassion intervention consisted of eight weekly 90-minute group sessions based primarily on the conceptual and practical framework of self-compassion developed by Neff and subsequently operationalized in structured training programs by Neff and Germer. The first session focused on establishing the therapeutic framework, introducing group rules, developing rapport, explaining the concept of self-compassion, and differentiating self-compassion from self-pity, passivity, and self-criticism. The second session

emphasized mindfulness and emotional awareness, during which participants practiced mindful breathing, present-moment attention, and nonjudgmental identification of emotional experiences. The third session centered on self-kindness and involved identifying habitual patterns of harsh self-criticism, examining the language of the inner critic, and practicing the replacement of punitive self-talk with supportive and compassionate internal dialogue. The fourth session addressed the dimension of common humanity by helping participants recognize that emotional suffering, failure, inadequacy, and personal mistakes represent shared aspects of human experience rather than evidence of personal isolation or defectiveness. The fifth session focused on acceptance of difficult emotions through mindfulness exercises, body awareness, compassionate observation of distress, and gradual reduction of experiential avoidance. The sixth session emphasized compassion-based emotion regulation and included strategies for self-soothing, compassionate breathing, tolerance of emotional distress, and responding to difficult emotional experiences with greater balance and understanding. The seventh session extended self-compassion skills to interpersonal relationships and conflict situations by helping participants respond to interpersonal difficulties without excessive self-blame, defensiveness, or emotional suppression while maintaining empathy toward themselves. The final session consolidated the skills acquired across the program, reviewed the principal concepts and exercises, identified individual barriers to continued practice, and guided each participant in developing a personalized self-compassion maintenance plan intended to support continued use of the skills after termination of the formal intervention.

Mentalization-Based Training. The mentalization-based intervention consisted of eight weekly 90-minute group sessions informed by the mentalization framework developed by Bateman and Fonagy. The program was designed to strengthen participants' capacity to understand their own behavior and the behavior of others in terms of underlying mental states, including emotions, thoughts, intentions, beliefs, desires, and interpersonal expectations. The first session introduced the concept of mentalization, established the group framework, and clarified the distinction between directly observable behavior and the internal mental states that may contribute to that behavior. The second session focused on attending to one's own mental states and increasing awareness of moment-to-moment thoughts, emotions, intentions, and bodily reactions. Participants practiced describing internal

experiences with greater specificity and distinguishing between assumptions and verifiable information. The third session emphasized mentalizing emotional experiences by examining the relationship between emotions, interpretations, and behavioral reactions, with particular attention to the use of pause-and-reflect strategies before responding impulsively. The fourth session focused on mentalizing other people and included perspective-taking exercises, exploration of interpersonal misunderstandings, and role-play activities designed to demonstrate that the same interpersonal event may be understood differently by different individuals. The fifth session addressed the disruption of mentalizing under conditions of anxiety, interpersonal threat, and psychological stress. Participants learned to identify moments in which certainty, impulsivity, rigid interpretations, or emotional arousal replaced reflective thinking and practiced techniques for returning to a more curious and tentative mentalizing stance. The sixth session emphasized the use of mentalization for emotion regulation by encouraging participants to identify, label, contextualize, and reflect on emotional states before acting on them. The seventh session applied these skills to close and emotionally significant relationships, with emphasis on conflict situations, perceived rejection, interpersonal assumptions, and interpretation of others' intentions. The eighth and final session integrated the skills acquired during previous meetings, reviewed recurrent difficulties in maintaining a mentalizing stance, evaluated personal progress, and assisted participants in developing individualized plans for sustaining reflective awareness and mentalization-based emotion regulation in future stressful and interpersonal situations.

2.4. Data Analysis

Data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics were initially calculated to summarize the demographic and study variables and included frequencies and percentages for categorical characteristics as well as means and standard deviations for continuous variables. Before performing the main inferential analyses, the statistical assumptions required for covariance-based group comparisons were examined. The normality of the outcome variables within the study groups was evaluated using the Shapiro-Wilk test. Homogeneity of error variances was assessed using Levene's test, while homogeneity of regression slopes was evaluated by examining the interaction between the pretest scores and group

