BRIEF REPORT

A Pilot Study of a Mindfulness Intervention for Adolescents and the Potential Role of Self-Compassion in Reducing Stress

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Objective: In this pilot study, we sought to investigate the effects of a mindfulness intervention for adolescents on a community sample of teens. Specifically, we explored the effects of mindfulness training on emotional well-being outcomes. Also, we examined the relationship between mindfulness and self-compassion at baseline-predicted outcome measures.

Design: This design was a pre-/post-pilot intervention study. Paired *t*-tests were conducted to examine change in outcome measures before and after the mindfulness intervention. Multiple regression was also conducted to investigate the influence of baseline mindfulness and self-compassion on outcome measures.

Setting: The study took place after school in a classroom at a local university.

Participants: Overall 28 adolescents age 10–18 years from two different cohorts participated in this study.

Intervention: Learning to BREATHE, a mindfulness curriculum designed specifically for adolescents and taught in six 1.5 h sessions, was implemented.

Main Outcome Measures: The outcome measures, life satisfaction and perceived stress, were included in an online survey before and after the mindfulness intervention.

Results: Results indicated that mindfulness, self-compassion, perceived stress, and life satisfaction improved from pre-intervention to post-intervention. Further, self-compassion (taught within the mindfulness intervention) was negatively related to perceived stress post-intervention while controlling for baseline stress. These findings suggest that mindfulness may be an effective intervention for improving indicators of emotional well-being among an adolescent population. Additionally, self-compassion may be a pathway through which youth can lower stress. Future research should examine self-compassion as a potential factor in promoting emotional well-being.

Key words: Mindfulness, Self-Compassion, adolescence, stress

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Adolescence is a developmental period often marked by significant psychological and emotional challenges. These challenges may interfere with developmental processes, leading to an increased risk for maladaptive behaviors, including substance abuse, violence, and poor school performance.[1] In 2012, 9.1% of all 12−17-year olds in the U.S. endured a major depressive episode, indicating a significant increase since 2008.[2] Most notably, the prevalence of suicide-related behaviors in U.S. 9−12th graders has increased in 2009−2011, with 15.8% of teens having contemplated suicide in the year prior to the survey.[3] Further, up to 32% of adolescents in the U.S. experience an anxiety disorder,[4] which has been linked to teenage alcohol dependency[5] and substance abuse.[6] Clearly, protective measures at this critical developmental stage can enhance mental health and behavioral functioning, potentially establishing a positive life trajectory.

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In adolescents, mindfulness, defined as paying attention to the present moment with nonjudgmental awareness,[7] has been shown to have significant positive associations with emotional well-being. A meta-analysis of 20 mindfulness-based intervention studies with youth reported an overall small to moderate effect size over active control comparisons for all outcomes (e.g., psychological symptoms, attention, and social functioning). Further, these interventions were most effective when addressing outcomes of psychopathology, and the effect size was larger in studies that used clinical samples.[8] These preliminary results suggest that mindfulness-based interventions for adolescent populations may be helpful in lessening stress and depression and increasing life satisfaction.

Self-compassion refers to holding one's suffering and pain with warmth, connection, and concern, and as such, it can be understood as turning compassion inward toward oneself.[9] Meta-analytic results with adults demonstrate a large effect size between greater self-compassion and lower psychopathology (i.e., depression, anxiety, and stress), suggesting that self-compassion is an important variable to consider in understanding mental health and resilience.[10] Research has shown a strong association between mindfulness and self-compassion, and mindfulness interventions frequently result in increased

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self-compassion in adults.[11] Although there has been minimal research on self-compassion in adolescents, two correlational studies have shown a positive association between self-compassion and well-being among adolescents.[9,12]

The aim of this pilot study was twofold: (1) to investigate the effect sizes of changes in mindfulness, self-compassion, and emotional well-being as a result of a mindfulness intervention tailored for adolescents and (2) to determine if self-compassion or mindfulness at baseline will predict well-being outcomes post-intervention.

