

# **Mindfulness Training and Emotion Regulation: The Mediating Role of Psychological Resilience**

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### **Abstract**

Emotion regulation is a core component of mental health, and mindfulness-based interventions have been proposed to strengthen it in part by cultivating psychological resilience. The present study examined whether psychological resilience mediates the effect of a brief mindfulness training on emotion regulation in young adults. Sixty university students were randomly assigned to a six-week Mindfulness-Based Stress Reduction program ( $n = 31$ ) or to an active six-week Health Enhancement Program control ( $n = 29$ ). Trait mindfulness, psychological resilience, and the two emotion regulation strategies indexed by the Emotion Regulation Questionnaire–Short Form (cognitive reappraisal and expressive suppression) were assessed before and after the intervention. Four hypotheses were tested with mixed-design analyses of variance and two simple mediation models, with condition as the predictor and change in psychological resilience as the mediator. The manipulation check showed that the mindfulness training did not produce a significantly larger increase in trait mindfulness than the active control. Consistent with this, the training did not produce significantly larger gains than the control on psychological resilience, cognitive reappraisal, or expressive suppression. The indirect effect of training on either emotion regulation subscale through change in psychological resilience was not statistically significant. At baseline, psychological resilience was positively correlated with cognitive reappraisal but not with expressive suppression, and trait mindfulness was unrelated to the other variables. The findings provide no evidence that psychological resilience mediated the effect of a short, active-controlled mindfulness training on emotion regulation in healthy young adults; the null pattern was anchored by the absence of a measurable training effect on the mindfulness construct itself and constrains the conclusions that can be drawn.

*Keywords:* Psychological resilience, mindfulness, emotion regulation

## **Mindfulness Training and Emotion Regulation: The Mediating Role of Psychological Resilience**

Emotion regulation is a vital component of mental health. The World Health Organization (WHO) in 2024 reported that 4 to 6% of the global population experiences difficulties in emotion regulation in daily life. In light of these challenges, mindfulness has emerged as a prominent intervention since the practice of mindfulness is associated with healthier emotion regulation (Roemer, Williston, & Rollins, 2015). However, the conditions under which mindfulness training reliably improves emotion regulation, and the psychological mechanisms through which it does so, remain incompletely understood.

Mindfulness is a psychological concept that entails the self-regulation of attention to present-moment experiences while fostering a nonjudgmental awareness of those experiences (Bishop et al., 2004). It is sometimes defined by two essential elements: the consciousness of the present moment and the nature of that consciousness, distinguished by attributes such as acceptance, inquiry, and non-judgment (Kabat-Zinn, 1990). While everyone has the capacity for mindfulness to some degree, it can be intentionally developed through easy activities or more structured programs (Baer, 2003). Mindfulness training involves teaching or acquiring mindfulness skills over time, such as non-reactive awareness of thoughts, feelings, and bodily sensations, typically through an 8-week program (Baer, 2003). These programs often include guided meditation, breathing exercises, and practices designed to enhance present-moment awareness and focused attention. The proposed underlying mechanism is that sustained attention to present experience, combined with non-judgmental observation, reduces automatic reactivity to emotional cues and creates space in which more adaptive regulatory strategies can be applied (Brown & Ryan, 2003; Shapiro, Carlson, Astin, & Freedman, 2006). On this basis, mindfulness-based therapies have been shown to improve psychological well-

being and to reduce symptoms of anxiety and depression (Grossman, Niemann, Schmidt, & Walach, 2004; Hofmann, Sawyer, Witt, & Oh, 2010).

Emotion regulation describes the mechanism by which individuals control the emotions they feel, when they experience them, and the manner in which they express and regulate them (Gross, 1998, p. 275). This involves adjusting emotional responses instead of eradicating them, and adopting adaptive behaviors to fulfill environmental needs (Aldao, 2013). Not all emotion regulation strategies are equally adaptive: cognitive reappraisal, problem-solving, and mindful acceptance tend to predict better psychological outcomes, whereas habitual expressive suppression and rumination are associated with poorer outcomes (Aldao, 2013; Webb, Miles, & Sheeran, 2012). This asymmetry has a mechanistic explanation grounded in the process model of emotion regulation (Gross, 1998, 2015). The process model holds that emotion regulation strategies can operate at different stages of an unfolding emotional response: situation selection or modification, attention deployment, and cognitive change (e.g., reappraisal) act before the emotional response is fully generated, whereas response modulation (e.g., suppression) acts after the response is underway (Gross, 1998, 2015; Webb et al., 2012). Antecedent-focused strategies such as reappraisal therefore reduce the intensity of negative affect at its source, while response-focused strategies such as suppression incur cognitive and physiological costs without altering the underlying emotional experience (Gross & John, 2003; John & Gross, 2004). Effective emotion regulation is consequently central to managing adverse emotions and to mitigating mental-health problems such as anxiety, depression, and substance use (Gratz & Roemer, 2004).

Beyond the moment-to-moment strategies people use, the broader capacity to adapt to ongoing stressors also shapes emotional functioning. Psychological resilience, the construct central to the present study, refers to a trait, process, or outcome by which individuals adapt positively to challenges and stressors over time (Campbell-Sills, Cohan, & Stein, 2006).

Fletcher and Sarkar (2013) describe it as the capacity to "bounce back" after difficult or challenging life events. However, resilience involves more than recovery: it also encompasses positive adaptation, personal growth, and the development of new coping strategies that help individuals thrive despite adversity (Vella & Pai, 2019). Psychological resilience is distinct from emotional resilience, which refers more narrowly to the ability to manage emotional stressors (Tugade & Fredrickson, 2007). Psychological resilience, by contrast, also incorporates cognitive flexibility and the capacity to remain focused and in control during difficult times (Kashdan & Rottenberg, 2010). This scope, integrating emotional experience with ongoing cognitive processing, makes psychological resilience particularly relevant for understanding how people apply emotion regulation strategies under stress: the cognitive-flexibility component supports selection of antecedent-focused strategies such as reappraisal, which the process model identifies as the more adaptive route (Gross, 1998; Polizzi & Lynn, 2021).

The link between mindfulness and emotion regulation can be described as a sequence of skills cultivated by mindfulness practice. First, sustained attention to the present moment increases awareness of emotional experiences as they arise (Bishop et al., 2004; Brown & Ryan, 2003). Second, observing those experiences with a non-judgmental stance reduces automatic reactivity, creating a brief pause between stimulus and response (Chambers, Gullone, & Allen, 2009; Shapiro et al., 2006). Third, this pause enables more flexible selection of regulatory strategies, with greater reliance on antecedent-focused strategies such as cognitive reappraisal and reduced reliance on response-focused strategies such as expressive suppression (Hofmann et al., 2010; Keng, Smoski, & Robins, 2011). Consistent with this account, greater dispositional mindfulness is associated with more frequent reappraisal and less habitual suppression (Keng et al., 2011), and mindfulness predicts greater psychological flexibility, a known correlate of well-being (Kashdan & Rottenberg, 2010). At

the meta-analytic level, mindfulness-based interventions produce moderate reductions in anxiety and depressive symptoms (Grossman et al., 2004; Hofmann et al., 2010), in keeping with their proposed effects on emotion regulation.

The relationship between psychological resilience and emotion regulation is generally understood as bidirectional, but each direction operates through distinct mechanisms. In one direction, the habitual use of adaptive emotion regulation strategies supports resilience over time: people who regulate negative affect through reappraisal rather than suppression recover more quickly from stressors, and they accumulate the positive affect that broadens cognitive and behavioural repertoires over the longer term (Fredrickson, 2001; Tugade & Fredrickson, 2004, 2007). In the other direction, psychological resilience supports the deployment of adaptive emotion regulation strategies: more resilient individuals draw on greater cognitive flexibility and a broader regulatory repertoire to select strategies that fit the demands of the situation, rather than defaulting to maladaptive responses such as habitual suppression or rumination (Polizzi & Lynn, 2021; Troy, Willroth, Shallcross, Giuliani, Gross, & Mauss, 2023). Polizzi and Lynn's (2021) systematic review concluded that this second direction is reliably positive across studies but context-sensitive, suggesting that resilience does not translate uniformly into more effective regulation without supportive psychological conditions.