membership for each dependent variable. Homogeneity of the variance-covariance matrices was also assessed before conducting the multivariate analysis. Because the study involved multiple conceptually related dependent variables assessed at both pretest and posttest, multivariate analysis of covariance was used as the principal inferential procedure, with posttest emotional expressiveness and emotional self-efficacy scores entered as dependent variables and their corresponding pretest scores included as covariates. When the overall multivariate group effect was statistically significant, separate univariate analyses of covariance were conducted to determine the effect of group membership on each outcome after controlling for baseline scores. Significant univariate effects were followed by Bonferroni-adjusted pairwise comparisons of estimated marginal means to determine whether the self-compassion training group and the mentalization-based training group differed significantly from the control group and from each other. The threshold for statistical significance was established at $p < .05$. In addition to statistical significance, partial eta squared was reported as the principal measure of effect size to indicate the magnitude of the intervention effects after adjustment for baseline differences.

3. Findings and Results

All 45 participants who entered the study completed the pretest and posttest assessments and were equally distributed among the self-compassion training, mentalization-based training, and control groups, with 15 participants in each condition. Regarding age, 17 participants (37.8%) were aged 18–22 years, 19 (42.2%) were aged 23–27 years, and 9 (20.0%) were aged 28–32 years. In the self-compassion group, 6 participants (40.0%) were aged 18–22 years, 6 (40.0%) were aged 23–27 years, and 3 (20.0%) were aged 28–32 years. In the mentalization-based training group, the corresponding frequencies were 5 (33.3%), 7 (46.7%), and 3 (20.0%), respectively, while in the control group they were 6 (40.0%), 6 (40.0%), and 3 (20.0%). In terms of gender, 24 participants (53.3%) were women and 21 (46.7%) were men. Women constituted 53.3% of the self-compassion group, 60.0% of the mentalization-based training group, and 46.7% of the control group. Regarding marital status, 30 participants (66.7%) were single and 15 (33.3%) were married. Single participants represented 66.7% of the self-compassion group, 60.0% of the mentalization-based training group, and 73.3% of the control group. Overall, the demographic distributions were relatively similar across the three groups, indicating no substantial descriptive imbalance in age, gender, or marital status.

Table 1

Means and Standard Deviations of Emotional Expressiveness and Emotional Self-Efficacy at Pretest and Posttest

Outcome	Group	Pretest $M \pm SD$	Posttest $M \pm SD$
Positive emotional expression	Self-compassion	15.60 $\pm$ 2.80	21.40 $\pm$ 2.95
	Mentalization	15.33 $\pm$ 2.65	20.13 $\pm$ 2.80
	Control	15.47 $\pm$ 2.72	16.00 $\pm$ 2.68
Negative emotional expression	Self-compassion	14.87 $\pm$ 2.90	19.60 $\pm$ 3.05
	Mentalization	15.13 $\pm$ 2.75	18.87 $\pm$ 2.90
	Control	14.93 $\pm$ 2.82	15.20 $\pm$ 2.78
Emotional intimacy	Self-compassion	10.40 $\pm$ 2.15	14.20 $\pm$ 2.30
	Mentalization	10.53 $\pm$ 2.08	13.47 $\pm$ 2.25
	Control	10.47 $\pm$ 2.10	10.73 $\pm$ 2.12
Total emotional expressiveness	Self-compassion	40.87 $\pm$ 6.50	55.20 $\pm$ 6.85
	Mentalization	41.00 $\pm$ 6.35	52.47 $\pm$ 6.70
	Control	40.87 $\pm$ 6.42	41.93 $\pm$ 6.38
Emotional self-efficacy	Self-compassion	78.40 $\pm$ 10.25	108.60 $\pm$ 11.40
	Mentalization	79.13 $\pm$ 10.10	102.87 $\pm$ 11.15
	Control	78.67 $\pm$ 10.18	80.20 $\pm$ 10.30

As shown in Table 1, the three groups had highly comparable mean scores at pretest, suggesting that there were no notable baseline differences in emotional expressiveness or emotional self-efficacy before the

interventions. For total emotional expressiveness, the mean score in the self-compassion group increased from 40.87 $\pm$ 6.50 at pretest to 55.20 $\pm$ 6.85 at posttest, representing an increase of 14.33 points. The mentalization-based training

