

Amount of Practice in the Development of Mindfulness Skills and Symptom Improvement in an Acceptance Based Behavioral Therapy for Generalized Anxiety Disorder

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Introduction

Formal mindfulness practices are considered a critical component of many mindfulness- and acceptance-based treatments (Kabat-Zinn, 1982; Teasdale et al., 2000). Amount of formal mindfulness practice has been shown to be associated with increases in mindfulness skills and expected changes in outcome variables over time in clinical and non-clinical samples, however, a meta-analysis showed that overall findings have been mixed (Vettese et al., 2009). An acceptance-based behavior therapy (ABBT) developed to treat Generalized Anxiety Disorder (GAD) and comorbid conditions focuses on helping clients develop a more accepting relationship with their unwanted internal experiences, increase engagement in valued life actions, and develop mindfulness skills to help facilitate these processes and decrease avoidance (for a detailed description of ABBT see Roemer & Orsillo, 2009). This treatment has been found to be efficacious in treating people with a principal diagnosis of GAD in an open trial and a randomized waitlist control trial (Roemer, Orsillo, & Salters-Pednault, 2008; Roemer & Orsillo, 2007). Formal mindfulness practice entails explicitly setting aside time to practice mindfulness in order to develop skills. This involves practices like bringing awareness to the breath, sounds, or thoughts for a set period of time. Informal practices entail engaging mindfully in daily activities such as eating, walking to get somewhere, driving, or doing the dishes. The present study empirically investigates a yet to be tested assumption of ABBT, that higher reported average frequency of between-session formal mindfulness practice is associated with increases in mindfulness skills, decreases in worry, and increases in subjective quality of life from pre to post treatment.

Methods

Twenty-seven people completed at least 14 of the 16 total treatment sessions of ABBT, and were included in these analyses as “completers” (see Table 1 for demographic information). All participants began treatment with a principal diagnosis of GAD and a range of comorbid presenting problems. Outcome measures included: the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990), which demonstrated good

Table 1. Demographic Information (n=27)

Self Identified Race		Sexual Orientation	
White (non-Latino)	22 (81%)	Gay, Lesbian, or Bisexual	2 (8%)
White (Latino)	2 (6%)	Heterosexual	25 (92%)
Asian	1 (3%)	Gender Identity	
Black	1 (3%)	Female	18 (67%)
Biracial	1* (3%)	Male	9 (33%)
*This individual described their biracial identity as Asian and White		Age	
		Mean = 34.6	SD = 12.3

internal consistency with Cronbach's α 's of .83 and .86 at pre- and post-treatment, respectively, in the current sample; an abbreviated version of the Quality of Life Inventory (QOLI; Frisch, Cornwall, Villanueva, & Retzlaff, 1992), a measure of life satisfaction across a number of important domains, which demonstrated good internal consistency, with Cronbach's α 's of .89 at both pre- and post-treatment in the current study; and the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006), a widely used measure of mindfulness skills that demonstrated high internal consistency, with Cronbach's α of .91 at pre, and .96 at post-treatment in the current sample. The FFMQ is made up of five facets (*observe, describe, act with awareness, nonjudge, and nonreact*).

Mindfulness Practice Measure: At each session, therapists recorded the number of times clients reported engaging in formal mindfulness meditation practice since the previous session, using written tallies from clients in conjunction with verbal reports. Average frequency of formal between-session mindfulness practice was calculated for each participant across the entire period of treatment, as well as separately for the first and second halves of treatment.

Results

Across treatment, participants reported average frequencies of between-session formal mindfulness practice ranging from 1.40 to 13.60, with an overall average of 6.45 and a standard deviation of 2.89. Overall average frequency of practice for the first and second halves of treatment were 6.37 (SD=3.00) and 6.55 (SD=3.50), respectively.

Mindfulness skills, worry, and quality of life measures all improved significantly in expected directions and with large effect sizes (Cohen's d 's of 1.18 for the FFMQ, 1.51 for the PSWQ, and 0.84 for the QOLI) from pre- to post-treatment in the current sample (paired-samples t-tests, all p 's < .001). Residualized gain scores were calculated for mindfulness skills (total FFMQ as well as each individual factor), worry, and quality of life to remove the variance in the post-treatment scores accounted for by their pre-treatment levels.