Evidence on the link between mindfulness training and psychological resilience is also encouraging. Pidgeon and Pickett (2017) found that students who participated in mindfulness training demonstrated increased resilience and more efficient adaptive coping techniques, suggesting that mindfulness-based therapies may improve resilience and reduce psychological distress. The mechanism behind this may be explained by the mindfulness-to-meaning theory, which suggests that mindfulness increases metacognitive awareness and decreases experiential avoidance (Garland et al., 2015). According to this view, mindfulness

helps individuals reframe stressful events with greater perspective and emotional balance, thereby promoting adaptive coping and resilience. Additionally, mindfulness fosters self-regulation and acceptance (Shapiro et al., 2006), which enhances psychological flexibility, a key component of resilience. This highlights the potential benefits of mindfulness training in fostering resilience. Nemati et al. (2023) showed that an integrated program incorporating resilience and mindfulness training positively influenced students' psychological well-being, indicating that the amalgamation of these practices can significantly enhance overall mental health. The evidence supports a directional model in which mindfulness training strengthens psychological resilience, which in turn facilitates more effective emotion regulation (Hayes & Feldman, 2004; Shapiro et al., 2006; Polizzi & Lynn, 2021; Troy et al., 2023). This resilience-as-mediator path is the core mechanism that the present study tests.

A central challenge in this literature is the ambiguity in findings across studies. Some studies report clear positive links, suggesting that mindfulness enhances both emotional control and resilience (Pidgeon & Pickett, 2017; Shapiro et al., 2006). Others show only weak or indirect links. Desrosiers, Vine, Klemanski, and Nolen-Hoeksema (2013) reported that the mechanisms linking mindfulness to emotion regulation differed between depressed and anxious samples: for depression, mindfulness operated primarily through reductions in rumination, whereas for anxiety, it operated primarily through reductions in worry and experiential avoidance. Keng et al. (2011), across a broad empirical review, concluded that the size of the mindfulness–well-being association depends heavily on sample composition (clinical vs. non-clinical), outcome measure, and intervention intensity. Three factors plausibly drive these inconsistencies. First, measurement: the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is widely used but indexes only the attention-and-awareness facet of mindfulness, whereas other instruments additionally tap acceptance and non-reactivity components (Bishop et al., 2004). Studies that rely on different instruments

therefore do not strictly measure the same construct, which can produce divergent effect estimates. Second, operationalization: effects observed for dispositional trait mindfulness do not necessarily generalize to mindfulness as a structured intervention, and meta-analytic evidence indicates that shorter mindfulness programs can produce reliable effects on stress and well-being in healthy samples, though typically with smaller and more variable effect sizes than the full eight-week protocol (Carmody & Baer, 2009; Khoury, Sharma, Rush, & Fournier, 2015). Third, sample: young-adult non-clinical samples often report relatively high baseline functioning, which can reduce room for change and produce attenuation effects (Campbell-Sills et al., 2006). Theoretical perspectives also differ on whether resilience functions primarily as a mediator, a moderator, or an outcome of the mindfulness–emotion regulation relationship, and these roles are not mutually exclusive: resilience may operate as a mediator of acute training effects while simultaneously moderating responsiveness to future stressors, and accumulating as an outcome over repeated practice (Garland et al., 2015; Troy et al., 2023). This variation motivates research that evaluates the relationships under a single, cohesive framework in young adults, a group with documented vulnerability to emotion-regulation difficulties.

To our knowledge, this is among the first experimental studies to test psychological resilience specifically, as distinct from the more frequently studied emotional resilience, as a mediator between mindfulness training and emotion regulation, with a particular focus on young adults. Psychological resilience is anticipated to function as a mediator between mindfulness training and emotion regulation, given that mindfulness fosters self-regulation and emotion equilibrium, which are essential elements of resilience (Shapiro et al., 2006; Garland et al., 2015). Pidgeon and Pickett (2017) and Nemati et al. (2023) have shown that mindfulness training enhances resilience-related outcomes in student samples, providing a

rationale for evaluating psychological resilience as the mechanism through which mindfulness training reaches emotion regulation.

The distinction between psychological and emotional resilience has concrete empirical consequences. Wang, Xu, and Luo (2016) reported that emotional resilience mediated the mindfulness–emotion regulation association, but that work leaves open whether the broader construct of psychological resilience operates the same way. The two additional components of psychological resilience are theoretically relevant for emotion regulation. Cognitive flexibility, the ability to consider alternative interpretations and switch perspective on a stressor, is the cognitive substrate of cognitive reappraisal, which is itself the antecedent-focused strategy most consistently linked to better outcomes (Gross, 1998, 2015; Garland et al., 2015). Metacognitive awareness, the ability to observe one's own thoughts and feelings as mental events rather than as facts, supports the decentring that mindfulness is theorized to cultivate (Bishop et al., 2004; Shapiro et al., 2006), and that decentring is in turn what allows reappraisal to be applied effectively. If mindfulness training exerts its effects on emotion regulation by reshaping how people interpret and integrate emotion-eliciting events (Garland et al., 2015), psychological resilience, with its cognitive-flexibility and metacognitive components, should be a more sensitive mediator than the recovery-focused emotional resilience construct.

Contextual factors further shape how mindfulness, resilience, and emotion regulation interact. Arpaci and Tanriverdi (2024) reported that mindfulness may correlate negatively with emotion regulation in individuals with depression, particularly under conditions of chronic emotional distress or rumination, suggesting that baseline symptom burden can shift how mindfulness translates into regulation outcomes. Abedini, Akbari, Sadeghi, and Asadi Majareh (2021) similarly found that emotion regulation did not mediate the mindfulness–resilience relationship in a clinical (cancer-patient) sample. These findings indicate that

clinical status is a contextual moderator of the mindfulness–resilience–emotion regulation chain, and they motivate the study of the chain in a non-clinical young-adult sample, where baseline distress is lower and the mechanism can be tested without the additional variance introduced by symptom burden. The present study therefore restricts the sample to non-clinical young adults, not to make claims about generalizability across populations, but to provide a cleaner test of the proposed mediation in a group where confounding by clinical-range symptoms is minimized, and tests the mediation experimentally against an active control rather than cross-sectionally, in order to isolate effects attributable to mindfulness from the non-specific effects of any structured group programme (MacCoon et al., 2009).

Clarifying the role of psychological resilience in this process also has practical relevance. Emotional resilience has already been examined as a mediator of mindfulness effects on emotion regulation (Wang et al., 2016); psychological resilience adds the cognitive-flexibility and metacognitive components most plausibly engaged by mindfulness training (Kashdan & Rottenberg, 2010). If psychological resilience mediates the effect of mindfulness on emotion regulation, integrated mindfulness-and-resilience programmes may be especially useful in populations under chronic stress, including healthcare staff and other high-demand occupational groups (Cullen & Pons, 2015; Jiménez-Picón et al., 2021; Cohen et al., 2022). Given this, the aim of the present study was to examine the mediating role of psychological resilience in the relationship between mindfulness training and emotion regulation. Participants were randomly assigned to either an experimental group, which received a six-week mindfulness-based program (MBSR), or a control group, which participated in the Health Enhancement Program (HEP). The HEP (MacCoon et al., 2009) was purposely chosen as an active control rather than a wait-list: it is matched to MBSR in duration, group format, instructor contact time, and home-practice expectations, but contains no mindfulness-specific content (covering nutrition, exercise, music therapy, functional

mobility, and creativity). Benchmarking MBSR against HEP therefore provides a stricter test of mindfulness's specific contribution, because non-specific effects, attention from a trainer, group contact, expectancy of benefit, and the general well-being gains associated with any structured program, are present in both conditions and cannot, on their own, account for a between-group difference. Four hypotheses were tested:

*H1:* The mindfulness training (MBSR) will lead to a significantly greater increase in psychological resilience than the HEP control condition.

*H2:* The mindfulness training (MBSR) will lead to a significantly greater improvement in emotion regulation than the HEP control condition.