METHODS

The sample comprised participants from two different cohorts who took a mindfulness course several months apart. Registrants of a teen mindfulness class offered through the University of North Carolina, Chapel Hill Program on Integrative Medicine (UNC-CH PIM) comprised one of the cohorts ($n = 13$); the other cohort ($n = 15$) consisted of participants of a research study at UNC-CH PIM on mindfulness and adolescents that was funded by a Francisco J. Varela Award provided to the first author from the Mind and Life Foundation. Further results of the latter research study will be discussed in a forthcoming article. Both studies were approved by the University of North Carolina, Chapel Hill Institutional Review Board. All participants in this uncontrolled pilot study were administered the online survey before and after the intervention. Females comprised 57% of the sample and males comprised 43%; 79% were Caucasian, and all participants were between age ten and 18 years. In all, 64% of the mothers and 61% of the fathers of the adolescents had graduate degrees, and all had graduated at least high school.

The mindfulness intervention that was implemented was *Learning to BREATHE: A Mindfulness Curriculum for Adolescents*.[13] Based on Mindfulness-Based Stress Reduction,[7] *Learning to BREATHE* is adapted for an adolescent population. It is constructed around six themes, each of which focuses on a different way of developing mindfulness: body, thoughts, emotions, attention, loving kindness, and healthy habits. It was led by the first author, an experienced mindfulness practitioner and teacher. Participants met weekly for 1.5 h over a six-week period.

MEASURES

Mindfulness is measured by the Children and Adolescent Mindfulness Measure (CAMM).[14] This measure assesses both attention in the moment and acceptance of one's internal experiences. Reported Cronbach's α is .82.[14] Construct validity was established through positive associations with quality of life, academic proficiency, and social skills and negative correlations with somatic ailments and behavior problems.[14] Self-compassion is measured by the Self-Compassion Scale-short form (SCS). Reported reliabilities are greater than .86.[15] Emotional well-being is assessed through two constructs: life satisfaction and perceived stress. Life satisfaction is measured by the Student Life Satisfaction Scale (SLSS).[16] This scale assesses global life satisfaction, which is a component of subjective well-being, and refers to a broad-stroke judgment about one's overall happiness. Reported reliabilities are greater than .82.[16–18] Concurrent validity is reported through convergence with parent reports[17–18] and teacher reports.[19] The Perceived Stress Scale (PSS)[20] is a well-established scale that assesses the degree to which respondents find their lives "unpredictable, uncontrollable, and overloading."[20] Reliability has been reported as greater than .86[20–21] and content, predictive, and concurrent validities have been established.[20]

RESULTS

Means and standard deviations for all measures pre- and post-intervention are presented in Table 1. Correlations between all measures at pre- and post-intervention were measured and are presented in Table 2. At both baseline and post-intervention, mindfulness and self-compassion are significantly correlated and both are significantly inversely correlated with perceived stress. At baseline, both mindfulness and self-compassion are significantly correlated with life satisfaction; however, neither is significantly correlated with life satisfaction at post-intervention. Figure 1 depicts correlations among variables at baseline. Paired sample *t*-tests were conducted to determine effect sizes for changes from pre- to post-intervention. As expected, mindfulness, self-compassion, and life satisfaction increased from pre- to post-intervention, and perceived stress decreased. Hedges *g*, an effect size estimate recommended for use with small samples, was calculated (Table 1). To determine if changes in one variable were related to changes in another variable, change scores were created for all variables by subtracting the pre-score from the post-score. Pearson product correlations were then measured between all change scores. Results indicated that correlations were significant between change scores of mindfulness

Table 1. Descriptive Statistics, Paired *t*-tests, and Effect Size Estimates (Hedges g) for all Study Variables ($n = 28$)

Variable	Baseline		Post-Intervention		Paired *t*-Tests ($df = 27$)	Effect Size
	M	SD	*M*	SD	*t*-Value	Hedges *g*
CAMM	33.11	6.62	34.61	5.15	−1.29	0.24
SCS	2.85	0.73	3.16	0.80	−2.29*	0.40
PSS	28.32	7.57	25.39	9.23	1.56	0.34
SLSS	2.63	0.60	2.84	0.61	−1.85**	0.33

Note: CAMM, Children and Adolescent Mindfulness Measure; SCS, Self-compassion scale; PSS, Perceived Stress Scale; SLSS, Student Life Satisfaction Scale.
*$P < .05$.
**$P < .10$.

