Examination of a Brief Anxiety Sensitivity Cognitive Concerns Intervention on Suicidality
among Individuals with Obsessive-compulsive Symptoms

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Abstract

A growing body of research has demonstrated elevated rates of suicidality among individuals with obsessive-compulsive disorder (OCD). Recently, it has been proposed that the cognitive concerns component of anxiety sensitivity (AS) may be one factor contributing to this association. AS cognitive concerns, which reflect fears of mental incapacitation, has been found to be associated with OCD and increased suicidality in a number of populations. However, questions remain as to whether reductions in AS cognitive concerns will lead to subsequent reductions in suicidality among individuals with OCD symptoms. In the current study, the sample (N = 54) was comprised of individuals with elevated OCD symptoms recruited from the community who were participating in a larger randomized clinical trial. Individuals were randomly assigned to a one-session AS cognitive concerns intervention or a health information control intervention and assessed at post-treatment and one-month follow-up. Results indicated that the active intervention produced significantly greater reductions in AS cognitive concerns immediately post-intervention. Moreover, changes in AS cognitive concerns following the intervention mediated changes in suicidality at one-month follow-up. Findings are discussed in regard to adjunct interventions for OCD.

Keywords: anxiety sensitivity; cognitive concerns; obsessive-compulsive symptoms; suicide; intervention

Introduction

Despite literature attesting to the associations between anxiety disorders and suicide, little research has focused on obsessive-compulsive disorder (OCD) and suicide. However, the limited research available indicates relatively high rates of suicidal risk in OCD samples [1; 2]. For example, Hollander et al., [3] found that individuals with OCD were 3 times more likely to attempt suicide compared to individuals without a psychiatric diagnosis and 2 times more likely to attempt suicide as individuals with another psychiatric diagnosis. Torres et al., [4] extended these findings by examining the associations between OCD symptoms and different aspects of suicidal behavior. In this sample, 36% reported a lifetime history of suicidal thoughts, 20% had made suicidal plans, 11% had attempted suicide at least once, and 10% had current suicidal ideation.

Despite these associations, research examining potential mechanisms that could influence the OCD-suicide association is nascent. One factor that may be accounting for the relation between OCD and suicide is anxiety sensitivity (AS) [5]. AS reflects an individual's fear of the autonomic arousal due to the belief that there will be adverse physical, cognitive, and/or social consequences associated with this arousal [6; 7]. Extant research has established an association between AS and OCD symptoms [8]. Additionally, research has also established an association between AS and suicidality, in particular the cognitive domain of AS [9-11]. Raines et al., [5] recently extended these findings to OCD symptoms and suicidality. Controlling for relevant covariates, for those at high levels of AS cognitive concerns but not at low levels of AS cognitive concerns, the effect of OCD obsessions was significantly associated with increased suicidal risk.

A separate line of research has indicated that AS is amenable to change [12; 13] and changes in AS are linked with symptom improvement. For example, in the full sample efficacy

study from which current study participants were selected, Schmidt et al., [14] examined the effects of a Cognitive Anxiety Sensitivity Treatment (CAST) compared to a health information control condition and found that the CAST, relative to the control condition, produced significant reductions in AS at post-treatment and follow-up that were specific to the cognitive concerns component. Additionally, changes in AS cognitive concerns mediated symptom change at follow-up for various adverse outcomes including suicidal ideation. However, it is unclear whether the intervention will be efficacious in subgroups of individuals, such as those with elevated OCD symptoms.

The present study was a subgroup analysis to determine whether AS cognitive concerns could be reduced among those with elevated OCD symptoms. It was hypothesized that an AS cognitive concerns intervention compared to a health information control condition, would lead to greater reductions in AS cognitive concerns post-intervention for individuals with elevated OCD symptoms. Second, it was hypothesized that the AS cognitive concerns intervention, compared to the health information control condition, would lead to reductions in suicidality over time (i.e., one-month follow-up). Finally, it was hypothesized that intervention-related changes in AS cognitive concerns (immediately post-intervention) would mediate changes in suicidality over time (e.g., one-month follow-up) among individuals with elevated OCD symptoms.

