Mechanisms of Change within Group Cognitive-Behavioural Therapy for Anxiety

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Abstract

Although the efficacy of group Cognitive-Behavioural Therapy (GCBT) is well documented, the mechanisms by which this therapy works are not well understood. Evaluating mediators and moderators of symptom change during therapy is an important step in the process of identifying the mechanisms that contribute to symptom change (Kazdin, 2007). Two studies were conducted in order to elucidate the process of symptom change within GCBT and to better understand how mediation of change during GCBT was evaluated in recent literature. The first study consisted of adults ($N = 15$) attending transdiagnostic GCBT for anxiety, whereby clients with different anxiety presentations were treated in the same group. The efficacy of this therapy group was evaluated, and cognitive change was examined as a potential mediator of symptom change. Results did not indicate significant symptom improvement, and the mediation hypothesis was not supported. The small sample size is a prominent limitation that may have contributed to the lack of statistically significant findings. The second study consisted of a systematic review of recent literature to determine how mediation is assessed during GCBT. A total of 30 studies met inclusion criteria, and were rated based on when potential mediators and outcomes were assessed. The most frequently used design measured outcomes and mediator variables at pre- and post-treatment only, which is a design that cannot determine the time sequence of change. Though many studies have investigated mediation, research designs that can truly identify a mediator have rarely been used. Together, the findings of the present studies highlight the need for future research to investigate mediation with more rigorous designs, while also using samples that are sufficient enough in size and representativeness to provide important information about how GCBT for anxiety works.

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List of Abbreviations

BAI	Beck Anxiety Inventory
BDI-II	Beck Depression Inventory – II
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CBT	Cognitive-Behavioural Therapy
CCL	Cognitions Checklist
CCL-D	Cognitions Checklist – Depression subscale
CCL-A	Cognitions Checklist – Anxiety subscale
EBM	Evidence Based Medicine
GCBT	Group Cognitive-Behavioural Therapy
IU	Intolerance of Uncertainty
IUS-12	Intolerance of Uncertainty Scale – Short Form
GAD	Generalized Anxiety Disorder OCD
	Obsessive-Compulsive Disorder
PANAS	Positive and Negative Affect Schedule
PANAS – PA	Positive and Negative Affect Schedule – Positive Affect subscale
PANAS – NA	Positive and Negative Affect Schedule – Negative Affect subscale
PSWQ	Penn State Worry Questionnaire
PTSD	Posttraumatic Stress Disorder
REB	Research Ethics Board

SAD	Social Anxiety Disorder
SEM	Structural Equation Modelling

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Mechanisms of Change within Group Cognitive-Behavioural Therapy for Anxiety

Cognitive-behavioural therapy (CBT) is a psychotherapy emphasizing thought restructuring and coping skills development (Portman, 2009) that has been rigorously tested in randomized controlled trials (RCTs). While the results of RCTs for individually delivered, disorder specific CBT are critical to investigating the efficacy of a therapy, it is also important to evaluate treatment formats that are frequently used in clinical settings. As group treatment formats are often utilized to deliver therapy in "real-world" settings, GCBT is the focus of this paper. Meta-analyses have supported the efficacy of GCBT in treating symptomatology related to various disorders, including but not limited to depression (Oei & Dingle, 2008), anxiety (Hans & Hiller, 2013; Stewart & Chambless, 2009), Irritable Bowel Syndrome (IBS; Li, Xiong, Zhang, Yu, & Chen, 2014), and substance use (Magill & Ray, 2009). Evidently, GCBT is an efficacious treatment format.

However, the processes by which GCBT exerts its effects are less clear. For example, group factors such as the group dynamics or cohesion could impact the extent to which one benefits from treatment, along with the impact of the CBT components. Different process variables may influence the effect of treatment, depending on the disorder or symptoms being treated. As GCBT may contain some process variables that differ from those in individual CBT, and this treatment format is commonly used in clinical settings, this thesis aimed to elucidate the processes that lead to change over the course of GCBT and how processes of change are assessed. More specifically, this thesis sought to gain a better understanding of both how change occurs in GCBT for anxiety, and how change is measured within GCBT for any disorder.

In order to achieve these two objectives, two studies were conducted. The first study focused on transdiagnostic GCBT for anxiety in order to examine a potential mechanism of

change within this specific type of therapy. The second study examined how mediation is established in current literature, and explored the mediators of GCBT that have been evaluated. Thus, the second study examined how mediation is assessed more generally, across GCBT for various diagnoses, as opposed to solely focusing on GCBT for anxiety. Within both studies, Kazdin's (2007) recommendations for assessing mechanisms of change were utilized. Kazdin asserted that the active mechanisms within therapy could begin to be understood by first investigating mediation.