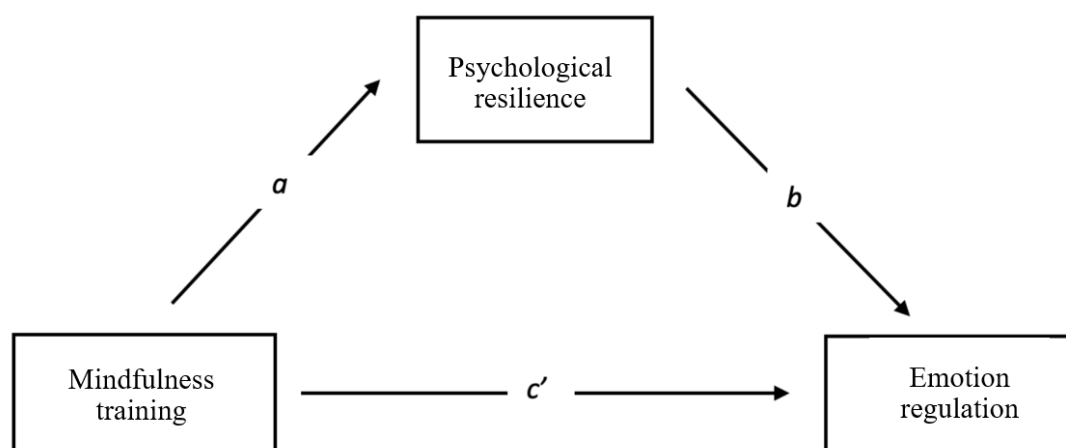
*H3:* Change in psychological resilience will significantly predict change in emotion regulation.

*H4:* Psychological resilience will partially mediate the effect of the mindfulness training (MBSR vs HEP) on emotion regulation.

The conceptual model underlying these hypotheses is presented in Figure 1.

**Figure 1**

*Conceptual Model of Study Variables*



*Note.* Signs indicate the predicted direction of each relationship.

Mindfulness Training is expected to be positively associated with Psychological Resilience (left diagonal), Psychological Resilience with Emotion Regulation (right diagonal), and Mindfulness Training directly with Emotion Regulation (bottom, direct path). The indirect (mediational) effect tested in H4 is the product of the two diagonal paths.

## **Method**

### **Participants**

Sixty adults (46 women, 14 men;  $M = 22.00$  years,  $SD = 4.33$ ) completed the study and were included in the analyses. Participants were recruited through advertising, social media, and the Erasmus School of Social and Behavioral Sciences participant pool, with course credit offered where applicable. Eligibility required an age of 18 years or older and completion of both the baseline and post-intervention online surveys alongside attendance at the six training sessions. Exclusion criteria were participation in a formal multi-week meditation training within the past year, current meditation practice of more than three times per week, and a diagnosed mental disorder. Of the final sample, 31 participants were randomly assigned to the mindfulness-based training condition (MBSR) and 29 to the Health Enhancement Program (HEP) control condition. The participants' demographic characteristics are presented in Table 1.

**Table 1***Participant Demographics*

| Variable | N  | %    | M  | SD   |
|----------|----|------|----|------|
| Age      | 60 |      | 22 | 4.33 |
| Women    | 46 | 76.7 |    |      |
| Men      | 14 | 23.3 |    |      |
| MBSR     | 31 | 51.7 |    |      |
| HEP      | 29 | 48.3 |    |      |

*Note.* *M* = Mean; *SD* = Standard Deviation.

An a priori power analysis indicated that detecting a medium-sized effect in the mediation analysis ( $f^2 = 0.15$ ) with 80% power and a two-tailed  $\alpha = .05$  required a sample size of 68. All participants provided informed consent and were informed about the study's purpose, procedures, confidentiality, and their right to withdraw at any time. The study was approved by the ethics review board of the Erasmus School of Social and Behavioral Sciences.

**Measures***Psychological Resilience*

The Connor-Davidson Resilience Scale (CD-RISC-2; Connor & Davidson, 2003) was used to assess participants' psychological resilience. The CD-RISC-2 is a two-item short form of the original 25-item CD-RISC, intended to capture an individual's capacity to adapt to change and recover from adversity. Each item is rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), and the two items are averaged so that higher mean scores reflect greater psychological resilience. Mean scores range from 1 to 5, while total scores range from 2 to 10, with higher scores indicating greater resilience. The CD-RISC-2

has demonstrated acceptable psychometric properties across diverse populations, including U.S. community samples (Connor & Davidson, 2003) and Chinese samples (Yu & Zhang, 2007; Ni et al., 2016), supporting its use as a brief index of resilience in research settings.

### ***Emotion Regulation***

The Emotion Regulation Questionnaire-Short Form (ERQ-S; Preece et al., 2023) was used to assess participants' habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression. The ERQ-S is a 6-item self-report scale adapted from the original 10-item ERQ (Gross & John, 2003). Each item is rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cognitive reappraisal is indexed by items 1, 3, and 5 and expressive suppression by items 2, 4, and 6. Following the convention used in the original ERQ (Gross & John, 2003) subscale scores were computed as the mean of the relevant items and were analysed separately rather than as a single composite, given that cognitive reappraisal and expressive suppression are theoretically distinct strategies that often diverge in their associations with adjustment outcomes (Gross & John, 2003). Subscale mean scores range from 1 to 7, while total scores range from 6 to 42, with higher scores reflecting more frequent use of the corresponding strategy. The ERQ-S has shown good internal consistency in prior work, with Cronbach's  $\alpha = .87$  for expressive suppression and .76 for cognitive reappraisal (Preece et al., 2023).

### ***Trait Mindfulness***

Trait mindfulness was assessed at baseline and post-intervention using the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003; Carlson & Brown, 2005). The MAAS is a 15-item self-report measure of the frequency of mindful attention and awareness everyday experience. Each item is rated on a 6-point scale ranging from 1 (*almost always*) to 6 (*almost never*). Higher scores indicate higher levels of trait mindfulness, with possible total scores ranging from 15 to 90. The MAAS has shown good internal consistency in prior work

(Cronbach's  $\alpha = .89$ ; MacKillop & Anderson, 2007), supporting its use as a reliable index of trait mindfulness in this sample.

## **Procedure**

The study employed an experimental design with two assessment points: one conducted prior to the intervention and one following it. Participants were first screened through an online survey to determine whether they meet the inclusion and exclusion criteria. Eligible participants indicated their availability for training sessions and were assigned to a corresponding time slot. Allocation to condition (MBSR or HEP) was randomized through the Erasmus Academic Registration System (ERAS) and was independent of time-slot preference. Participants were permitted to miss up to two of the six training sessions, provided they remained actively engaged with both the sessions and the assigned home exercises.

Both training programs were delivered in parallel in two modalities: in-person sessions at Erasmus University and online sessions conducted via Microsoft Teams, with breakout rooms used for small-group discussion in the online format. Each participant completed all six sessions in a single modality. Instruction was provided in either English or Dutch, depending on participant preference. Each group, whether in person or online, was supported by two instructors who alternated in presenting the content.

Before the first training session, participants completed an online survey on the Qualtrics platform that collected demographic information and the three primary measures (MAAS, ERQ-S, CD-RISC-2). After the final training session, participants completed the same questionnaire battery a second time, again via Qualtrics, to allow pre- to post-intervention change to be assessed.

The mindfulness program was delivered in weekly 75-minute sessions across six consecutive weeks, following the Workplace Mindfulness Training 60 (Bartlett et al., 2019) and the practical guide by Williams and Penman (2011), drawing on elements of standard MBSR (Kabat-Zinn, 1982) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002). The weekly topics were (1) focusing attention on the present moment, (2) Observing the mind–body connection and bodily sensations, (3) mindful movement and engagement with activity, (4) relating differently to thoughts and cultivating an adaptive mindset, (5) mindful acceptance of unpleasant experiences, and (6) setting intentions and developing meaningful goals. Each session consisted of structured topic presentations, formal exercises (e.g., body-scan meditation), and guided group discussion. Participants received weekly handouts with formal and informal home-practice exercises requiring up to 30 minutes of practice per day and had the option to read *Mindfulness: An Eight-Week Plan for Finding Peace in a Frantic World* (Williams & Penman, 2011) alongside the programme.