Methods

Participants

The sample consisted of 54 individuals selected from a larger randomized clinical trial examining the efficacy of a computerized intervention targeting AS cognitive concerns, a risk factor associated with anxiety, OCD, and suicide. Participants had to be 18 years of age or older,

English speakers, and endorse elevated levels of AS cognitive concerns (as defined by scoring 1.5 SDs above the non-clinical mean [≥ 8]) to be eligible for the larger study. Exclusion criteria included current psychotic and/or bipolar disorder or unstable medication usage. For the current study, participants were selected if they reported elevated OCD symptoms, as defined by scoring a total of at least an 18 on the Obsessive Compulsive Inventory – Revised (OCI-R) [15], which is the recommended clinical cut-score for a mixed anxiety disorder sample.

Participants' ages ranged from 18 to 68, with a mean of 38.15 years old ($SD = 15.24$). The sample was 65.6% female. The majority of participants self-identified as White/Caucasian (62.3%), followed by Black/African-American (24.6%), other (e.g., biracial; 8.2%), Hispanic/Latino (3.3%), and Asian (1.6%). According to our diagnostic interview, 93.4% of participants presented with a current Axis I disorder. Specifically, 19.6% of the sample met criteria for a primary or other current diagnosis of OCD ($n = 12$). In terms of other primary diagnoses, participants presented with the following: anxiety disorders (40.9%), trauma and stress-related disorders (24.6%), mood disorders (16.3%), eating disorders (3.3%), and other (3.2%; e.g., alcohol use disorders).

Procedures

Participants were recruited from the community through various media outlets. Interested individuals completed a brief telephone screen followed by a more extensive intake appointment. Following informed consent, participants completed a battery of self-report measures and a diagnostic interview [16]. Next, participants were randomized into either the AS cognitive concerns treatment condition or a health information control condition. Finally, participants returned to the laboratory one month after the intervention to complete a follow-up assessment. Main outcome findings from the larger study are reported in Schmidt, Capron, Raines, & Allan

[14]; however, the current findings specific to OCD symptoms have not been reported elsewhere. All study procedures were approved by the university's IRB and granting agency.

Measures

Clinician-Administered

Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I). All participants were interviewed using the SCID-I Non-Patient version [16]. Highly-trained clinical psychology doctoral-level students administered SCIDs after receiving extensive training in SCID administration. Additionally, a licensed clinical psychologist reviewed all SCIDs to confirm accurate diagnoses. High inter-rater agreement was obtained between interviewers for a random sample (i.e., 15%) of these SCIDs (i.e., over 80% with a kappa value of .77).

Self-report

Anxiety Sensitivity Index-3 (ASI-3). The ASI-3 is an 18-item self-report measure of feared consequences of sensations associated with anxious arousal [17; 18]. The ASI-3 includes three subscales reflecting fears of the physical, cognitive, and social domains of anxiety. All three subscales demonstrated good internal consistency at baseline (cognitive $\alpha = .91$, physical $\alpha = .84$, and social $\alpha = .83$) and post-intervention (cognitive $\alpha = .95$, physical $\alpha = .89$, and social $\alpha = .87$).

Obsessive Compulsive Inventory-Revised (OCI-R). The OCI-R is an 18-item self-report measure of common symptom dimensions of OCD [15]. In the current study, the OCI-R was administered at baseline only to select for individuals with elevated levels of OCD symptoms, as defined by scoring at or above the clinical cut-score for mixed anxiety disorder samples [15] (i.e., ≥ 18). The OCI-R demonstrated good internal consistency ($\alpha = .80$).

Suicidal Behavior Questionnaire-Revised (SBQ-R). The SBQ-R is a 4-item self-report questionnaire assessing prevalence of suicidal thoughts and behaviors, past 12 months suicidal ideation, threat of suicidal behavior, and future suicidal risk [19]. Respondents answered questions such as “How often have you thought about killing yourself in the past year?” and “How likely is it that you will attempt suicide someday?” Scores for each item are totaled, with higher scores indicating more severe suicidality. The SBQ-R has demonstrated acceptable psychometric properties in previous research [19] and was administered at baseline and one-month follow-up. Psychometric analyses indicated adequate internal consistency at baseline ($\alpha = .73$) and one-month follow-up ($\alpha = .80$).

