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An Examination of Mindfulness Skills in terms of Affect Tolerance among Individuals with Elevated Levels of Health Anxiety

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Abstract

Background and Objectives.—Affect tolerance factors, including anxiety sensitivity, intolerance of uncertainty, and emotional distress tolerance, have been implicated in the exacerbation of health anxiety. Therefore, identifying methods to improve affect tolerance in health anxious populations is imperative. Despite the link between mindfulness and greater affect tolerance in non-clinical populations, no work has examined the role of mindfulness skills in terms of affect tolerance among individuals with elevated health anxiety. The aim of the current study was to examine the unique contribution of mindfulness skills in terms of distress tolerance, anxiety sensitivity, and intolerance of uncertainty.

Methods.—Participants were 218 undergraduates with clinically-elevated levels of health anxiety (75.7% female; M_{age} = 19.53, SD = 3.16, Range = 18-45) who completed self-report measures for course credit.

Results.—Findings indicated that, after controlling for theoretically relevant covariates, greater acting with awareness, nonjudgment, and nonreactivity were uniquely associated with greater distress tolerance, and greater non-reactivity was associated with lower levels of intolerance of uncertainty. Though none of the mindfulness skills emerged as specific individual predictors of anxiety sensitivity, these skills collectively accounted for unique variance in anxiety sensitivity.

Conclusions.—These findings suggest that mindfulness skills may be helpful in targeting affect tolerance factors among individuals with elevated health anxiety.

Keywords

anxiety sensitivity; distress tolerance; health anxiety; intolerance of uncertainty; mindfulness

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Health anxiety is defined as a preoccupation with fears of having or acquiring an illness (Salkovskis, Rimes, Warwick, & Clark, 2002). Health anxiety results from maladaptive health-related beliefs (e.g., illness is likely, illness leads to death), which lead to increased interoceptive attention, appraisals of perceived sensations as a serious illness, and health-related worry (Abramowitz, Schwartz, & Whiteside, 2002; Warwick & Salkovskis, 1990). Individuals with elevated health anxiety may find these anxiety symptoms inherently frightening or misperceive them as further signs of physical illness, thus increasing overall anxiety levels. In an effort to reduce the anxiety and gain certainty about health status, these individuals engage in safety-seeking behaviors, such as visiting medical providers, obsessively checking their body, or searching health information on the internet (Abramowitz et al., 2002; Warwick & Salkovskis, 1990). Unfortunately, these behaviors negatively reinforce health anxiety and beliefs that health-related uncertainty cannot be tolerated (Olatunji, Etzel, Tomarken, Ciesielski & Deacon, 2011), creating a self-perpetuating cycle of health anxiety symptoms (Abramowitz, Deacon, & Valentiner, 2007). Left untreated, symptoms can become increasingly severe, leading to significant distress, functional impairment, and significant healthcare costs (Barsky, Ettner, Horsky, & Bates, 2001; Fink, Ørnbøl, & Christensen, 2010; Mykletun et al., 2009; Sunderland, Newby, & Andrews, 2013).

There are several cognitive-affective factors that play a role in maintaining the health anxiety cycle. These factors generally relate to an inability to tolerate distressing emotions in an adaptive way. One such factor is anxiety sensitivity, defined as the fear of anxiety-related events due to their perceived negative physical, social, or psychological consequences (McNally, 2002; Reiss & McNally, 1985; Taylor et al., 2007). High levels of anxiety sensitivity lead individuals to experience increased fear and anxiety in response to arousal-related sensations, leading to the amplification of health anxiety and creating further physical symptoms to be feared (Wheaton, Berman, Franklin, & Abramowitz, 2010). In addition, low distress tolerance (inability to tolerate emotional distress; Simons & Gaher, 2005) and intolerance of uncertainty (difficulty tolerating emotional reactions to perceived uncertainty; Carleton, 2016a; Carleton, 2016b) motivate individuals to engage in reassurance-seeking behaviors in order to alleviate anxiety and gain information that affords a temporary sense of certainty about their health. Indeed, extant research suggests that greater levels of health anxiety are associated with greater levels of anxiety sensitivity (Fergus & Bardeen, 2013; Olatunji et al., 2009; Wheaton, Berman, & Abramowitz, 2010; Wheaton et al., 2010), lower levels of distress tolerance (Fergus, Bardeen, & Orcutt, 2016), and higher levels of intolerance of uncertainty (Boelen & Carleton, 2012; Fergus & Bardeen, 2013; Fetzner et al., 2014). Thus, identifying intervention methods that could target these affect tolerance factors in order to interrupt the processes that underlie the health anxiety cycle is of particular importance.