The Health Enhancement Program (HEP) control condition also ran for six weeks with 75-minute weekly sessions, following the HEP Manual (MacCoon et al., 2009). It covered four major components, nutrition, music therapy, physical activity, and functional movement, matched to the MBSR program in session duration and exercise structure (MacCoon et al., 2009). Weekly topics were (1) integration of exercise with nutrition, (2) music therapy and its role in relaxation and mental well-being, (3) functional mobility and the benefits of physical activity, (4) the relationship between nutrition and exercise, (5) creativity and mental health, and (6) long-term motivation and personal inspiration. Participants received weekly handouts with home-practice exercises matched in type and duration to those in the MBSR condition.

After completing the six-week program, participants were contacted by email and asked to complete the post-intervention assessment on Qualtrics. Trainers remained in contact during this stage to encourage completion and to address any remaining questions. Upon submission of the post-assessment, participants were debriefed via email and thanked for their participation. To mitigate any potential inequity arising from random allocation, participants in the HEP condition were offered free access to the mindfulness training six months after the trial ended.

### **Statistical Analyses**

Four hypotheses were tested. Hypothesis 1 (training effect on psychological resilience) was tested with a  $2 \times 2$  mixed-design ANOVA, with Time (pre, post) as the within-subjects factor and Condition (MBSR, HEP) as the between-subjects factor; the Time  $\times$  Condition interaction was the critical test. Hypothesis 2 (training effect on emotion regulation) was tested with two parallel  $2 \times 2$  mixed-design ANOVAs, one with cognitive reappraisal as the outcome and one with expressive suppression as the outcome. Hypotheses 3 (whether change in psychological resilience predicts change in emotion regulation) and 4 (whether psychological resilience mediates the effect of the training on emotion regulation) were tested with two simple mediation models using the PROCESS macro for SPSS (Hayes, 2017, 2022; Model 4), with Condition (0 = HEP, 1 = MBSR) as the independent variable and change in psychological resilience as the mediator; the outcome was change in cognitive reappraisal in the first model and change in expressive suppression in the second. Change scores were computed as post-intervention minus pre-intervention values for each measure. Each indirect effect was estimated with 5,000 bootstrap resamples and was considered statistically significant if its 95% percentile confidence interval did not include zero; the direct, indirect, and total effects are reported. In addition, a  $2 \times 2$  mixed-design ANOVA on trait mindfulness scores served as a manipulation check to verify whether the training

increased self-reported mindfulness, and independent-samples t-tests on pre-intervention scores served as a baseline equivalence check. Pearson correlations among baseline variables were computed to examine associations between mindfulness, resilience, and emotion regulation strategies.

Prior to inferential testing the data were screened for missingness and for potential outliers via z-score inspection on each change score. One influential case ( $|z| > 3.29$  on change in psychological resilience) was identified and retained for the primary analyses; a sensitivity check excluding this case yielded substantively identical results. Range checks on the Likert items were not necessary because the survey platform constrained responses to each scale's valid range at the point of entry (MAAS 1–6, ERQ-S 1–7, CD-RISC-2 1–5). The assumptions of the mediation analysis (normality of residuals, linearity, and homoscedasticity) were evaluated through histograms of standardized residuals, scatterplots, and Q–Q plots; the corresponding checks for the ANOVAs were also conducted before interpreting each model. All scores were computed as the arithmetic mean of the items on each scale. All statistical tests used a two-tailed  $\alpha = .05$ .

## **Results**

### **Descriptive Statistics**

The final sample consisted of 60 participants, randomly assigned to either the mindfulness training group (MBSR;  $n = 31$ ) or to the Health Enhancement Program control group (HEP;  $n = 29$ ). Assumptions of normality, linearity, and homoscedasticity were examined prior to each inferential test and met, with minor exceptions noted where relevant.

Table 2 presents the descriptive statistics for trait mindfulness, psychological resilience, and the two emotion regulation strategies (cognitive reappraisal and expressive suppression) in the MBSR and HEP groups before and after the intervention. Across the whole pre-intervention sample, trait mindfulness sat close to the midpoint of the Mindful

Attention Awareness Scale (overall  $M = 3.44$ ,  $SD = 0.94$ ), psychological resilience was somewhat above the midpoint of the Connor-Davidson Resilience Scale (overall  $M = 3.84$ ,  $SD = 0.75$ ), cognitive reappraisal was above the midpoint of its subscale (overall  $M = 5.07$ ,  $SD = 1.30$ ), and expressive suppression was somewhat below the midpoint (overall  $M = 3.58$ ,  $SD = 1.63$ ). Together these values suggest a sample with moderately high baseline trait mindfulness and psychological resilience, frequent use of cognitive reappraisal, and relatively low habitual reliance on expressive suppression.

Independent-samples  $t$ -tests on pre-intervention scores indicated that the two conditions were equivalent at baseline on trait mindfulness,  $t(58) = 1.45$ ,  $p = .153$ , 95% CI of the difference  $[-0.13, 0.83]$ , Cohen's  $d = 0.37$ ; on cognitive reappraisal,  $t(58) = 1.32$ ,  $p = .193$ , 95% CI  $[-0.23, 1.11]$ , Cohen's  $d = 0.34$ ; and on expressive suppression,  $t(58) = 0.38$ ,  $p = .705$ , 95% CI  $[-0.69, 1.01]$ , Cohen's  $d = 0.10$ . The two conditions differed significantly at baseline on psychological resilience,  $t(58) = 2.35$ ,  $p = .022$ , 95% CI  $[0.07, 0.81]$ , Cohen's  $d = 0.61$ , with the HEP group scoring higher (HEP  $M = 4.07$ ,  $SD = 0.58$ ; MBSR  $M = 3.63$ ,  $SD = 0.84$ ). This pre-existing imbalance on psychological resilience is taken into account when interpreting the ANOVA for resilience below and again in the Limitations section.

At post-intervention, the MBSR group scored on trait mindfulness  $M = 3.49$  ( $SD = 0.64$ ), psychological resilience  $M = 3.84$  ( $SD = 0.78$ ), cognitive reappraisal  $M = 5.17$  ( $SD = 1.05$ ), and expressive suppression  $M = 3.66$  ( $SD = 1.61$ ); the HEP group scored on trait mindfulness  $M = 3.54$  ( $SD = 1.06$ ), psychological resilience  $M = 4.16$  ( $SD = 0.76$ ), cognitive reappraisal  $M = 5.43$  ( $SD = 1.17$ ), and expressive suppression  $M = 3.71$  ( $SD = 1.72$ ). All four primary measures showed small numerical increases from pre to post in both groups, except for trait mindfulness in HEP, which decreased slightly ( $-0.08$ ). The largest numerical increases were observed in the MBSR group for trait mindfulness ( $+0.21$ ) and cognitive reappraisal ( $+0.31$ ).

**Table 2***Outcome Variables Before and After the Intervention, by Condition*

| Condition | Variable                 | Pre  |      |      |      | Post |      |      |      |
|-----------|--------------------------|------|------|------|------|------|------|------|------|
|           |                          | Min  | Max  | M    | SD   | Min  | Max  | M    | SD   |
| MBSR      | Trait mindfulness        | 1.53 | 4.60 | 3.28 | 0.73 | 2.27 | 4.93 | 3.49 | 0.64 |
|           | Psychological resilience | 1.00 | 5.00 | 3.63 | 0.84 | 2.50 | 5.00 | 3.84 | 0.78 |
|           | Cognitive reappraisal    | 2.33 | 7.00 | 4.86 | 1.32 | 2.67 | 7.00 | 5.17 | 1.05 |
|           | Expressive suppression   | 1.00 | 7.00 | 3.51 | 1.67 | 1.33 | 7.00 | 3.66 | 1.61 |
| HEP       | Trait mindfulness        | 1.27 | 5.60 | 3.62 | 1.11 | 1.33 | 5.33 | 3.54 | 1.06 |
|           | Psychological resilience | 3.00 | 5.00 | 4.07 | 0.58 | 2.50 | 5.00 | 4.16 | 0.76 |
|           | Cognitive reappraisal    | 1.33 | 7.00 | 5.30 | 1.25 | 1.33 | 7.00 | 5.43 | 1.17 |
|           | Expressive suppression   | 1.00 | 7.00 | 3.67 | 1.61 | 1.33 | 7.00 | 3.71 | 1.72 |

*Note.* MBSR  $n = 31$ ; HEP  $n = 29$ . Min = minimum score in the subgroup; Max = maximum score in the subgroup. Scores represent the mean of relevant items on each (sub)scale. MAAS range 1—6; CD-RISC-2 range 1—5; ERQ-S subscales (cognitive reappraisal: items 1,3,5; expressive suppression: items 2, 4, 6) range 1—7.