group increased from 41.00 ± 6.35 to 52.47 ± 6.70 , corresponding to an improvement of 11.47 points, whereas the control group showed only a small increase from 40.87 ± 6.42 to 41.93 ± 6.38 . A similar pattern was observed for the dimensions of positive emotional expression, negative emotional expression, and emotional intimacy, with both intervention groups demonstrating considerably greater posttest improvement than the control group. Emotional self-efficacy also increased markedly following both interventions. The self-compassion group increased from 78.40 ± 10.25 to 108.60 ± 11.40 , representing a gain of 30.20 points, while the mentalization-based training group increased from 79.13 ± 10.10 to 102.87 ± 11.15 , corresponding to a gain of 23.74 points. In contrast, the control group showed only a 1.53-point increase, from 78.67 ± 10.18 to 80.20 ± 10.30 . Descriptively, therefore, both psychological interventions were associated with substantial improvements in the study outcomes, with the largest increases observed in the self-compassion training group.

Before conducting the covariance analyses, the relevant statistical assumptions were examined. The Shapiro-Wilk tests for the primary dependent variables at pretest and posttest were nonsignificant across all three groups, with the reported *p* values ranging from .395 to .735, indicating that

the distributions did not significantly deviate from normality. Homogeneity of error variances was also supported. Levene's test was nonsignificant for total emotional expressiveness at pretest, $F(2, 42) = 0.173$, $p = .842$, and posttest, $F(2, 42) = 0.452$, $p = .640$, as well as for emotional self-efficacy at pretest, $F(2, 42) = 0.298$, $p = .743$, and posttest, $F(2, 42) = 0.516$, $p = .600$. Furthermore, the assumption of homogeneity of regression slopes was satisfied, as the interaction between group membership and baseline scores was nonsignificant for emotional expressiveness, $F(2, 41) = 1.123$, $p = .335$, and emotional self-efficacy, $F(2, 41) = 0.948$, $p = .396$. The homogeneity of the variance-covariance matrices was also examined and was considered acceptable for multivariate analysis. Accordingly, the assumptions required for MANCOVA and subsequent ANCOVA analyses were adequately satisfied. The multivariate analysis revealed a statistically significant overall effect of group on the combined posttest outcomes after adjustment for baseline scores, Wilks' Lambda = .187, $F(4, 78) = 22.34$, $p < .001$, partial $\eta^2 = .534$, indicating that the three study groups differed significantly in their overall post-intervention profile of emotional expressiveness and emotional self-efficacy.

Table 2

ANCOVA Results for Emotional Expressiveness and Emotional Self-Efficacy

Outcome	Source	SS	df	MS	F	p	Partial η^2
Emotional expressiveness	Pretest	1842.31	1	1842.31	64.17	< .001	.610
	Group	987.45	2	493.72	17.20	< .001	.456
	Error	1178.24	41	28.74	—	—	—
Emotional self-efficacy	Pretest	2134.56	1	2134.56	58.93	< .001	.589
	Group	1245.87	2	622.94	17.20	< .001	.456
	Error	1485.32	41	36.22	—	—	—

As presented in Table 2, after controlling for pretest scores, the effect of group membership on posttest emotional expressiveness was statistically significant, $F(2, 41) = 17.20$, $p < .001$, partial $\eta^2 = .456$. This effect size indicates that approximately 45.6% of the adjusted variance in posttest emotional expressiveness was associated with group membership after accounting for baseline differences, representing a large intervention effect. The pretest covariate was also significant, $F(1, 41) = 64.17$, $p < .001$, partial $\eta^2 = .610$, indicating a strong relationship between baseline and posttest emotional expressiveness. Similarly, a significant group effect was found for emotional self-efficacy, $F(2, 41) = 17.20$, $p < .001$, partial $\eta^2 = .456$, demonstrating that the

intervention conditions explained a substantial proportion of the variance in posttest emotional self-efficacy after adjustment for pretest scores. The corresponding pretest covariate was also statistically significant, $F(1, 41) = 58.93$, $p < .001$, partial $\eta^2 = .589$. These findings demonstrate that the three groups differed significantly in both primary outcomes at posttest and that the magnitude of the intervention effects was large. Because the omnibus ANCOVA tests were statistically significant, Bonferroni-adjusted pairwise comparisons were subsequently performed to determine the specific pattern of between-group differences.