Experimental Conditions

Cognitive Anxiety Sensitivity Treatment (CAST). CAST is a computerized intervention designed to closely model the education and behavioral techniques commonly used in anxiety treatments [14]. A psychoeducation component focused on the nature of stress and its effects on the body and cognitive processes. Participants were taught that the psychological arousal arising from stress is not dangerous and that they may have developed a conditioned fear to these sensations, as indicated by their elevated levels of AS. Interoceptive exposure (IE) exercises were introduced as a way to correct the conditioned fear response to psychological sensations. With the programs direction and assistance, participants completed a brief hyperventilation exercise and rated the level of fear/distress experienced on a ten-point scale. This exercise was repeated for ten trials. The CAST intervention took approximately 45 minutes to complete and participants were encouraged to continue practicing the exercises at home until none of the exercises generated any fear/distress.

Physical Health Education Training (PHET). PHET took around 45 minutes to complete and was designed to control for the effects of receiving a treatment. Participants were presented with information regarding the importance and benefits of maintaining a healthy lifestyle. The program discussed diet, alcohol and water consumption, exercise, sexual health, and sleep. The program instructed the participant how to monitor and incorporate health habits into their daily life.

Results

Sample Descriptives

Means and standard deviations by condition as well as zero-order correlations for all self-report variables can be found in Table 1. Thirty-five individuals were assigned to the CAST intervention and 26 individuals were assigned to the PHET control condition (see Figure 1 CONSORT diagram). One individual from each condition did not receive the allocated intervention. Additionally, five individuals (three from the PHET condition and two from the CAST) did not complete the one-month follow-up. Thus, their data was not used in the current analyses. There were no differences in age, gender, baseline ASI-3 cognitive concerns, OCI-R, and SBQ-R total scores between those individuals who did and did not complete the one-month follow-up. In addition, to check for equivalence of random assignment to groups, differences in age, gender, baseline ASI-3 cognitive concerns, OCI-R, and SBQ-R total scores, as well as primary diagnoses were examined among individuals in the CAST intervention compared to those in the PHET control condition. Once again, results revealed that there were no significant differences in these variables across conditions (all p 's > .19). It should be noted that mean OCI-R total score for the current sample ($M = 32.95$, $SD = 11.00$) was well above the clinical cut score set forth by Foa and colleagues [15] suggesting that the current sample was experiencing

significant symptoms of OCD. Additionally, the mean SBQ-R ($M = 6.50$, $SD = 3.00$) total was higher than that found in a non-suicidal adult inpatient sample but lower than that found in a suicidal adult inpatient sample [19].

Direct Effects of Treatment Condition on AS Cognitive Concerns

A multiple regression equation was performed to assess the effects of treatment condition (CAST vs. PHET) on changes in AS cognitive concerns (as measured by the ASI-3 cognitive concerns difference score between baseline and post-intervention). Preliminary analyses indicated that there were no threats or violations of normality, multicollinearity, or homoscedasticity. Treatment condition accounted for 13% of the variance in changes in AS cognitive concerns ($F(1, 51) = 7.88$, $p = .007$). Results revealed there was a direct effect of treatment condition on changes in AS cognitive concerns ($\beta = -.37$, $t = -2.81$, $p = .007$, $sr^2 = .13$). In particular, individuals in the CAST condition evidenced significantly lower ASI-3 cognitive concerns scores post-intervention relative to individuals in the control condition.

Direct Effects of Treatment Condition on Suicidality

Next, a multiple regression equation was performed to assess the effects of treatment condition on changes in suicidality (as measured by the SBQ-R difference score between baseline and one-month follow-up). Preliminary analyses indicated significant skew [20]. Therefore, the SBQ-R change scores were normalized using a square-root transformation. However, there were no substantive differences in the findings. Therefore, all results are reported with the non-transformed SBQ-R change score. There were no other threats or violations of normality, multicollinearity, or homoscedasticity. Treatment condition accounted for .9% of the variance in changes in suicidality ($F(1, 51) = .44$, $p = .51$). Results revealed there was not a

direct effect of treatment condition on changes in suicidality ($\beta = -.09$, $t = -.67$, $p = .51$, $sr^2 = .01$).

Indirect Effects of Treatment Condition on Suicidality via AS Cognitive Concerns

Asymmetric bootstrapping mediation procedures were used to examine the indirect effect of treatment condition on changes in suicidality (as measured by the SBQ-R difference score between baseline and one-month follow-up) via changes in AS cognitive concerns (as measured by the ASI-3 cognitive concerns difference score between baseline and post-intervention). Mediation analyses were conducted using the Process macro for SPSS [21] with the recommended bootstrap technique of 5,000 bootstrap resamples. Results revealed that there was not a direct effect of treatment condition on changes in suicidality ($B = .05$, $p = .93$). Regarding the direct effect of changes in AS cognitive concerns on changes in suicidality, results were marginally significant ($B = .12$, $p = .05$). The indirect effect of treatment condition on changes in suicidality via changes in AS cognitive concerns, was significant (95% CI [-1.10, -.04]; see Figure 2).