## Correlations

At baseline, only psychological resilience and cognitive reappraisal were significantly correlated,  $r(58) = .377, p = .003$ : participants with higher baseline resilience also reported more frequent use of cognitive reappraisal, consistent with theoretical accounts that treat resilience as a resource supporting adaptive reappraisal-based emotional functioning (Polizzi

& Lynn, 2021; Troy et al., 2023). Psychological resilience was not significantly correlated with expressive suppression,  $r(58) = .160, p = .222$ , in line with evidence that suppression is a less adaptive strategy whose use is only weakly linked to resilience resources (Gross & John, 2003; Aldao, 2013). Trait mindfulness was not significantly correlated with psychological resilience,  $r(58) = -.091, p = .488$ , with cognitive reappraisal,  $r(58) = .071, p = .588$ , or with expressive suppression,  $r(58) = -.122, p = .352$ . The two emotion regulation subscales were themselves unrelated,  $r(58) = -.075, p = .571$ , supporting the analytic decision to treat cognitive reappraisal and expressive suppression as separate outcomes. An overview of these relationships is provided in Table 3.

**Table 3**

*Correlations Among Pre-Intervention Variables in the Overall Sample*

| Variable                    | 1     | 2      | 3     | 4 |
|-----------------------------|-------|--------|-------|---|
| 1. Trait mindfulness        | —     |        |       |   |
| 2. Psychological Resilience | -.091 | —      |       |   |
| 3. Cognitive reappraisal    | .071  | .377** | —     |   |
| 4. Expressive suppression   | -.122 | .160   | -.075 | — |

*Note.*  $N = 60$ . \*\* $p < .01$ .

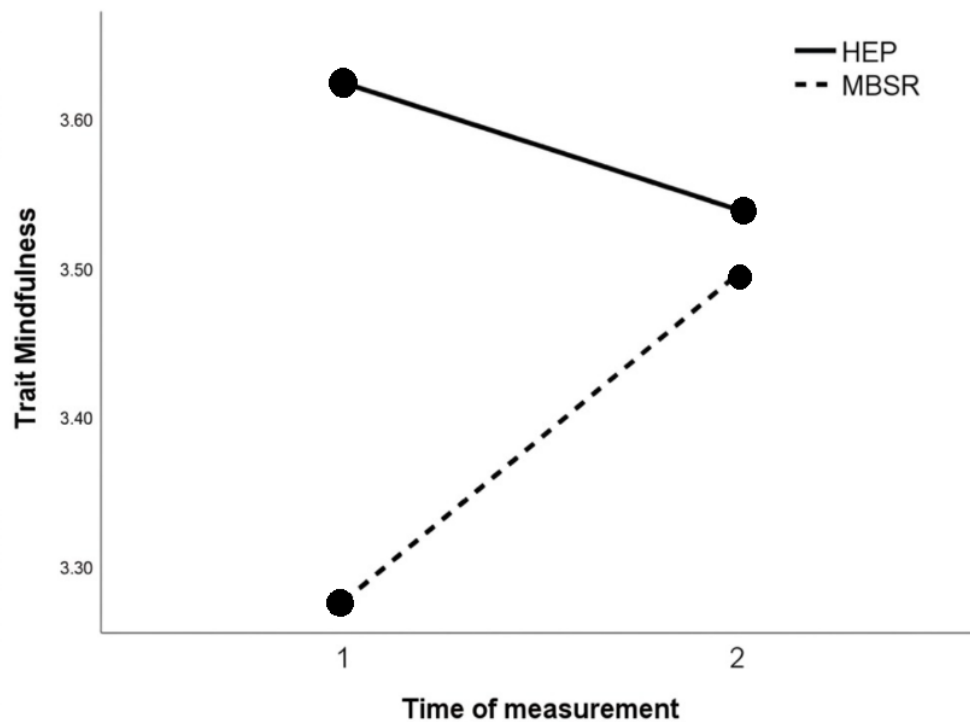
### Manipulation Check

To verify whether the mindfulness training produced a larger increase in trait mindfulness than the active control, a 2 (Time: pre, post; within-subjects)  $\times$  2 (Condition: MBSR, HEP; between-subjects) mixed-design ANOVA was conducted on trait mindfulness scores. The main effect of Time was not significant,  $F(1, 58) = 0.51, p = .476, \eta_p^2 = .009$ , indicating that trait mindfulness did not change significantly across the sample as a whole.

The main effect of Condition was also not significant,  $F(1, 58) = 0.87, p = .354, \eta_p^2 = .015$ , indicating that on average the two groups did not differ in trait mindfulness across the study period. Critically, the Time  $\times$  Condition interaction, the test of whether MBSR produced a larger pre-to-post increase in trait mindfulness than HEP, was also not significant,  $F(1, 58) = 2.28, p = .136, \eta_p^2 = .038$ . The pattern of means was nonetheless in the predicted direction: MBSR participants showed a numerical increase ( $M_{\text{pre}} = 3.28, M_{\text{post}} = 3.49$ ) whereas HEP participants showed a slight numerical decrease ( $M_{\text{pre}} = 3.62, M_{\text{post}} = 3.54$ ). The manipulation therefore did not produce a statistically significant differential change in self-reported mindfulness; null effects on the downstream outcomes must be interpreted with this in mind. The pattern is illustrated in Figure 2.

**Figure 2**

*Trait Mindfulness Pre and Post Intervention by Condition*

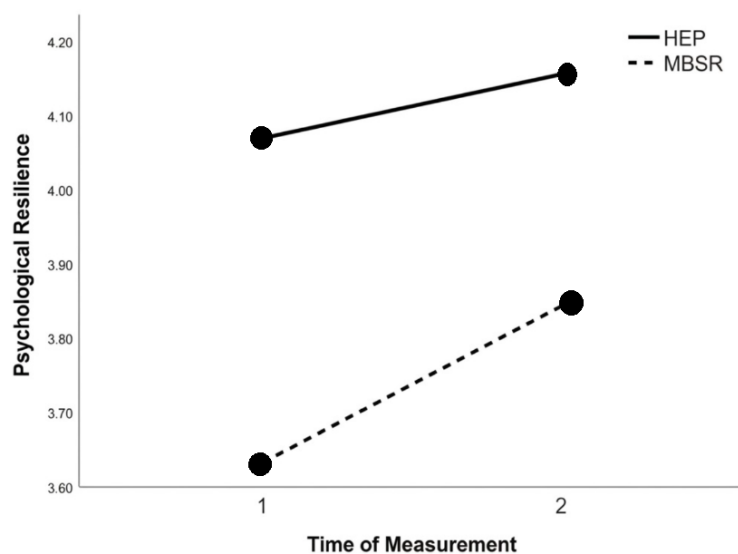


## ANOVA Results

*Psychological resilience.* A 2 (Time: pre, post)  $\times$  2 (Condition: MBSR, HEP) mixed-design ANOVA was conducted on psychological resilience scores. The Time  $\times$  Condition interaction, the central test of a differential intervention effect, was not significant,  $F(1, 58) = 0.34, p = .559, \eta_p^2 = .006$ : the MBSR group did not show a larger pre-to-post increase in psychological resilience than the HEP group, and both groups increased only modestly from pre to post. The main effect of Time was not significant,  $F(1, 58) = 2.04, p = .159, \eta_p^2 = .034$ . The main effect of Condition was significant,  $F(1, 58) = 5.48, p = .023, \eta_p^2 = .086$ , but as reported in the descriptive statistics above this difference was already present at pre-intervention and persisted unchanged at post-intervention; it therefore reflects a pre-existing baseline imbalance rather than a differential effect of the training. The mindfulness training therefore did not produce a larger gain in psychological resilience than the active control. The pattern of group means over time is shown in Figure 3.