Mindfulness may be one such approach to examine in this regard. Mindfulness is defined as paying attention non-judgmentally to the present moment (Kabat-Zinn, 1994) and, in clinical applications, is thought to consist of several skills that can be learned with practice. One of the most common skills-based models posits five specific mindfulness skills: (1) the ability to observe internal experiences (i.e., thoughts, emotions, body sensations) as they occur; (2) describe or label these experiences objectively; (3) act with awareness of present moment

activities (i.e., out of "automatic pilot); (4) suspend judgment of internal experiences; and (5) refrain from automatically reacting toward internal experiences (Baer et al., 2006). Greater levels of mindfulness are thought to help individuals with health anxiety notice emotional distress and physical sensations in an open and accepting way, preventing catastrophic misinterpretations of bodily sensations and minimizing the need for reassurance-seeking behaviors (Luberto, Magidson, & Blashill, 2017; Surawy, McManus, Muse, & Williams, 2015). Although mindfulness interventions have been shown to successfully decrease health anxiety (Eilenberg, Kronstrand, Fink, & Frostholm, 2013; Lovas & Barsky, 2010; McManus, Surawy, Muse, Vazquez-Montes, & Williams, 2012), there has been little exploration of the relationship between mindfulness and the affect tolerance factors that underlie health anxiety.

It is possible that mindfulness training targets the deficits in affect tolerance described above to ultimately reduce health anxiety. Indeed, cross-sectional work in non-health anxious samples indicates that higher levels of mindfulness are associated with greater distress tolerance, lower anxiety sensitivity, and a greater capacity for tolerating uncertainty (Brown, Bravo, Roos, & Pearson, 2015; Feldman, Dunn, Stemke, Bell, & Greeson, 2014; Kraemer, O'Bryan, & McLeish, 2016; Luberto, McLeish, Robertson, Avallone, Kraemer, & Jeffries, 2014; McKee, Zvolensky, Solomon, Bernstein, & Leen-Feldner, 2007). Moreover, intervention research suggests that mindfulness-based interventions successfully increase distress tolerance and reduce anxiety sensitivity in non-health anxious samples (Kim et al., 2010; Kraemer, Luberto, O'Bryan, Mysinger, & Cotton, 2016; Lotan, Tanay, & Bernstein, 2013; Tull, Schulzinger, Schmidt, Zvolensky, & Lejuez, 2007). Only one study, to date, has examined the interplay between mindfulness, affect tolerance, and health anxiety. Kraemer and colleagues (2016) found that mindfulness was associated with lower levels of health anxiety indirectly through decreased levels of intolerance of uncertainty. However, participants in the study had relatively low levels of health anxiety and only one affect tolerance factor was examined. Despite these promising findings, previous research has not examined the role of mindfulness skills in terms of multiple affect tolerance factors or studied these relationships in individuals with high health anxiety.

Therefore, the purpose of the current study was to examine whether specific mindfulness skills (i.e., observing, describing, acting with awareness, nonjudgment, and nonreactivity) are associated with affect tolerance factors central to the development and maintenance of health anxiety (i.e., distress tolerance, anxiety sensitivity, and intolerance of uncertainty) among individuals with clinically-elevated levels of health anxiety symptoms. Determining whether certain mindfulness skills differentially predict one affect tolerance factor relative to another could help clinicians better target the delivery of mindfulness-based interventions to patients' specific deficits, thereby optimizing treatment efficacy. It was hypothesized that, after controlling for the effects of gender, self-reported current and/or past diagnosed medical conditions, and negative affectivity, higher levels of observing would significantly predict greater affect tolerance problems, and higher levels of describing, acting with awareness, non-judgment, and non-reactivity would significantly predict fewer affect tolerance problems. The observing skill was hypothesized to have a negative effect given that it appears, outside of the context of other mindfulness skills or a history of meditation

training, to be associated with a tendency to observe events in a judgmental fashion (Baer, 2016; Baer et al., 2006; Gu et al., 2016; Luberto et al., 2014).