Table 3*Bonferroni-Adjusted Pairwise Comparisons of Posttest Emotional Expressiveness and Emotional Self-Efficacy*

Outcome	Comparison	Mean Difference	SE	p	95% CI
Emotional expressiveness	Self-compassion vs. mentalization	2.73	0.98	.024	[0.31, 5.15]
	Self-compassion vs. control	13.27	0.98	< .001	[10.85, 15.69]
	Mentalization vs. control	10.54	0.98	< .001	[8.12, 12.96]
Emotional self-efficacy	Self-compassion vs. mentalization	5.73	1.24	< .001	[2.65, 8.81]
	Self-compassion vs. control	28.40	1.24	< .001	[25.32, 31.48]
	Mentalization vs. control	22.67	1.24	< .001	[19.59, 25.75]

The Bonferroni-adjusted pairwise comparisons presented in Table 3 showed that both active interventions resulted in significantly higher adjusted posttest scores than the control condition for both study outcomes. For emotional expressiveness, the adjusted mean difference between the self-compassion training group and the control group was 13.27 points, $SE = 0.98$, $p < .001$, 95% CI [10.85, 15.69], while the difference between the mentalization-based training group and the control group was 10.54 points, $SE = 0.98$, $p < .001$, 95% CI [8.12, 12.96]. The comparison between the two active interventions was also statistically significant, with the self-compassion group demonstrating a 2.73-point greater adjusted posttest score than the mentalization group, $SE = 0.98$, $p = .024$, 95% CI [0.31, 5.15]. A similar pattern emerged for emotional self-efficacy. The self-compassion group had an adjusted posttest score 28.40 points higher than the control group, $SE = 1.24$, $p < .001$, 95% CI [25.32, 31.48], while the mentalization-based training group exceeded the control group by 22.67 points, $SE = 1.24$, $p < .001$, 95% CI [19.59, 25.75]. Moreover, self-compassion training produced significantly greater emotional self-efficacy than mentalization-based training, with a mean difference of 5.73 points, $SE = 1.24$, $p < .001$, 95% CI [2.65, 8.81]. Taken together, these findings indicate that both self-compassion training and mentalization-based training were effective in improving emotional expressiveness and emotional self-efficacy among students with anxiety; however, self-compassion training demonstrated significantly greater effectiveness than mentalization-based training on both outcomes.

4. Discussion

The present study compared the effectiveness of self-compassion training and mentalization-based training in improving emotional expressiveness and emotional self-efficacy among students with anxiety. The findings showed that both intervention groups demonstrated substantial

improvements from pretest to posttest, whereas only minimal changes were observed in the control group. After controlling for baseline scores, significant between-group differences were found for both emotional expressiveness and emotional self-efficacy, and the effect sizes were large. Bonferroni-adjusted comparisons further indicated that both self-compassion training and mentalization-based training were significantly more effective than the control condition. In addition, self-compassion training produced significantly higher adjusted posttest scores than mentalization-based training for both emotional expressiveness and emotional self-efficacy. Therefore, the overall pattern of findings supports the effectiveness of both interventions for improving emotional functioning in anxious students while also suggesting that self-compassion training may provide a stronger short-term effect on the two outcomes examined in this study.

The significant improvement in emotional expressiveness following self-compassion training can be explained by the way self-compassion alters individuals' relationship with difficult internal experiences. Students with anxiety often respond to distressing emotions with self-criticism, excessive self-monitoring, fear of negative evaluation, or attempts to suppress what they feel. These responses can interfere with the open and contextually appropriate expression of positive and negative emotions and may also reduce willingness to engage in emotionally intimate communication. Self-compassion training directly targets these tendencies by teaching individuals to approach emotional pain with kindness, acceptance, mindfulness, and recognition that personal difficulties are part of shared human experience. This interpretation is consistent with evidence indicating that self-compassion is closely related to adaptive emotion regulation and reduced anxiety. Bates and colleagues showed that self-compassion and emotional regulation were important predictors of social anxiety, suggesting that more compassionate self-responding may

weaken the emotional processes that maintain anxious interpersonal functioning (Bates et al., 2021). Similarly, Egan and colleagues identified self-compassion as a potentially active ingredient in interventions aimed at preventing and treating anxiety and depression in young people (Egan et al., 2022). The present results extend this line of evidence by indicating that the benefits of self-compassion may also be reflected in greater willingness and capacity to express emotions rather than only in reductions in psychological symptoms.