**Figure 3**

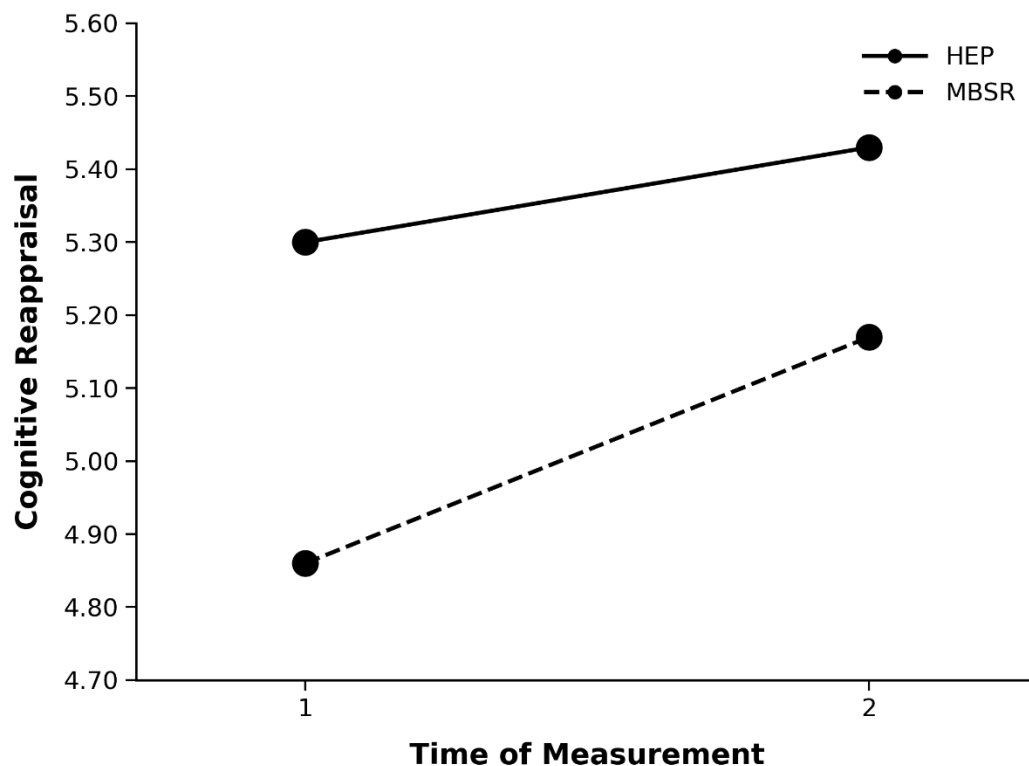
*Psychological Resilience Pre and Post Intervention by Condition*



*Cognitive reappraisal.* A 2 (Time: pre, post)  $\times$  2 (Condition: MBSR, HEP) mixed-design ANOVA on cognitive reappraisal scores yielded a non-significant Time  $\times$  Condition interaction,  $F(1, 58) = 0.40, p = .530, \eta_p^2 = .007$ : the MBSR group did not show a larger pre-to-post increase in cognitive reappraisal than the HEP group. The main effect of Time was not significant,  $F(1, 58) = 2.30, p = .135, \eta_p^2 = .038$ , and the main effect of Condition was not significant,  $F(1, 58) = 1.60, p = .212, \eta_p^2 = .027$ . Both groups showed only a small numerical increase in cognitive reappraisal from pre to post (MBSR: +0.31; HEP: +0.13), and the groups did not differ on average. The pattern of group means over time is shown in Figure 4.

**Figure 4**

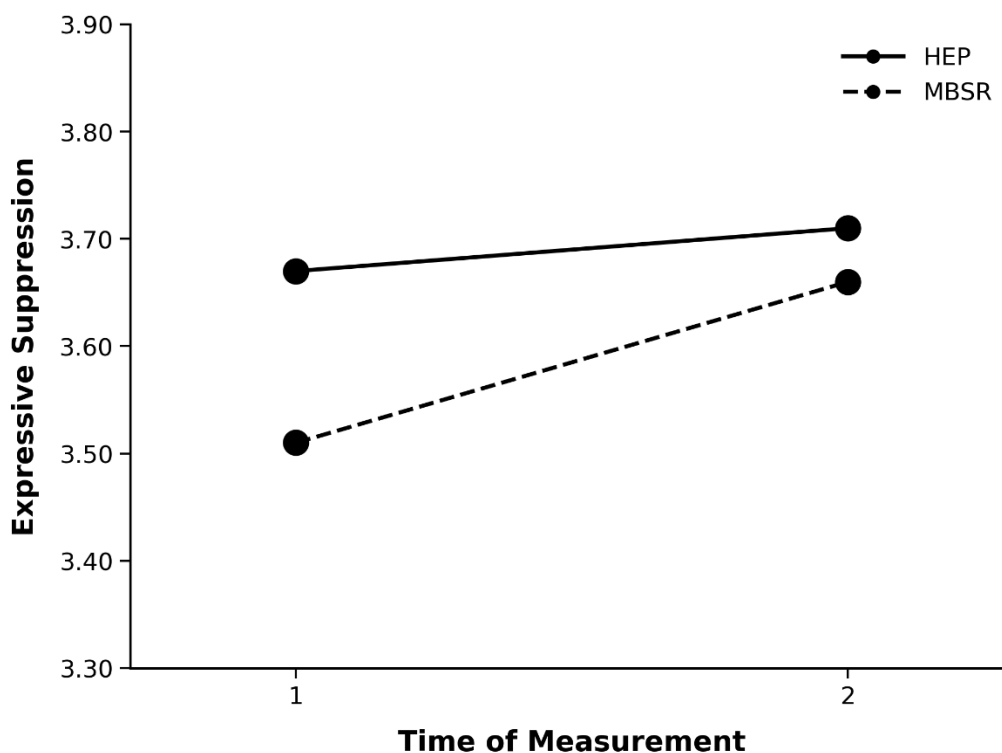
*Cognitive Reappraisal Pre and Post Intervention by Condition*



*Expressive suppression.* The parallel 2 (Time: pre, post)  $\times$  2 (Condition: MBSR, HEP) mixed-design ANOVA on expressive suppression scores also yielded a non-significant Time  $\times$  Condition interaction,  $F(1, 58) = 0.10, p = .750, \eta_p^2 = .002$ . Neither the main effect of Time,  $F(1, 58) = 0.37, p = .543, \eta_p^2 = .006$ , nor the main effect of Condition,  $F(1, 58) = 0.08, p = .783, \eta_p^2 = .001$ , reached significance. Both groups showed only a marginal numerical increase in expressive suppression from pre to post (MBSR: +0.15; HEP: +0.04), and the groups did not differ on average. The mindfulness training therefore did not produce a differential change in either emotion regulation subscale relative to the active control. The pattern of group means over time is shown in Figure 5.

**Figure 5**

*Expressive Suppression Pre and Post Intervention by Condition*



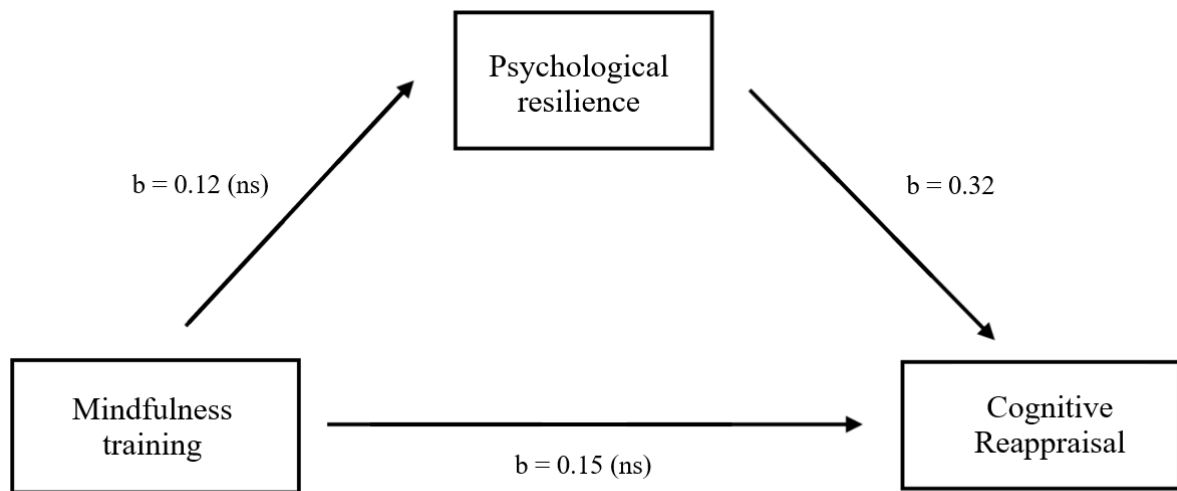
## Mediation Analysis

Two simple mediation models were fitted with the PROCESS macro for SPSS (Hayes, 2017, 2022; Model 4) and 5,000 bootstrap resamples, with Condition (0 = HEP, 1 = MBSR) as the independent variable and change in psychological resilience as the mediator. The first model tested whether change in psychological resilience mediated the effect of mindfulness training on change in cognitive reappraisal; the second tested the same mediator on change in expressive suppression.