Method

Participants

Participants were 218 undergraduate students (75.7% female; M_{age} = 19.61, SD = 3.27, Range = 18–45) with clinically-elevated levels of health anxiety, as determined by score of 18 or higher on the Short Health Anxiety Inventory (SHAI; Rode, Salkovskis, Dowd & Hanna, 2006; Salkovskis et al., 2002). The current sample reflects a subset of a larger sample (N = 998) of undergraduate students in Introductory Psychology courses participating in a study on college student health for course credit. In terms of racial composition of the sample, 83.0% self-identified as Caucasian, 5.5% as African American, 4.6% as Asian, 4.6% as Multiracial, 0.5% as American Indian or Alaska Native, and 1.8% did not specify. 2.8% reported Hispanic ethnicity.

Measures

Demographics Questionnaire.—Participants were asked to provide general demographic information (e.g., gender, age, race) as well as to indicate whether they have ever (either currently or in the past) been diagnosed by a physician with any of the following medical problems: frequent or severe headaches (20.2%), asthma (20.8%), chronic lung disease (1.4%), back or neck problems (25.0%), chronic pain (9.6%), kidney problems (2.8%), ulcers (3.7%), arthritis/rheumatism (4.1%), epilepsy/seizures (1.4%), cancer (1.8%), heart disease (.9%), high blood pressure (2.8%), and diabetes (.9%). On average, participants had 1.24 (SD = 1.26) of these chronic medical conditions.

Short Health Anxiety Inventory (SHAI).—The SHAI (Salkovskis et al., 2002) is an 18-item self-report measure that assesses health anxiety related to one's physical health (e.g., "I spend most of my time worrying about my health"), awareness of bodily sensations (e.g., "I am constantly aware of bodily sensations of changes"), and perceived consequences of having an illness (e.g., If I had a serious illness I would be completely unable to enjoy my life at all"). Participants rate each item on a 4-point scale (ranging from 0 to 3) and ratings are summed, with higher scores indicating greater levels of health anxiety symptoms. A score of 18 on the SHAI has been shown to reliably discriminate individuals with severe levels of health anxiety (Rode, Salkovskis, Dowd & Hanna, 2006), and research has indicated that the SHAI is valid for use in medical populations (LeBouthillier, Thibodeau, Alberts, Hadjistavropoulos, & Asmundson, 2015). The SHAI was used in the current study to assess for the presence of severe health anxiety. Internal consistency for the current sample was adequate (α = .74).

Positive Affect Negative Affect Schedule (PANAS).—The PANAS (Watson, Clark & Tellegen, 1988) is a mood measure that is commonly used in psychopathology research (Watson, 2000). The PANAS consists of two global dimensions of affect: positive and negative. Only the negative affectivity subscale (PANAS-NA) was used in the current study to assess for a broad-based tendency to experience negative affective states. Ratings on all

10-items are sum scored, with higher scores indicating greater negative affect. The validity of the PANAS has been well-documented (Watson, 2000; Watson et al., 1988). Internal consistency for the PANAS-NA in the current sample was adequate (α = .82).

Distress Tolerance Scale (DTS).—The DTS (Simons & Gaher, 2005) is a 15-item self-report measure that assesses the ability to withstand negative emotional states (e.g., "Feeling distressed or upset is unbearable to me"). Respondents rate the degree to which each statement applies to them on a five-point Likert-type scale (1 = *strongly agree* to 5 = *strongly disagree*). Items are averaged to compute the total score, with higher scores indicating a greater ability to tolerate emotional distress. The DTS has demonstrated strong psychometric properties (Simons & Gaher, 2005). Internal consistency for the current sample was excellent (α = .91).