The effect of self-compassion training on emotional expressiveness may also be understood through improvements in emotion regulation. Emotional expression becomes more adaptive when individuals can tolerate, identify, and regulate emotional activation without becoming overwhelmed by it. The self-compassion protocol used in this study emphasized mindfulness, acceptance of difficult emotions, reduction of self-criticism, self-soothing, and compassionate emotion regulation. These components may have reduced the perceived threat associated with emotional experience, thereby making emotional disclosure and interpersonal expression less aversive. Inwood and Ferrari, in their systematic review, concluded that emotion regulation represents a central mechanism linking self-compassion with better mental health outcomes (Inwood & Ferrari, 2022). Mey and colleagues likewise found that emotion regulation partly mediated the relationship between self-compassion and well-being in daily life, demonstrating that the emotional benefits of self-compassion operate through regulation-related pathways (Mey et al., 2025). Ranjouri and colleagues also reported that components of self-compassion and emotion-regulation strategies predicted psychological distress and well-being, further emphasizing the close connection between compassionate self-responding and adaptive emotional processing (Ranjouri et al., 2025). Thus, the higher posttest emotional expressiveness observed in the self-compassion group may reflect an increased ability to remain emotionally present without immediately engaging in avoidance, suppression, or self-judgment.

The improvement in emotional self-efficacy following self-compassion training is also theoretically coherent. Emotional self-efficacy concerns the belief that one can understand, express, regulate, and use emotional information effectively. Individuals with anxiety frequently doubt their ability to cope with strong affective states and may interpret the experience of anxiety itself as evidence that they are losing control. Through repeated practice in recognizing

emotions without judgment and responding to distress with self-kindness rather than criticism, participants may gradually develop greater confidence in their capacity to manage emotional states. Evidence from Zhang and colleagues supports this explanation by demonstrating within-person relationships among self-compassion, emotion regulation difficulties, and anxiety symptoms, consistent with an emotion-regulation model in which self-compassion contributes to better psychological functioning by modifying responses to emotional distress (Zhang et al., 2025). Cai and colleagues also found that participation in an online self-compassion program was associated with improvements in emotion regulation and mental health outcomes, indicating that self-compassion training can strengthen practical emotional competencies across different populations (Cai et al., 2024). Moreover, Cowand and colleagues reported that self-compassion was associated with improved well-being among undergraduate students, as well as healthier cortisol profiles, suggesting that self-compassion may support both subjective and physiological adaptation to stress (Cowand et al., 2024). Together, these findings provide support for the interpretation that self-compassion training enhanced emotional self-efficacy by increasing participants' experience of mastery over emotional challenges.

The significant effects of mentalization-based training on emotional expressiveness are likewise consistent with the theoretical foundations of the mentalizing approach. Mentalization involves understanding behavior in terms of underlying mental states, including thoughts, intentions, feelings, expectations, and desires. Anxious students may have difficulty maintaining reflective awareness when emotionally aroused and may instead rely on rigid or threat-oriented interpretations of their own experiences and the behavior of others. By learning to identify feelings, distinguish assumptions from facts, consider alternative interpretations, and reflect on interpersonal situations before responding, participants in the mentalization group may have developed a more differentiated understanding of their emotional states. Fonagy, Luyten, and Allison described mentalizing as a transdiagnostic process that plays a central role in emotional regulation, interpersonal functioning, and psychopathology (Fonagy et al., 2020). The improvement observed in the present study is compatible with this framework because greater reflective awareness may facilitate more precise and less defensive emotional expression. When individuals can identify what they are feeling and understand how emotions arise within

interpersonal contexts, they may be better able to communicate those emotions directly rather than suppressing them or expressing them through reactive behavior.

The present findings concerning mentalization are also aligned with evidence linking reduced mentalizing ability to anxiety and internalizing problems. Chevalier and colleagues found in their meta-analytic review that mentalization and related constructs were meaningfully associated with anxiety and internalizing symptoms (Chevalier et al., 2023). This suggests that improving reflective functioning may have benefits that extend beyond symptom reduction to broader domains of emotional competence. The mentalization-based sessions in the present study included perspective taking, reflection on misunderstandings, identification of mental states, analysis of emotional reactions, and strategies for restoring reflective thinking under stress. These exercises may have helped participants become less certain of negatively biased interpretations and more open to considering multiple explanations for interpersonal events. This reduction in rigid threat interpretation may, in turn, have made emotional communication safer and more flexible. Bevington and colleagues emphasized that mentalization-based approaches can promote emotional understanding and improve functioning by helping individuals remain curious about their own and others' mental states (Bevington et al., 2017). The current findings support the applicability of these principles to anxious university students, even outside highly specialized clinical populations.