The first mediation model tested whether change in psychological resilience mediated the relationship between mindfulness training and change in cognitive reappraisal (see Figure 6). Mindfulness training did not significantly predict change in psychological resilience ( $b = 0.12$ , 95% CI [-0.30, 0.54],  $t(58) = 0.59$ ,  $p = .559$ ). Change in psychological resilience, in turn, did not significantly predict change in cognitive reappraisal while controlling for training, although the relationship was in the predicted positive direction and approached significance ( $b = 0.32$ , 95% CI [-0.04, 0.68],  $t(57) = 1.78$ ,  $p = .080$ ), suggesting that participants whose resilience increased over the intervention also tended to increase their use of cognitive reappraisal. Mindfulness training did not remain a significant predictor of change in cognitive reappraisal once psychological resilience was accounted for ( $b = 0.15$ , 95% CI [-0.43, 0.72],  $t(57) = 0.50$ ,  $p = .616$ ). The total effect of mindfulness training on change in cognitive reappraisal was also not significant ( $b = 0.19$ , 95% CI [-0.40, 0.77],  $t(58) = 0.63$ ,  $p = .530$ ), and the indirect effect through psychological resilience was not significant ( $b = 0.04$ , 95% bootstrap CI [-0.12, 0.19]), indicating no mediation, although the marginal mediator-to-outcome path leaves open the possibility that resilience and reappraisal change in concert.

**Figure 6**

*Mediation Model: Effect of Mindfulness Training on Cognitive Reappraisal Through Psychological Resilience*

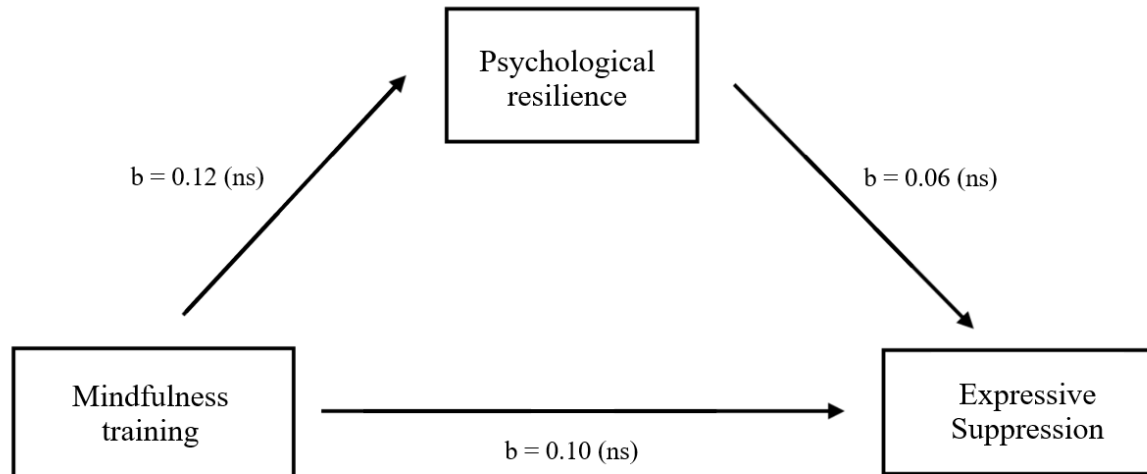


*Note.* Values represent unstandardized regression coefficients. \* $p < .05$ ; ns = non-significant.

The second mediation model tested whether change in psychological resilience mediated the relationship between mindfulness training and change in expressive suppression (see Figure 7). As in the first model, mindfulness training did not significantly predict change in psychological resilience ( $b = 0.12$ , 95% CI [-0.30, 0.54],  $t(58) = 0.59$ ,  $p = .559$ ). Change in psychological resilience, in turn, did not significantly predict change in expressive suppression while controlling for training ( $b = 0.06$ , 95% CI [-0.35, 0.47],  $t(57) = 0.28$ ,  $p = .778$ ); resilience and suppression were essentially uncoupled over the intervention. Mindfulness training did not remain a significant predictor of change in expressive suppression once psychological resilience was accounted for ( $b = 0.10$ , 95% CI [-0.57, 0.76],  $t(57) = 0.29$ ,  $p = .770$ ). The total effect of mindfulness training on change in expressive suppression was not significant ( $b = 0.11$ , 95% CI [-0.55, 0.76],  $t(58) = 0.32$ ,  $p = .750$ ), and the indirect effect through psychological resilience was not significant ( $b = 0.01$ , 95% bootstrap CI [-0.05, 0.11]), indicating no mediation.

**Figure 7**

*Mediation Model: Effect of Mindfulness Training on Expressive Suppression Through Psychological Resilience*



## Discussion

The present study examined whether psychological resilience mediates the relationship between mindfulness training and emotion regulation in young adults. Using a randomized experimental design with an active control condition (HEP; MacCoon et al., 2009), four hypotheses were identified and tested, derived from the view that mindfulness training improves emotion regulation in part by strengthening resilience (Hayes & Feldman, 2004; Shapiro et al., 2006). None of the primary hypotheses was fully supported. Mindfulness training did not produce significantly greater pre-to-post gains than the active control on psychological resilience (H1), and it did not produce significantly greater gains on either emotion regulation strategy, cognitive reappraisal or expressive suppression (H2). The two simple mediation models tested in the full sample (H3 and H4) showed no significant indirect effect of training on either emotion regulation subscale through change in psychological resilience; the path linking change in psychological resilience to change in

cognitive reappraisal was in the predicted positive direction but did not reach significance. Crucially, the manipulation check did not show a significantly larger increase in trait mindfulness in the MBSR group than in the HEP group. This is important context for the other null findings: because the intervention did not measurably increase the construct it was designed to target, the absence of downstream effects on resilience and emotion regulation is consistent with that primary null, rather than indicating that the proposed mechanism is itself absent.

The absence of significant differences between groups on psychological resilience, cognitive reappraisal, and expressive suppression aligns less well with prior reports that mindfulness-based interventions can strengthen resilience (Nemati et al., 2023; Pidgeon & Pickett, 2017) and reappraisal-based emotion regulation (Grossman et al., 2004; Hofmann et al., 2010; Keng et al., 2011). Several design considerations of the present study are relevant for interpreting this divergence, but their explanatory weight should not be overstated. Both groups showed only small numerical increases on the outcome measures from pre to post, so the choice of an active rather than passive control cannot, by itself, account for the absence of an MBSR-specific advantage. The intervention's six-week duration was shorter than the traditional eight-week MBSR protocol (Kabat-Zinn, 1982), but meta-analytic evidence indicates that shorter programmes can produce reliable effects in healthy samples, albeit with smaller and more variable effect sizes (Carmody & Baer, 2009; Khoury et al., 2015). The more direct candidate explanation is the unsuccessful manipulation check: the MBSR group did not show a significantly larger increase in self-reported trait mindfulness than the HEP group. Without evidence that the intervention measurably increased the construct it was designed to target, the proposed pathway (mindfulness → resilience → emotion regulation) cannot be evaluated as such, because its first step is not documented in these data. The small

sample size ( $N = 60$ , below the *a priori* target of 68) and the consequent limited statistical power further constrain the strength of inference that can be drawn from these null results.