Anxiety Sensitivity Index-3 (ASI-3).—The ASI-3 (Taylor et al., 2007) is an 18-item self-report measure that assesses fear of arousal-related sensations. It consists of three subscales: physical concerns (e.g., "When I feel pain in my chest, I worry that I'm going to have a heart attack"), cognitive concerns (e.g., "It scares me when I'm unable to keep my mind on a task"), and social concerns (e.g., "It scares me when I blush in front of people"). Participants rate the degree to which each statement applies to them on a five-point Likert-type scale (0 = *very little* to 5 = *very much*), and ratings for each item are summed to yield the total score. The ASI-3 has demonstrated excellent psychometric properties (Taylor et al., 2007). Internal consistency for the ASI-3 in the current sample was good (α = .88).

Intolerance of Uncertainty Scale-Short Form (IUS-12).—The IUS-12 (Carleton, Norton & Asmundson, 2007) is a 12-item self-report measure that assesses an individual's ability to withstand uncertainty, ambiguity and future events, and one's cognitive and behavioral reactions to uncertainty. The IUS-12 was adapted from the original 27-item IUS (Buhr & Dugas, 2002), and has demonstrated a high correlation with the original version (r = .96; Carleton et al., 2007). Respondents rate the degree to which each statement is characteristic of them on a five-point Likert-type scale (1 = *not at all characteristic of me* to 5 = *entirely characteristic of me*), and items are sum scored. The total score was used in the current study to assess the global ability to tolerate uncertainty. The IUS-12 has demonstrated strong psychometric properties (Carleton et al., 2007). Internal consistency for the current sample was excellent (α = .91).

Five Facet Mindfulness Questionnaire (FFMQ)—The FFMQ (Baer et al., 2006) is a 39-item self-report measure that assesses an individual's ability to attend to the present moment. Participants rate on a five-point Likert Scale (1= *never or very rarely true* to 5 = v*ery often or always true*) how often they engage in five specific mindfulness skills: (1) Observe (e.g., "When I'm walking, I deliberately notice the sensations of my body moving"); (2) Describe (e.g., "I can easily put my beliefs, opinions, and expectations into words"); (3) Acting with Awareness (e.g., "I find it difficult to stay focused on what's happening in the present – Reversed scored); (4) Non-judgment (e.g., "I tell myself I shouldn't be feeling this way" – Reversed scored); and (5) Non-reactivity (e.g., "In difficult situations, I pause without immediately reacting"). Ratings for each item are summed to

calculate scores for each subscale, with higher scores reflecting greater use of each mindfulness skill. The FFMQ has demonstrated good psychometric properties (Baer et al., 2006, Baer et al., 2008). Internal consistency was adequate for the Observe (α = .72) and Non-reactivity (α = .73) subscales, and good for the Describe (α = .85), Acting with Awareness (α = .85), and Non-judgment (α = .88) subscales.

Procedure

Undergraduate students from psychology courses at a large Midwestern university who were over the age of 18 were eligible to participate in the study. Interested and eligible students were provided with a link to complete the online study measures at their convenience. Study data were collected and managed via REDCap (Research Electronic Data Capture; Harris et al., 2009), a secure, web-based application designed to support data management for research studies. In order to ensure anonymity of responses, information regarding participants' IP addresses were not collected. After participants submitted the online survey, they were contacted by a researcher and granted course credit. The Institutional Review Board approved all study materials and procedures prior to data collection. A waiver of consent was obtained and participants were presented with an Information Sheet online prior to completing study measures. Participants were required to check a box indicating that they read and understood the Information Sheet before proceeding with the study. All study procedures were approved by the University of Cincinnati Institutional Review Board.

Data Analytic Plan

All study variables were examined for the presence of missing data. Approximately 5% of data or less were missing for each study variable, indicating that listwise deletion would be an appropriate method for handling missing data (Tabachnick & Fidell, 2007); as such, results of all statistical tests are reflective of individuals who had adequate data for the specified analysis. No records were deleted as a result of data cleaning procedures.