STUDY 1: Does Cognitive Change Mediate Symptom Improvement in Transdiagnostic CBT for Anxiety?

Anxiety disorders are highly prevalent among the population and may negatively affect one's quality of life. The National Comorbidity Survey Replication in the United States determined that anxiety disorders were the most prevalent psychiatric disorder, with 18.1% of the population meeting criteria for an anxiety disorder (Kessler, Chiu, Demler, & Walters, 2005). Similarly, the one-year prevalence rate of anxiety disorders among adults in Ontario was 12% between 1990 and 1991 (Offord et al., 1996). The prevalence of anxiety may be even greater when considering individuals with anxiety symptoms who do not meet criteria for a disorder. In addition to their high prevalence, anxiety disorders are also highly troubling for individuals. Anxiety disorders may negatively affect one's quality of life (Saarni et al., 2007) to an extent that is comparable to the impact of chronic medical conditions (Lépine, 2002). Furthermore, anxiety disorders engender significant economic costs for individuals and society (Koerner et al., 2004; Rice & Miller, 1998). There were 11 anxiety disorders described within the *Diagnostic and Statistical Manual of Mental Disorders,* Fourth Edition, Text Revision (DSM-IV-TR), which included: panic disorder with and without agoraphobia, specific phobia, social phobia, obsessive-compulsive disorder (OCD), posttraumatic stress disorder (PTSD) and generalized anxiety disorder (GAD; American Psychiatric Association [APA], 2000). These anxiety disorders are still included in the fifth edition of this manual (DSM-5), though they are now separated into the categories of Anxiety Disorders, Obsessive-Compulsive and Related Disorders, and Trauma- and Stressor-Related Disorders (APA, 2013). The high prevalence, debilitating nature and economic burden of anxiety disorders indicate a need for these symptoms to be addressed and alleviated.

Consequently, it is important for efficacious treatments to be delivered and easily accessed by people experiencing symptoms of anxiety or depression. Randomized controlled trials testing the efficacy of psychotherapies for emotional disorders have primarily focused on disorder-specific protocols and the outcomes regarding that particular disorder. Meta-analyses of these studies have consistently supported the efficacy of CBT in treating anxiety disorders (Hoffman & Smits, 2008; Norton & Price, 2007). Moreover, CBT has demonstrated superiority over wait-list control groups and placebos for the treatment of anxiety disorders (Olatunji, Cisler, & Deacon, 2010). Though the utility of diagnosis-specific CBT has been well supported, recent research has suggested alternative benefits to treating patients with various anxiety disorders in a single CBT group, largely due to the feasibility of such a format. The study of transdiagnostic treatments is relatively nascent, creating a need to determine how this approach may be useful. Thus, the present study examined the utility of transdiagnostic GCBT in treating anxiety and depressive symptoms, while also exploring the active mechanisms within the therapy.

Transdiagnostic Theory

Rather than targeting a specific disorder, transdiagnostic treatments are broad therapy protocols that apply the same treatment principles to a diagnostically heterogeneous group (McEvoy, Nathan, & Norton, 2009). Transdiagnostic treatments are based on the idea that shared features exist across disorders and that these commonalities are greater than the differences between disorders (McEvoy et al., 2009). There appear to be many commonalities among anxiety and mood disorders, making transdiagnostic treatment possible. These commonalities are highlighted by McEvoy et al. (2009) as well as other authors, and include: shared clinical features (McManus, Shafran, & Cooper, 2010), comorbidity (Barlow, Allen, & Choate, 2004), shared maintaining processes (McManus et al., 2010), common underlying

constructs (Clark & Watson, 1991), and similar biological and psychological vulnerabilities (Andrews, 1991; Kendler, Heath, Martin, & Eaves, 1987).