Beyond the group-level training effects, the mediation models examined whether change in psychological resilience predicted change in either emotion regulation strategy across the full sample. The path linking change in resilience to change in cognitive reappraisal was in the predicted positive direction and approached but did not reach significance ( $b = 0.32, p = .080$ ), suggesting that participants whose resilience increased over the intervention also tended to increase their use of cognitive reappraisal. The same path for expressive suppression was effectively flat ( $b = 0.06, p = .778$ ), indicating that change in psychological resilience was unrelated to change in suppression. This pattern mirrors the baseline correlations reported in the Results section, where psychological resilience was significantly correlated with cognitive reappraisal but not with expressive suppression. It is consistent with the broader view that resilience functions primarily as a resource for adaptive, antecedent-focused regulation strategies such as reappraisal, rather than for response-focused strategies such as suppression (Gross & John, 2003; Polizzi & Lynn, 2021; Troy et al., 2023). Because the relevant path did not reach conventional significance, however, this should be treated as a direction for future, adequately powered work rather than as a confirmed mechanism in the present sample.

The non-significant indirect effects in both mediation models are anchored by the non-significant path linking training to change in psychological resilience. With the training producing no differential gain in the mediator, there was no training effect for resilience to carry forward to either reappraisal or suppression. Bootstrap methods can in principle detect a significant indirect effect even when the predictor-to-mediator path is non-significant (Hayes, 2017, 2022), so the null result here reflects the small magnitude of the indirect effects rather than a methodological limitation of the test. This convergence is consistent with Abedini et al.

(2021), who likewise found no evidence that emotion regulation mediated the mindfulness–resilience relationship in a clinical sample, and it tempers the more optimistic finding of Wang et al. (2016) that emotional (rather than psychological) resilience mediated the mindfulness–emotion regulation association in a cross-sectional, non-experimental design. Read alongside the broader literature (Desrosiers et al., 2013), the present result supports the view that the mindfulness–resilience–emotion regulation pathway is sensitive to study design, sample characteristics, intervention dose, and operationalization, rather than a uniformly robust causal chain.

By situating psychological resilience, rather than the narrower construct of emotional resilience examined by Wang et al. (2016), within an experimental rather than cross-sectional design, the present study contributes to a still-sparse evidence base on whether resilience is a causal mechanism or merely a correlate of mindfulness-based improvements in emotion regulation. The contribution is not that the theorized mediation was confirmed; it is that a well-specified test against an active control, using the psychometrically stricter conception of resilience described by Fletcher and Sarkar (2013), did not detect the pattern that less stringent designs have tended to show. That result is still helpful because it sets a clear limit: any theoretical model claiming that six weeks of MBSR reliably uplifts resilience enough to carry forward into measurable emotion regulation gains should either be revised or tested under conditions more favourable than those used here.

The sample consisted of healthy young-adult university students (Campbell-Sills et al., 2006; Zolkoski & Bullock, 2012), a group that tends to report relatively high baseline resilience, consistent with the observed sample mean above the scale midpoint, leaving less room for intervention-driven gains than would be available in a more distressed population (Troy et al., 2023). Voluntary enrolment, course credit, and self-selection may also have concentrated participants already disposed toward well-being behaviours, further narrowing

the ceiling. Finally, although random assignment was used, the two groups were not equivalent at baseline on resilience; a design that stratifies on baseline resilience, or an ANCOVA adjustment for pre-intervention scores, would handle this more cleanly.

## Limitations

Several limitations of the present study deserve consideration. First, despite random assignment, the two groups were not equivalent at baseline on psychological resilience: the HEP group reported higher pre-intervention scores than the MBSR group ( $t(58) = 2.35, p = .022$ , Cohen's  $d = 0.61$ ;  $M = 4.07$  vs  $M = 3.63$ ), a difference that persisted at post-intervention and produced the significant main effect of Condition in the ANOVA on psychological resilience. This pre-existing difference does not reflect an effect of the intervention and constrains the interpretation of the resilience result; it also reduces sensitivity to detect a differential increase in resilience over time in the MBSR condition, because the HEP group started closer to the upper end of the scale. Future studies of similar size would benefit from stratified random assignment on baseline resilience, or from analyses that statistically adjust for baseline differences, to mitigate this issue. Second, the final sample of 60 participants was modestly below the 68 indicated by the *a priori* power analysis ( $f^2 = 0.15$ , 80% power,  $\alpha = .05$ ), so the analyses were slightly underpowered to detect a medium-sized effect and would have had correspondingly less sensitivity to detect small indirect effects in the mediation models. Third, the manipulation check did not show that MBSR produced a significantly larger increase in trait mindfulness than HEP; without evidence that the intended training target was measurably altered, the null effects on downstream constructs are difficult to interpret as evidence about the underlying theoretical pathway. Fourth, the intervention's six-week duration may have been insufficient to produce reliable change in trait-level constructs, although the evidence on shorter mindfulness programmes is mixed: some reviews report reliable effects with as little as four to six weeks of practice in healthy samples (Carmody &

Baer, 2009; Khoury et al., 2015), while others suggest that longer durations produce more robust effects. Fifth, psychological resilience was assessed with the CD-RISC-2, a two-item instrument that, although attractive for feasibility, has limited sensitivity to detect modest within-person change and does not permit facet-level analysis. Fuller variants would offer broader content coverage and likely greater sensitivity: the CD-RISC-10 (Campbell-Sills & Stein, 2007) captures a unidimensional notion of hardiness across ten items, including adaptability, persistence, and tolerance of negative affect, while the CD-RISC-25 (Connor & Davidson, 2003) measures a five-factor structure spanning personal competence, trust of one's instincts, positive acceptance of change, control, and spiritual influences. Either of these instruments would likely detect smaller pre-to-post changes that the two-item form cannot resolve. Finally, all three primary outcomes were assessed by brief self-report questionnaires, which are subject to demand characteristics and common-method variance.

### **Future Research**

These results suggest several productive directions for future work. Replications with a larger sample stratified on baseline resilience, and with the full eight-week MBSR protocol (Kabat-Zinn, 1982), would address the most important design constraints in the present study simultaneously. Using a fuller resilience instrument (CD-RISC-10 or CD-RISC-25; Campbell-Sills & Stein, 2007; Connor & Davidson, 2003) would increase sensitivity to modest within-person change and allow facet-level analyses that the CD-RISC-2 precludes. Moderation analyses, for example, whether baseline psychological distress or trait emotion regulation moderates who benefits from MBSR, would speak directly to the heterogeneity in mindfulness effects documented across populations (Desrosiers et al., 2013; Keng et al., 2011) and would align this line of work with the affect-regulation framework proposed by Troy et al. (2023). Finally, integrated mindfulness-plus-resilience programmes of the sort evaluated by Nemati et al. (2023) may be a more promising intervention target than

mindfulness alone when the goal is to produce changes that propagate through resilience to emotion regulation.

### **Practical Implications**

The practical implications of the present study are modest. The mindfulness training did not produce significantly greater gains than the active control on trait mindfulness, psychological resilience, cognitive reappraisal, or expressive suppression, so the study does not provide new evidence that a six-week MBSR protocol reliably strengthens psychological resilience or emotion regulation in healthy young adults. This null result should not be read as evidence that mindfulness training is ineffective. Converging evidence indicates that mindfulness-based programmes reliably benefit well-being in chronically stressed populations such as healthcare workers (Cohen et al., 2022; Jiménez-Picón et al., 2021), and integrated programmes that combine mindfulness with explicit resilience or reappraisal training (Cullen & Pons, 2015; Tabibnia & Radecki, 2018) may be more effective than mindfulness alone when both resilience-building and emotion regulation are the targeted outcomes. Practitioners may therefore be best served by matching the intensity and content of the intervention to the presenting need of the population, rather than expecting a brief mindfulness training to produce reliable gains in less distressed populations.

### **Conclusion**

In summary, the present study did not find evidence that psychological resilience mediates the effect of a six-week mindfulness training on emotion regulation in young adults, when benchmarked against an active Health Enhancement Program control. At the same time, the positive baseline association between psychological resilience and cognitive reappraisal, together with the borderline coupling of change in resilience with change in reappraisal (but not with change in suppression), points toward a reappraisal-specific pathway that warrants testing under more favourable conditions (Garland et al., 2015; Troy et al., 2023), and the

methodological refinements identified here together point toward productive conditions under which the theorized mechanism should be tested more definitively. Understanding when, for whom, and over what timescale mindfulness-based training leverages resilience to improve emotion regulation remains a manageable and clinically meaningful question, and one that the present findings help to sharpen.

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