First, bivariate correlations were conducted to examine the associations between all study variables. Next, hierarchical multiple regression (Cohen, Cohen, West & Aiken, 2003) was used to examine the unique predicative validity of mindfulness skills (i.e., observe, describe, acting with awareness, non-judgment, non-reactivity) in terms of each affect tolerance factor. Separate models were constructed for distress tolerance (DTS), anxiety sensitivity (ASI-3), and intolerance of uncertainty (IUS-12). In each model, gender, the presence of one or more medical conditions, and negative affectivity were entered simultaneously at step one. Covariates were chosen on an *a priori* basis given their relevance to health anxiety and affect tolerance (e.g., Abramowitz, Olatunji, & Deacon, 2007; Freeston, Rheaume, Letarte, Dugas, & Ladouceur, 1994; Jang, Stein, Taylor, & Livesley, 1998; MacSwain et al., 2009; McLeish, Luberto, & O'Bryan, 2015; O'Cleirigh, Ironson, & Smits, 2007; Roy-Byrne et al., 2008; Simons & Gaher, 2005). Specifically, we controlled for negative affect to more precisely estimate the relationship between mindfulness and affect tolerance, given that the general tendency to experience negative affect is related to the ability to tolerate affect (Simons & Gaher, 2005). At step two of the model, the five mindfulness skills were entered simultaneously in order to estimate the amount of variance accounted for by these variables.

Results

See Table 1 for bivariate correlations. Female gender was significantly correlated with poorer distress tolerance ($r = -.18$, $p = .008$). The presence of one or more medical conditions was significantly positively associated with observing ($r = .17$, $p = .013$). Negative affect was significantly positively correlated with anxiety sensitivity ($r = .41$, $p < .001$) and intolerance of uncertainty ($r = .42$, $p < .001$), and significantly negatively correlated with distress tolerance ($r = -.55$, $p < .001$). All of the mindfulness skills except observing were significantly positively correlated with distress tolerance (range: .29 to .57) and significantly negatively correlated with anxiety sensitivity (range: −.22 to −.37), intolerance of uncertainty (range: −.27 to −.37), and negative affect (range: −.20 to −.45). All mindfulness skills were significantly positively correlated with one another (range: .21 to .48) except observing, which was only correlated with describing ($r = .23$, $p = .001$), non-judgment ($r = -.25$, $p < .001$), and non-reactivity ($r = .25$, $p < .001$).

Results from regression analyses are presented in Table 2. In terms of distress tolerance, step one was significant and accounted for 31.7% of the variance. Gender ($\beta = -.14$, $t = -2.30$, $p = .023$) and negative affect ($\beta = -.53$, $t = -8.52$, $p < .001$) were the only significant predictors at this step. Step two was also significant, accounting for an additional 22.1% variance. At step two, higher levels of acting with awareness ($\beta = .15$, $t = 2.48$, $p = .014$), non-judgment ($\beta = .27$, $t = 4.14$, $p < .001$), and non-reactivity ($\beta = .29$, $t = 4.81$, $p < .001$) significantly predicted higher levels of distress tolerance. The association between greater levels of observing and lower levels of distress tolerance was trending ($\beta = -.10$, $t = -1.73$, $p = .085$).

For anxiety sensitivity, step one was significant and accounted for 19.2% of the variance. Negative affect was the only significant predictor at this step ($\beta = .43$, $t = 6.30$, $p < .001$). Step two was significant and accounted for an additional 6.5% of unique variance. Although none of the mindfulness skills were significant unique predictors of anxiety sensitivity, non-reactivity ($\beta = -.15$, $t = -1.92$, $p = .056$) approached significance.

Lastly, in terms of intolerance of uncertainty, step one was significant, accounting for 21.4% variance. Negative affect ($\beta = .45$, $t = 6.60$, $p < .001$) and medical status ($\beta = -.15$, $t = -2.18$, $p = .031$) were the only significant predictors at this step. Step two was also significant and accounted for 6.8% of unique variance. Non-reactivity was the only significant unique predictor at this step ($\beta = -.17$, $t = -2.18$, $p = .03$); however, describing ($\beta = -.13$, $t = -1.80$, $p = .073$) approached significance.