Shared Features. There are some shared clinical features across the anxiety disorders, as they are commonly characterized by an overestimation of threat, avoidance, and physiological arousal (McManus et al., 2010). Beck (1976) asserts that overestimation of the possibility and dangerousness of threat is common across anxiety disorders. Fear often accompanies this perception of threat. Several anxiety disorders reflect the presence of fear. For example, the fear of a certain object may be associated with specific phobia, the fear of having panic attacks is related to panic disorder, and a fear of a specific event that is addressed with a compulsion can be present in OCD (APA, 2000). Worry is another shared clinical feature that pertains to an individual's perception of threat. Though worry is present across disorders, it is the focus of the worry that differentiates anxiety disorders from one another. For example, people with social phobia may worry about embarrassment, people with GAD may worry about everyday things and people with OCD may worry about contamination (Barlow, 2002). However, there are some instances when the same worry can be present among different disorders. For example, some of the worries held by an individual with GAD could relate to physical symptoms, yet worry in this domain could also be associated with panic disorder (McManus et al., 2010). The fear and worry associated with an overestimation of threat can be shared features across the anxiety disorders.

In addition to overestimation of threat, anxiety disorders are often characterized by avoidance and physiological arousal. The core criteria for agoraphobia, social phobia, specific phobia, and PTSD include avoidance of a particular situation (APA, 2000). Avoidant behaviours may also be demonstrated in other anxiety disorders where the avoidance is not included in the diagnostic criteria. The physiological arousal associated with anxiety disorders may be

manifested as sweating, trembling or shaking, heart palpitations, or dizziness. The experience of such physiological symptoms is included in the criteria for panic attacks, which can be associated with several anxiety disorders, depending on the context of the attacks (APA, 2000). Arousal associated with anxiety disorders may also include symptoms such as hypervigilance and difficulty sleeping, as seen with PTSD (APA, 2000). Therefore, avoidance and symptoms of physiological arousal are evident among many anxiety disorders.

Along with the features that characterize anxiety disorders, there are some other shared symptoms across the disorders. Symptoms such as unwanted thoughts, recurrent images, and checking behaviours can be present in several anxiety disorders (Huppert et al., 2005; McManus et al., 2010; Schut, Castonguay, & Borkovec, 2001). Also, physical conditions such as irritable bowel syndrome (Gros, Antony, McCabe, & Swinson, 2009), respiratory illnesses, and vestibular abnormalities (Barlow, 2002) are frequently associated with several of the anxiety disorders. Evidently, there is high overlap among the symptoms and associated features of anxiety disorders. The DSM-IV-TR criteria reliably discriminate between anxiety disorders, but there is sometimes diagnostic disagreement due to the overlapping symptoms (Brown, DiNardo, Lehman, & Campbell, 2001). Additionally, there are some shared features of anxiety and mood disorders, which may also relate to diagnostic disagreements (Brown et al., 2001). For example, GAD and depression share some symptoms such as fatigue, difficulty sleeping, and restlessness (Brown, Chorpita, & Barlow, 1998). Therefore, the symptom and diagnostic overlap among various anxiety and mood disorders indicates that commonalities exist among these disorders.

Comorbidity. Anxiety disorders are often comorbid with other Axis I disorders. In their study of adult outpatients seeking assessment and treatment at mental health centres, Brown, Campbell, Lehman, Grisham, and Mancill (2001) found that 55% of patients with a primary

anxiety diagnosis had a comorbid mood or anxiety disorder. Therefore, comorbidity appears to be more common than the presentation of a single anxiety disorder (Brown et al., 2001). The common co-occurrence of anxiety disorders and other Axis I disorders has also been indicated among adult patients presenting at a centre for anxiety disorders. Using structured diagnostic interviews, Sanderson, DiNardo, Rapee, and Barlow (1990) determined that 70% of the patients with an anxiety disorder also had another Axis I disorder. Specifically, a mood disorder was the additional diagnosis for 33% of the patients (Sanderson et al., 1990). Along with the frequent comorbidity of disorders for patients with anxiety disorder diagnoses, mood disorders appear to commonly co-occur with anxiety. Barlow et al. (2004) suggested that comorbidity may be a function of the overlap between diagnostic categories or it may be due to a solitary construct underlying these disorders. In the latter possibility, the presence of one disorder may increase one's risk of experiencing another disorder. Shared maintaining factors could also contribute to comorbidity. The high prevalence of comorbidity among anxiety and mood disorders supports the use of transdiagnostic group treatment from a practical perspective, since numerous disorders could be addressed with a unified treatment. The transdiagnostic approach is further supported as it may act upon the common constructs that lead to high comorbidity.