Table 2. Correlations between average frequency of formal mindfulness practice and mindfulness skills

Average Practice Frequency	FFMQ Total	FFMQ Observe	FFMQ Describe	FFMQ Act with Awareness	FFMQ Nonjudge	FFMQ Nonreact
Entire Treatment	.27	.12	.25	.29	.15	.26
First half	.24	.02	.32 ^a	.19	.22	.25
Second half	.23	.20	.11	.32 ^a	.03	.22

Note: FFMQ=Five Facet Mindfulness Questionnaire, a = non-significant, but medium effect size

Table 3. Correlations between average frequency of formal mindfulness practice and worry and quality of life

Average Practice Frequency	PSWQ	QOLI
Entire Treatment	-.12	-.06
First half	-.09	-.06
Second half	-.12	-.06

Note: PSWQ=Penn State Worry Questionnaire; QOLI=Quality of Life Inventory

Correlations were calculated between average weekly frequency of mindfulness practice and residualized gain scores for mindfulness skills (total and individual factors), worry, and quality of life scores. Average weekly frequency of formal practice (across the entire treatment as well as the first and second halves separately) was not significantly correlated with residualized gain scores for any other variables, although they had positive relationships with medium or close to medium effect sizes with total mindfulness skills as well as a number of individual FFMQ factors (see Tables 2 and 3).

Residualized gain scores of total mindfulness skills were significantly correlated with worry [$r(25) = -.64, p < .001$] and nearly significantly related to quality of life [$r(25) = .39, p = .05$] (see Table 4). All facets of the FFMQ had significant negative correlations with the PSWQ. The correlation between the QOLI and the describe factor of the FFMQ was positive and significant [$r(26) = .41, p = .04$]. Residualized gain scores of worry were significantly negatively correlated with residualized gain scores of quality of life [$r(25) = -.46, p = .02$]. All correlations were in the hypothesized directions.

Table 4. Correlations among mindfulness skills, worry, and quality of life

	QOLI	FFMQ Total	FFMQ Observe	FFMQ Describe	FFMQ Act with Awareness	FFMQ Nonjudge	FFMQ Nonreact
PSWQ	-.46*	-.64***	-.42*	-.56**	-.47*	-.59**	-.55**
QOLI	--	.39 ^a	.16	.41*	.37 ^a	.29	.35 ^a

Note: FFMQ = Five Facet Mindfulness Questionnaire; PSWQ = Penn State Worry Questionnaire; QOLI = Quality of Life Inventory; * = $p < .05$; ** = $p < .01$; *** = $p < .001$; a = non-significant, but medium effect size

Discussion

This study examined the relationships among average between-session frequency of formal mindfulness practice (across treatment and separately for the first and second halves of treatment) and mindfulness skills, worry, and quality of life in a sample of individuals with GAD receiving an acceptance-based behavior therapy. This study replicated findings that mindfulness skills, worry, and quality of life measures significantly improved with large effect sizes for participants with GAD who completed at least 14 of 16 sessions of an acceptance-based behavior therapy (ABBT). The results however, did not support the hypothesis that frequency of formal mindfulness practice is significantly correlated to improvements in mindfulness skills, worry, and quality of life. Practice frequency during the first half of treatment was related to the describe FFMQ factor with a moderate effect size, while practice during the second half was related in a similar way with the act with awareness factor, indicating practice during different periods may be more important for developing different aspects of mindfulness skills during treatment. It also may suggest that certain facets of mindfulness are learned in sequence, and that certain skill components may necessarily precede and facilitate other skill components.

The results showed that increases in mindfulness skills were significantly and strongly related to decreases in worry and nearly significantly related to increases in quality of life scores. Decreases in worry were also significantly related to improvements in quality of life.

There are, however, several methodological limitations with the current study that should be addressed in future research. The sample is small and homogeneous in relation to race and sexual orientation, increasing the risk of making Type II errors and precluding generalizations to more diverse populations. Importantly, the correlational nature of the analyses in this study prohibits any conclusions of directionality in the described relationships. Another important consideration is that informal mindfulness practice was not included in this analysis, and may function as an important component in learning mindfulness skills and applying mindfulness to worry and other difficult internal experiences. An important concept that has not yet received attention within the field is the quality of practice. There may be ways of learning and engaging in formal and informal practice that are more conducive to building mindfulness skills, and perhaps measures of quantity fail to reliably show relationships because of differences in how, when, or for whom mindfulness practice leads to improvements in mindfulness skills and outcomes. Moving forward it will be important to begin to address potential moderating variables relating to learning mindfulness, to help clinicians and instructors teaching mindfulness practices within treatment programs focus on elements of learning and practicing mindfulness that more robustly foster mindfulness skill building and application. Also, it will be important to get a better understanding of how the facets of mindfulness relate to each other across time, which could have implications for the design of mindfulness practice instruction.

In conclusion, the results of the current study highlight the need for further exploration of the utility of mindfulness practice as beneficial for the development of mindfulness skills and improvement on outcome measures. Longitudinal studies with multiple assessment points over longer periods of time could help clarify the nature and directionality of these relationships. Additionally, future studies with more comprehensive measurements of mindfulness practice are needed to distinguish between the potential differential effects of formal vs. informal practice on treatment gains.

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