Table 2. Correlations Between Mindfulness (CAMM), Self-Compassion (SCS), Perceived Stress (PSS), and Life Satisfaction (SLSS) Pre- and Post-Intervention

	SCS Pre	PSS Pre	SLSS Pre	CAMM Post	SCS Post	PSS Post	SLSS Post
CAMM Pre	0.64**	−0.59**	0.65**	0.48*	0.23	−0.36	0.37
SCS Pre	1	−0.64**	0.55**	.40*	0.55**	−0.49**	0.31
PSS Pre		1	−0.65**	−0.28	−0.27	0.31	−0.48**
SLSS Pre			1	−0.03	−0.03	−0.10	0.52**
CAMM Post				1	0.50**	−0.54**	0.22
SCS Post					1	−0.73**	0.31
PSS Post						1	−0.59**

*$P < .05$.
**$P < .01$.

and self-compassion ($r = .54$, $P = .003$), mindfulness and life satisfaction ($r = .50$, $P = .006$), self-compassion and perceived stress ($r = -.55$, $P = .002$), self-compassion and life satisfaction ($r = .61$, $P = .002$), and life satisfaction and perceived stress ($r = -.59$, $P = .001$). Next, hierarchical regression was used to assess the influence of baseline self-compassion or mindfulness on perceived stress or life satisfaction post-intervention. Baseline mindfulness did not have a significant effect on any outcomes, but results indicate that baseline self-compassion predicted lower perceived stress at post-intervention while controlling for baseline perceived stress (Table 3).

DISCUSSION

Participants who took a mindfulness class demonstrated positive changes in emotional well-being, with effect sizes in the small to moderate range. Self-compassion had the largest effect size and was the only construct that demonstrated a statistically significant change from pre to post. Further, changes in mindfulness from pre- to post-intervention were related to changes in life satisfaction across the two time points but not to changes in perceived stress, and changes in self-compassion were related to both changes in life satisfaction and changes in perceived stress. Additionally, self-compassion at baseline-predicted perceived stress at post-intervention. In other words, the more self-compassionate participants were prior to the intervention, the less stress they perceived themselves as having after the intervention regardless of their perceived stress at baseline. These results are supported by findings of Breines et al.,[22] who found that baseline self-compassion served as a protective factor against an inflammatory reaction when exposed to a psychosocial stressor, and Arch et al.,[23] who reported that a self-compassion induction condition prior to a psychosocial stressor lowered the biological stress response. Taken together, this evidence supports self-compassion as a potential buffer that can protect individuals in contending with daily stress, and support them in achieving greater emotional well-being. More research needs to be done in this area to further support these findings.

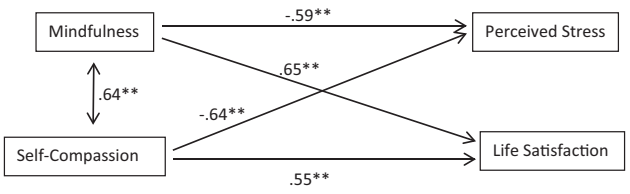

Figure 1. Correlations among variables at baseline, **$P < .01$.

This pilot study has several limitations. First, without a control group we cannot determine if results are due to the mindfulness intervention or another time-related variable. Second, the small sample size reduces our ability to generalize these findings. To confirm these results, future studies should include a control group and larger sample size.

Recognizing both the paucity of research on self-compassion in adolescents and the need to address the emotional challenges at this critical developmental stage, this study contributes to the literature by suggesting that cultivating self-compassion may provide a pathway through which adolescents can enhance their emotional well-being. For example, implications for practice include developing a program to nurture self-compassion in adolescents. This program could utilize mindfulness practices to bring awareness and acceptance to challenging experiences in the moment while at the same time actively engaging in self-soothing behaviors. Such a program has the potential to facilitate improved psychological states and ultimately promote more adaptive behavioral outcomes in teens.

Table 3. Hierarchical Regression with Baseline Self-Compassion on Perceived Stress (Post-Intervention) Controlling for Perceived Stress at Baseline

Variable	Step 1		Step 2	
	B (SE)	*β*	*B* (SE)	*β*
Step 1: PSS (pre)	0.38 (.23)	0.31	0.01 (.28)	0.01
Step 2: SCS (pre)			−6.08 (2.87)	−0.48*
R^2 Change	0.14			
F Change	4.50*			

*$P < .05$.

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