Discussion

The aim of the current study was to examine the associations between specific mindfulness skills and affect tolerance factors among individuals with clinically elevated levels of health anxiety. Results indicated that greater use of mindfulness as a collective set of skills was associated with greater distress tolerance and lower levels of anxiety sensitivity and intolerance of uncertainty. Moreover, as expected, when looking at the unique effects of individual mindfulness skills, greater awareness, nonjudgment, and nonreactivity was

associated with greater distress tolerance, and greater non-reactivity was uniquely associated with lower intolerance of uncertainty.

Present-focused awareness of experiences (i.e., acting with awareness) may help health anxious individuals tolerate anxious distress as it unfolds in response to a health threat because it disrupts negative repetitive thinking (i.e., worry; Borkovec, Alcaine, & Behar, 2004). Greater levels of nonjudgment may help these individuals better tolerate emotional distress in response to health cues by fostering acceptance of body sensations and the negative automatic appraisals that occur in response to them, thereby reducing motivations for safety-seeking behaviors (i.e., internal sensations no longer being judged as "dangerous"); however, future research would be needed in order to adequately test this theory. Relatedly, non-reactivity may provide health anxious individuals with the ability to refrain from immediately and automatically engaging in behavioral strategies to reduce distress, helping them learn, experientially, that distress is something they can tolerate. A similar interpretation may also apply to the significant association between greater non-reactivity and lower levels of intolerance of uncertainty; that is, non-reactivity may allow individuals to overcome automatic urges to engage in behaviors aimed at decreasing distress resulting from uncertainty about symptoms and health status.

Contrary to our hypothesis, however, describing was not a significant predictor of greater distress tolerance, lower anxiety sensitivity, or lower intolerance of uncertainty. It is possible that describing is beneficial in terms of improving these outcomes when used in conjunction with another skill (e.g., nonjudgment), but is not on its own relevant for improving affect tolerance among individuals with unwarranted health concerns. Similarly, though we hypothesized that greater observing would have negative implications for distress tolerance, anxiety sensitivity, and intolerance of uncertainty, this skill was not a unique predictor of any affect tolerance outcomes, nor was it significantly correlated with these outcomes at the bivariate level. Indeed, greater levels of observing alone are typically associated with worsened emotional outcomes in non-meditators (Baer et al., 2006; Baer et al., 2016; Gu et al., 2016).

Also contrary to our hypothesis, despite being significant when taken together, none of the individual mindfulness skills were unique predictors of anxiety sensitivity, and only non-reactivity was specifically relevant to intolerance of uncertainty. One interpretation of these results is that all of the mindfulness skills may be equally important for anxiety sensitivity. Thus, mindfulness-based interventions to reduce anxiety sensitivity would need to teach mindfulness as a unified process of interacting components that are each equally important, rather than as a set of distinct skills individuals can pick and choose from (Grossman & Van Dam, 2011). Lastly, while non-reactivity emerged as the only unique predictor of intolerance of uncertainty, this skill only accounted for 2% of unique variance, while the second step as a whole accounted for an additional 6.8% variance in intolerance of uncertainty. While this finding suggests that mindfulness-based interventions targeting intolerance of uncertainty may benefit from emphasizing the skill of non-reactivity, it may be equally important to teach and cultivate the other mindfulness skills in order to improve tolerance of anxious distress resulting from uncertainty in health anxious populations. These findings also raise the consideration as to whether mindfulness is best captured by unidimensional or

multidimensional assessment models; indeed, the measurement of mindfulness remains a complex, ongoing area of investigation requiring careful research attention. There remains speculation about the optimal self-report measures of mindfulness, and the current findings highlight the need for further investigation in this area, both in general and in terms of patients with elevated health anxiety symptoms specifically.