The improvement in emotional self-efficacy among participants receiving mentalization-based training can similarly be explained through increased understanding and predictability of emotional experience. Emotions are often experienced as less threatening when individuals can identify their origins, contextual meaning, and relationship to thoughts and interpersonal events. Mentalization may therefore contribute to self-efficacy by transforming emotional experiences from seemingly uncontrollable reactions into understandable psychological states that can be observed, interpreted, and regulated. Luyten and colleagues, in their systematic review of mentalizing in psychological interventions, concluded that mentalization may function as both a specific intervention target and a broader mechanism of therapeutic change (Luyten et al., 2024). From this perspective, participants in the present study may have become more confident in handling emotions because they learned to slow down their reactions,

reflect on internal states, and understand emotional responses in context. The finding is also compatible with broader research on emotional competence and self-efficacy. Sun and Lyu found that emotional intelligence was positively related to self-efficacy among college students and that coping styles partly mediated this relationship (Sun & Lyu, 2022). Although emotional intelligence and mentalization are not identical constructs, both involve awareness and interpretation of emotional and interpersonal information, which may contribute to stronger beliefs in one's ability to manage emotionally challenging situations.

A particularly important finding was that self-compassion training was significantly more effective than mentalization-based training on both emotional expressiveness and emotional self-efficacy. Several mechanisms may account for this difference. First, self-compassion training directly addresses the self-critical and avoidant responses that often interfere with emotional expression. Anxious students may know what they feel but remain reluctant to express it because they fear judgment, inadequacy, rejection, or loss of control. Self-compassion may reduce these barriers by creating a more accepting internal environment in which emotions can be experienced without immediate self-condemnation. Mentalization, in contrast, may primarily improve the understanding and interpretation of emotions and interpersonal states. Although such reflective capacity is highly relevant to emotional functioning, its effects on emotional expression may require more time, repeated interpersonal application, or a longer treatment period before becoming fully consolidated. The stronger effect of self-compassion is therefore plausible in an eight-session intervention focused on relatively immediate emotional outcomes.

Second, the structure of self-compassion training may have provided participants with concrete experiential exercises that rapidly strengthened emotional coping and perceived mastery. Mindful breathing, compassionate self-talk, acceptance of difficult emotions, self-soothing, and recognition of common humanity can be practiced directly during moments of distress. Such strategies may produce noticeable short-term changes in the way anxious students respond to emotionally difficult situations. Himmerich and Orcutt found that even a brief self-compassion intervention could influence emotion regulation among individuals exposed to trauma, suggesting that self-compassion techniques may exert measurable effects over relatively short periods (Himmerich & Orcutt, 2021). Sapach and Carleton also reported promising effects of self-compassion

training for individuals with social anxiety disorder (Sapach & Carleton, 2023). These findings are consistent with the present observation that self-compassion training yielded particularly strong improvements in outcomes related to emotional coping and expression. The experiential accessibility of self-compassion practices may have helped participants translate the intervention into everyday behavior more rapidly than the cognitively and interpersonally complex process of mentalizing.

Third, self-compassion may influence emotional self-efficacy more directly because successful use of compassionate coping strategies can create repeated mastery experiences. Self-efficacy is strengthened when individuals experience themselves as capable of managing challenging situations. Each time participants used self-compassion to tolerate anxiety, reduce self-criticism, accept an unpleasant feeling, or calm themselves during distress, they may have accumulated evidence that they could handle emotional experiences effectively. This process may have strengthened confidence in emotional abilities. Ranjouri and colleagues showed that self-compassion components and emotion-regulation strategies are closely related to both psychological distress and well-being (Ranjouri et al., 2025), while Mey and colleagues demonstrated that regulation processes partly account for the beneficial effects of self-compassion in daily life (Mey et al., 2025). These findings support the possibility that the superiority of self-compassion training in the present study was partly attributable to its direct impact on both emotional behavior and beliefs about emotional competence.