Common maintaining processes. Evidence has been generated to support the existence of common maintaining processes across anxiety and mood disorders. In a meta-analysis examining threat-related attentional biases, Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, and Van Ijzendoorn (2007) found that there is a similar bias among individuals with anxiety disorders, regardless of the presence of depression. This attentional bias consists of a tendency to pay greater attention to stimuli that are threat-related, compared to stimuli that are neutral. There is currently no consensus regarding the exact mechanisms that account for this bias, as

researchers have proposed various cognitive possibilities such as an automatic tendency to notice threats or a heightened inability to ignore threats. Nevertheless, this meta-analysis examining 172 studies indicates that threat-related bias is a robust phenomenon across the anxiety disorders, as it has been demonstrated with various experimental manipulations as well as across various populations. Furthermore, the attentional bias is not evident among individuals without anxiety. Bar-Haim and colleagues (2007) speculated that these results indicate a common component across anxiety disorders and symptoms of anxiety.

In addition to attentional bias, interpretational, reasoning, and thinking biases have been identified as common processes among some anxiety disorders (Harvey, Watkins, Mansell, & Shafran, 2004). Interpretational bias consists of interpreting ambiguous stimuli in an overly negative fashion. This bias has been demonstrated across some of the anxiety disorders such as panic disorder, social phobia, PTSD, and GAD (Harvey et al., 2004). Similarly across some anxiety disorders, there is evidence of expectancy and emotional reasoning biases. Expectancy biases consist of an overestimation of the possibility that a negative event will occur, while emotional reasoning biases consist of making conclusions about the likelihood of adverse events based on one's emotional state (Harvey et al., 2004). When an individual's thinking is influenced by their anxious state, it may exacerbate their expectancy for negative events. As such, it is evident that these reasoning biases can maintain one's anxiety. Additionally, Harvey and colleagues (2004) asserted that recurrent thinking in the form of worry or rumination over events and metacognitions where an individual reflects on their own thoughts, are common among anxiety disorders. Continuous reflection on anxious thoughts likely perpetuates further anxious thinking. Across various anxiety disorders, these interpretive, reasoning, and thinking biases appear to act as maintaining processes.

Along with the aforementioned cognitive processes, some behaviours that are widely demonstrated across anxiety disorders may maintain anxious symptoms or an individual's cognitions. Avoidance has been discussed as a shared feature across the anxiety disorders. This behaviour may also act as a process that maintains anxiety, since individuals do not come in contact with their fears and so their perceptions of the fear are not altered. Many people with anxiety disorders demonstrate safety behaviours that help them to cope with anxiety, which may also simultaneously maintain the underlying fear. For example, an individual with a diagnosis of social phobia may avoid eye contact in social situations. This behaviour would likely hinder the individual's social interaction, thereby providing support for his/her negative thoughts about social interactions (Harvey et al., 2004). Both cognitive biases and behaviours may act as maintaining mechanisms for various anxiety disorders. While the content of cognitions and specific behaviours would differ and allow differentiation among the disorders, there is some evidence supporting the presence of similar general processes.

Moreover, there may be similar neurological activation across some anxiety disorders. Etkin and Wager (2007) conducted a meta-analysis of studies utilizing functional magnetic resonance imaging and positron emission tomography imaging to investigate the brain regions that are active in individuals with anxiety. Results indicated amygdalar and insular hyperactivity among patients with PTSD, social anxiety disorder and specific phobia in comparison to controls. Though brain imaging also showed many differences in brain region activation among the disorders, the authors suggest that the common brain activation may be related to a similar neurobiological pathway for anxiety (Etkin & Wager, 2007). Along with the evidence of common maintaining processes among the anxiety disorders, the common neurological

activation provides additional support for the idea of similar processes underlying anxiety disorders.

Further evidence of common maintaining processes may be generated by the similar response of various anxiety disorders to the same treatment. Barlow (2000) asserted that anxiety disorders have been empirically demonstrated to respond to CBT and pharmacotherapy, such as the use of selective serotonin reuptake inhibitors (SSRIs), to a comparable degree. Similarly, Ballenger (1999) proposes that the high effectiveness of cognitive restructuring and exposure components in therapy for various anxiety disorders, suggests the presence of shared maintaining processes. If the same types of treatments influence change for different disorders, there are likely common processes or constructs underlying these disorders (Barlow, 2000).