There are, however, limitations to the current study that warrant consideration. First, although the current study utilized a well-established cut-off score on the SHAI for identifying clinically elevated health anxiety, future work should consider utilizing structured clinical interviews for identifying the most extreme levels of health anxiety (e.g., hypochondriasis, illness anxiety disorder, somatic symptom disorder) and recruit a more demographically diverse community sample. However, it has been suggested that the use of undergraduate samples in the study of health anxiety can be helpful due to the fact that they are less confounded with serious medical problems (Kaur, Butow, & Sharpe, 2013). Moreover, this population may be important given that psychopathology typically emerges in young adulthood (Kessler et al., 2005). Second, the current study relied solely on self-report indices of mindfulness and affect tolerance and regulation and utilized a cross-sectional design. Future work would benefit from a multi-method approach that incorporates behavioral measures of affect tolerance and regulation and also replicates these findings longitudinally, perhaps examining changes in these factors over the course of a mindfulness-based intervention for health anxiety.

Despite these limitations, results of the current study suggest that greater mindfulness, in general, is related to greater distress tolerance and lower anxiety sensitivity and intolerance of uncertainty among individuals who are high in health anxiety. In particular, a greater ability to notice present moment events, accept them non-judgmentally, and withhold reactivity appears to be most salient for distress tolerance. Mindfulness training that targets these skills may be beneficial in improving distress tolerance, and a global approach to mindfulness training may be useful for decreasing anxiety sensitivity and intolerance of uncertainty. Further research is needed to explore optimal methods for measuring mindfulness skills as both a unidimensional or multidimensional construct.

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Table 1:

Descriptive statistics and intercorrelations among predictor and criterion variables.

	1	2	3	4	5	6	7	8	9	10	11	M	SD	Range
1. Gender	-	.07	.10	−.18**	.07	−.03	.06	−.03	−.06	−.10	−.12	--	--	--
2. Medical Problems	-	-	−.00	.04	−.07	−.09	.17*	.09	−.04	−.02	.05	--	--	--
3. PANAS-NA	-	-	-	−.55**	.41**	.42**	−.02	−.20**	−.36**	−.45**	−.41**	25.28	6.36	10-41
4. DTS	-	-	-	-	−.47**	−.47**	−.05	.29**	.44**	.57**	.50**	2.97	.76	1.20-4.80
5. ASI-3	-	-	-	-	-	.37**	.08	−.22**	−.30**	−.37**	−.29**	22.39	12.27	2-63
6. IUS-12	-	-	-	-	-	-	−.01	−.27**	−.29**	−.37**	−.33**	35.45	9.84	12-60
7. FFMQ-Observing	-	-	-	-	-	-	-	.23**	−.03	−.25**	.25**	26.62	4.75	15-38
8. FFMQ-Describing	-	-	-	-	-	-	-	-	.29**	.24**	.31**	24.84	5.41	9-40
9. FFMQ-Awareness	-	-	-	-	-	-	-	-	-	.48**	.23**	22.93	5.46	8-39
10. FFMQ-Nonjudgment	-	-	-	-	-	-	-	-	-	-	.21**	24.30	6.03	8-39
11. FFMQ-Nonreactivity	-	-	-	-	-	-	-	-	-	-	-	20.32	3.77	8-29

* $p < .05$,

** $p < .01$

Note: Gender: 1 = male, 2 = female; Medical Problems: 0 = no reported medical conditions, 1 = presence of one or more medical conditions; PANAS-NA: Positive Affect Negative Affect Schedule-Negative Affect subscale (Watson et al., 1988); DTS: Distress Tolerance Scale (Simons & Gaher, 2005); ASI-3: Anxiety Sensitivity Index-3 (Taylor et al., 2007); IUS-12: Intolerance of Uncertainty Scale-Short Form (Carleton et al., 2007); FFMQ: Five Facet Mindfulness Questionnaire (Baer et al., 2006)

Table 2.