Finally, a multiple mediator models approach was used to examine the indirect effect of treatment condition on changes in suicidality via changes in AS cognitive concerns, AS physical concerns, and AS social concerns. Once again, results revealed that there was not a direct effect of treatment condition on changes in suicidality ($B = -.15$, $p = .81$). Regarding the direct effect of changes in the mediators on changes in suicidality, results were significant for AS cognitive concerns ($B = .18$, $p = .04$) but not AS physical ($B = -.14$, $p = .07$) or AS social concerns ($B = -.09$, $p = .27$). The indirect effect of treatment condition on changes in suicidality via changes in AS cognitive concerns was significant (95% CI [-1.30, -.03]) whereas the indirect effect of

treatment condition on changes in suicidality via changes in AS physical (95% CI [-.65, .35]) and social concerns (95% CI [-.86, .02]) were not.

Discussion

Consistent with initial prediction, treatment significantly reduced AS cognitive concerns scores post-intervention suggesting that AS is malleable even among those with elevated OCD symptoms. This finding is consistent with previous research demonstrating the malleable nature of AS in other samples [12; 13; 22].

Whereas changes in AS cognitive concerns were only marginally associated with changes in suicidality over time, these effects would have been significant had we accounted for the expected direction of the effects (e.g., had we conducted a one-tailed instead of two-tailed significance test). These findings also support previous research establishing an association between AS cognitive concerns and suicide. For example, Capron and colleagues have found associations between AS, in particular AS cognitive concerns, and suicidal ideation in a number of populations with elevated rates of suicidality including individuals with HIV, cigarette smokers, and Russian citizens [9; 10; 23; 24]. The current study expands upon this line of research by replicating these associations among individuals with elevated OCD symptoms. Additionally, this study demonstrates that an AS cognitive concerns intervention leads to reductions in suicidality through reductions in AS cognitive concerns rather than changes in AS physical or social concerns, providing further support that AS cognitive concerns may be an important mechanism accounting for increased levels of suicidality among individuals with anxiety and related disorders.

Inconsistent with initial prediction however, treatment did not have a direct main effect on suicidality. Although unanticipated, this finding is consistent with previous AS amelioration

trials in which direct effects of the intervention on more global symptoms (e.g., depression) were not found [12]. Whereas traditional methods for assessing mediation specified that direct effects were critical for testing mediation models [25], more recent statistical approaches state that direct effects are not necessary or even expected when the outcome of interest is not likely to be affected directly or when the outcome variable is measured distally from the independent variable [26; 27]. As Shrout and Bolger [27] indicate, for more distal causal processes the effect size tends to decrease due to additional effects on the outcome of interest as well as random noise, suggesting that direct effects from treatment to outcome variables not directly targeted by the intervention might not be significant. Consistent with this idea, the intervention did have a direct effect on proximal targeted constructs such as AS cognitive concerns, but not on more distal outcomes such as suicidality.

Results from this investigation also support the idea that AS cognitive concerns may be an important mechanism affecting suicidality among individuals with OCD symptoms by demonstrating that an AS cognitive concerns intervention appears to reduce suicidality via reductions in AS cognitive concerns. More broadly, the current findings are also consistent with recent models of anxiety and suicidality suggesting that the experience of catastrophic cognitions in response to anxiety may render individuals more vulnerable to the development of suicidality [28; 29]. More specifically, anxious arousal may be amplified by catastrophic cognitions, such as those associated with AS cognitive concerns, leading to increased distress, anxious arousal, and suicidal ideation. Eventually, the individual may be motivated to attempt suicide to stop the escalating feedback loop of emotional distress [28]. Within this model, reducing one's AS cognitive concerns should help to end this feedback loop by neutralizing the amplification of anxious arousal, which would then reduce one's distress and suicidal ideation.