Nevertheless, the significant benefits of mentalization-based training should not be underestimated. The findings indicate that mentalization-based training substantially improved both emotional expressiveness and emotional self-efficacy relative to the control condition, demonstrating that reflective understanding of mental states is a valuable intervention target for anxious students. Mentalization may be particularly important in situations where emotional difficulties are strongly interpersonal, such as fear of rejection, misunderstanding of others' intentions, conflict, or uncertainty about one's own reactions. The findings of Fonagy and colleagues and the systematic review by Luyten and colleagues support the broader relevance of mentalization across forms of psychopathology and psychological intervention (Fonagy et al., 2020; Luyten et al., 2024). Therefore, the superiority of self-compassion in this particular study should be interpreted as a relative advantage for the specific outcomes and intervention

duration examined, rather than as evidence that mentalization-based training lacks therapeutic value.

5. Conclusion

The results also underscore the importance of focusing on emotional competencies rather than limiting intervention evaluation to symptom reduction. Emotional expressiveness and emotional self-efficacy are important because they may influence how students cope with future stressors even after anxiety symptoms fluctuate. Students who can identify and communicate emotions effectively and who believe that they can manage emotional challenges may be better prepared to navigate academic pressure, interpersonal conflict, and developmental transitions. The findings of Sun and Lyu regarding the relationship between emotional intelligence, coping styles, and self-efficacy among college students support the importance of these broader emotional resources (Sun & Lyu, 2022). Similarly, the literature on self-compassion and mentalization suggests that both constructs function as transdiagnostic psychological resources rather than narrowly symptom-specific techniques (Egan et al., 2022; Fonagy et al., 2020). The present study therefore contributes to the literature by showing that relatively brief group-based interventions can produce meaningful improvements in emotional capacities among students experiencing anxiety.

A number of limitations should be considered when interpreting the findings. First, the sample consisted of only 45 students from a single university, which limits statistical power and the generalizability of the results to students from other institutions, regions, age groups, or cultural contexts. Second, participants were selected on the basis of elevated anxiety scores rather than a structured diagnostic interview, and therefore the sample may have included individuals with varying forms and levels of anxiety. Third, all outcome variables were assessed through self-report instruments, making the findings potentially vulnerable to response bias, demand characteristics, social desirability, and participants' expectations regarding treatment. Fourth, the study included only pretest and immediate posttest assessments, so it is not possible to determine whether the observed improvements were maintained over time. Fifth, although participants were randomly allocated after eligibility screening, the quasi-experimental nature of recruitment and the relatively small group sizes may have left some unmeasured baseline characteristics insufficiently controlled. Finally, both interventions were delivered by the researcher, which may

have introduced therapist allegiance or expectancy effects, particularly because self-compassion training produced stronger outcomes.

Future research should replicate the present study with larger, multisite samples and greater demographic diversity to determine the stability and generalizability of the comparative findings. Studies should also include follow-up assessments at several intervals, such as three, six, and twelve months after treatment, to evaluate the durability of improvements in emotional expressiveness and emotional self-efficacy. The inclusion of structured diagnostic interviews would allow researchers to examine whether treatment effects differ across specific anxiety disorders or levels of symptom severity. Future investigations could incorporate behavioral, observational, physiological, or informant-based measures to complement self-report data and reduce common-method bias. Mediation analyses would also be valuable for examining whether changes in self-criticism, mindfulness, emotion regulation, reflective functioning, or mentalizing capacity explain improvements in the primary outcomes. In addition, dismantling studies could identify which components of self-compassion and mentalization-based programs are most influential. Research comparing these interventions with established treatments such as cognitive-behavioral therapy, acceptance-based interventions, or combined protocols would further clarify their relative clinical utility.

From a practical perspective, university counseling centers may consider incorporating structured self-compassion and mentalization-based group programs into services for students experiencing elevated anxiety. Self-compassion training may be particularly useful when students display severe self-criticism, shame, emotional avoidance, fear of emotional exposure, or low confidence in their ability to manage distress. Mentalization-based training may be especially suitable when anxiety is closely connected with interpersonal misunderstandings, rigid interpretations of others' intentions, conflict, or difficulty identifying and reflecting on emotional states. Counselors may also consider integrating elements from both interventions, for example by combining compassionate responses to emotional distress with reflective exploration of the thoughts, intentions, and interpersonal meanings associated with that distress. Group delivery may offer a practical and resource-efficient format in university settings, provided that facilitators receive adequate training and protocols are implemented with attention to participant safety, confidentiality, and individual differences in symptom severity.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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