Mindfulness skills predicting affect tolerance factors

	ΔR^2	*t* (each predictor)	*B* (95% CI)	*β*	sr^2	*p*
Criterion Variable: DTS						
Step 1	.32					.000**
Constant		18.65	5.07 (4.53 to 5.61)			.000**
Gender		−2.30	−.26 (−.49 to −.04)	−.14	.02	.023*
Medical Problems		.68	.07 (−.13 to .26)	.04	.00	.499
PANAS-NA		− 8.52	−.07 (−.08 to −.05)	−.53	.27	.000**
Step 2	.22					.000**
Constant		2.99	1.62 (.55 to 2.68)			.003
Gender		−1.81	−.18 (−.37 to .02)	−.09	.01	.072
Medical Problems		.91	.08 (−.09 to .24)	.05	.00	.367
PANAS-NA		−3.72	−.03 (−.04 to .01)	−.23	.04	.000
FFMQ-Observing		−1.73	−.02 (−.04 to .00)	−.10	.01	.085
FFMQ-Describing		.98	.01 (−.01 to .02)	.06	.00	.328
FFMQ-Awareness		2.48	.02 (.00 to .04)	.15	.02	.014*
FFMQ-Nonjudgment		4.14	.04 (.02 to .05)	.27	.04	.000**
FFMQ-Nonreactivity		4.81	.06 (.04 to .09)	.29	.06	.000**
Criterion Variable: ASI-3						
Step 1	.19					.000**
Constant		.61	2.84 (−6.32 to 12.01)			.541
Gender		−.18	−.34 (−4.19 to 3.51)	−.01	.00	.860
Medical Problems		−1.47	−2.47 (−5.79 to .84)	−.10	.01	.142
PANAS-NA		6.30	.85 (.58 to 1.12)	.43	.18	.000**
Step 2	.07					.012*
Constant		2.48	26.90 (5.46 to 48.34)			.014*
Gender		−.60	−1.14 (−4.91 to 2.63)	−.04	.00	.550
Medical Problems		−1.61	−2.68 (−5.97 to .61)	−.11	.01	.110
Negative Affect		3.59	.57 (.25 to .88)	.29	.06	.000**
FFMQ-Observing		1.43	.28 (−.11 to .67)	.11	.01	.154
FFMQ-Describing		−.79	−.13 (−.46 to .20)	−.06	.00	.433
FFMQ-Awareness		−.65	−.12 (−.46 to .23)	−.05	.00	.515
FFMQ-Nonjudgment		−1.63	−.28 (−.63 to .06)	−.14	.01	.105
FFMQ-Nonreactivity		−1.92	−.49 (−1.00 to .01)	−.15	.02	.056
Criterion Variable: IUS-12						
Step 1	.21					.000**
Constant		5.84	21.14 (14.00 to 28.28)			.000
Gender		−.59	−.91 (−3.94 to 2.12)	−.04	.00	.556
Medical Problems		−2.18	−2.92 (−5.56 to −.28)	−.15	.02	.031

	ΔR^2	*t* (each predictor)	*B* (95% CI)	*β*	sr^2	*p*
PANAS-NA		6.60	.69 (.48 to .90)	.45	.20	.000**
Step 2	.07					.008**
Constant		5.24	45.11 (28.10 to 62.11)			.000
Gender		−1.03	−1.56 (−4.53 to 1.42)	−.07	.00	.303
Medical Problems		−1.96	−2.61 (−5.24 to .02)	−.13	.02	.051
PANAS-NA		3.72	.46 (.22 to .70)	.30	.06	.000
FFMQ-Observing		.79	.12 (−.18 to .43)	.06	.00	.429
FFMQ-Describing		−1.80	−.23 (−.49 to .02)	−.13	.01	.073
FFMQ-Awareness		−.25	−.04 (−.31 to .24)	−.02	.00	.800
FFMQ-Nonjudgment		−1.34	−.18 (−.46 to .09)	−.11	.01	.183
FFMQ-Nonreactivity		−2.18	−.46 (−.88 to −.04)	−.17	.02	.030

*$p < .05$,

**$p < .01$

Note: Gender: 1 = male, 2 = female; Medical Problems: 0 = no reported medical conditions, 1 = presence of one or more medical conditions; PANAS-NA: Positive Affect Negative Affect Schedule-Negative Affect subscale (Watson et al., 1988); DTS: Distress Tolerance Scale (Simons & Gaher, 2005); ASI-3: Anxiety Sensitivity Index-3 (Taylor et al., 2007); IUS-12: Intolerance of Uncertainty Scale-Short Form (Carleton et al., 2007); FFMQ: Five Facet Mindfulness Questionnaire (Baer et al., 2006)