The present findings also have important clinical implications. For patients with OCD, assessing levels of AS, particularly AS cognitive concerns is warranted. If AS is elevated, it may be beneficial for clinicians to target AS using brief AS amelioration interventions. Such interventions have been found to reduce AS and its subfactors over a two year period [13], and to reduce suicidality among individuals with elevated AS [14; 30]. Although this is an initial investigation, these findings suggest AS may be a promising intervention target for individuals with OCD symptoms experiencing suicidal ideation and/or behaviors.

There were several limitations of the current study that warrant consideration when interpreting the findings. First, the OCI-R was used to measure OCD symptoms. Compared to newer measures of OCD, such as the Dimensional Obsessive Compulsive Scale [31], the OCI-R does not capture the heterogeneous and multidimensional severity of OCD symptoms as adequately. Second, although individuals in this sample were selected for elevated OCD symptoms, the majority of the population did not meet criteria for an OCD diagnosis. Although many agree that OCD symptoms occur on a continuum of severity [32], there are several recent studies challenging this notion, suggesting there may be categorical distinctions [33; 34], which leaves open the possibility that these effects might be moderated by OCD symptom classes. It is also possible that the associations between AS and suicidality may be more relevant to certain OCD dimensions. Indeed, a number of investigations have found specific associations between sexual/religious obsessions and increased suicidality [35; 36]. Third, whereas the SBQ-R is a valid and reliable measure of suicidality, it assesses both current and lifetime suicidal risk and thus may not be sensitive enough to detect changes in suicidality from baseline to follow-up. However, our results did show reductions in SBQ-R mediated through AS cognitive concerns. One possibility for these findings is that we could be detecting changes in one perception of risk

rather than objective reporting of risk. A final limitation of the current study is that all constructs of interest were measured using self-report. Multi-method approaches including psychophysiological or neurophysiological measures of AS and suicidality would provide additional support that the ameliorations in self-report measures possess biological correlates.

Despite these limitations, there are significant strengths of the study to consider. This study was the first to demonstrate that AS cognitive concerns intervention could reduce suicidality, via reductions in AS cognitive concerns, among individuals with elevated OCD symptoms. Given the malleable nature of AS, and the relations AS cognitive concerns, shares with both OCD symptoms and suicidality, AS cognitive concerns appears to be an important transdiagnostic risk factor to target in prevention and intervention programs for individuals with elevated levels of OCD symptoms and suicidality.

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Table 1

Means, standard deviations, and zero-order correlation for all variables used in the current analyses at baseline, post-intervention and month one follow-up

	1	2	3	4	5	6	7	8	9
1. BL OCIR	-								
2. BL AS Phys	.25	-							
3. BL AS Soc	.16	.48**	-						
4. BL AS Cog	-.03	.48**	.45*	-					
5. BL SBQR	.08	.11	.31*	.24	-				
6. Post AS Phys	.20	.57**	.12	.27	.06	-			
7. Post AS Soc	.20	.40*	.79**	.39*	.39*	.34*	-		
8. Post AS Cog	-.02	.31*	.19	.76**	.20	.56**	.37*	-	
9. M1 SBQR	.01	.01	.18	.18	.79**	.00	.36*	.26	-
PHET Mean	32.82	10.00	12.73	12.50	7.00	9.05	11.64	10.55	7.23
PHET SD	10.89	6.30	5.65	6.62	3.40	6.21	5.84	7.33	3.89
CAST Mean	33.52	12.23	14.00	14.10	6.13	6.94	11.13	8.58	5.97
CAST SD	12.24	5.46	5.66	6.59	2.78	5.80	6.19	7.04	2.85

Note. BL = Baseline, Post = Post intervention, M1 = Month 1, OCIR = Obsessive Compulsive Inventory Revised, AS Phys = Anxiety Sensitivity Index-3 physical concerns subscale, AS Soc = Anxiety Sensitivity Index-3 social concerns subscale, AS Cog = Anxiety Sensitivity Index-3 cognitive concerns subscale, SBQR = Suicidal Behavior Questionnaire Revised.

* $p < .05$, ** $p < .001$

Figure 1. CONSORT chart of participants detailing patient flow, assignment, and drop-out.

CONSORT = Consolidated Standards of Reporting Trials

Figure 2. Indirect effect of treatment condition (0 = control, 1 = active) on SBQ-R change score from baseline to month 1 through AS Cognitive Concerns change score from baseline to post-intervention. Nonsignificant lines are dashed.