Underlying constructs. Research has primarily focused on negative affect as a common construct underlying the anxiety and mood disorders. Negative affect is the extent to which an individual experiences adverse mood states, such as feeling upset or guilty (Clark & Watson, 1991). It has been correlated to both diagnoses and symptoms of anxiety and depression (Watson, Clark, & Tellegen, 1988). While studies have linked high negative affect to anxiety and depression (e.g., Hall, 1977; Tellegen, 1985; Watson, Clark, & Carey, 1988), low positive affect has been demonstrated to only relate to negative mood states (e.g., Tellegen, 1985; Watson et al., 1988). These findings are reflected in the tripartite model proposed by Clark and Watson (1991), which suggests that negative affect is common to anxiety and depression, while high physiological arousal is unique to anxiety and low positive affect is unique to depression. The model asserts that a single construct of negative affect underlies both anxiety and depression, while specific factors that are unique to anxiety and depression differentiate between these diagnostic categories. Negative affect in the model is related to symptoms that are common to

both anxiety and depression such as poor concentration, restlessness or irritability (Watson et al., 1995). These common symptoms and affect may explain the high relatedness between depression and anxiety (Watson et al., 1995). The low positive affect described in the model pertains to symptoms such as lacking energy and not feeling interested in anything, which are uniquely related to depression. Contrarily, symptoms of physiological arousal such as feeling dizzy or experiencing trembling, are uniquely related to anxiety (Watson et al., 1995). The tripartite model suggests that high negative affect can be indicative of the presence of anxious and depressive symptoms, but the exact presentation also depends on the presence of features that are specific to either anxiety or depression. Thus, the affective domain cannot be understood by the shared or unique features of anxiety and depression in isolation from one another. Rather, it is the holistic view of the shared features (negative affect) and unique features (physiological arousal and lack of positive affect) that allow for a full understanding of affect (Clark & Watson, 1991). Support for the tripartite model has been generated through content analyses indicating that physiological arousal and lack of positive affect discriminate between anxiety and depression, as well as factor analyses demonstrating the presence of the three main constructs. Using the Mood and Anxiety Symptom Questionnaire (MASQ), the structure of items lends support to the tripartite model across undergraduate, adult, and clinical populations (Watson et al., 1995).

The tripartite model has been extended into a hierarchical format. This new hierarchical model consists of negative affect and positive affect as higher order factors, with paths that lead to specific diagnoses (Brown et al., 1998; Zinbarg & Barlow, 1996). There are significant pathways from negative affect to mood disorders, GAD, OCD, panic disorder with or without agoraphobia (PDA), and social phobia and significant pathways from positive affect to only

mood disorders and social phobia (Brown et al., 1998). This model also indicates paths from the lower order factor of autonomic arousal to PDA and GAD. The previous view of negative affect as a blanket construct subsuming the anxiety disorders is extended in the hierarchical model through the specification of how positive and negative affect differentially relate to each diagnosis (Barlow et al., 2004).

In further examination of higher order constructs relating to specific anxiety and mood disorders, Brown (2007) assessed outpatients at three time points over a two-year period to investigate the temporal relationship between the disorders and higher order constructs. The results indicated that the covariance in self-reported scores related to GAD, depression, and social phobia was associated with the change in the self-reported measures of neuroticism/negative affect and behavioural inhibition (Brown, 2007). It is possible that the symptoms associated with neuroticism/negative affect and behavioural inhibition were reduced with treatment, which led to a reduction in specific disorder symptoms. However, causal conclusions are not possible due to the correlational nature of the findings. Regardless of the exact causation, the results indicate that a decrease in disorder-related symptom severity is related to a reduction in neuroticism/negative affect and behavioural inhibition (Brown, 2007). These findings are consistent with previous indications of a common construct underlying the anxiety and mood disorders. The existence of a shared construct is the overriding theme from these models. This provides support for the use of a single treatment for multiple disorders that targets a common construct.

Common Vulnerabilities. The constructs underlying anxiety and mood disorders may imply a common vulnerability. As neuroticism/negative affect and extraversion/positive affect are viewed as genetically based dimensions of temperament, they may have a role in the etiology

of anxiety and mood disorders (Brown, 2007). In the study by Brown et al. (1998) analyzing higher order factors and their relation to specific disorders, findings suggested that the higher order constructs were related to the onset of anxious and depressive disorders. Moreover, some research has suggested that a heritable component of neuroticism relates to the development of anxiety (e.g., Hettema, Prescott, & Kendler, 2004). Further evidence of a shared etiology among anxiety and mood disorders is generated from twin studies. Kendler et al. (1987) determined that genes have a non-specific effect in contributing to symptoms of anxiety and depression. This suggests that there is a general genetic component that interacts with an individual's life experiences and contributes to the development of anxiety or depression. Thus, the genetic vulnerability factor is common to both anxiety and mood disorders (Kendler et al., 1987). This finding coincides with theories proposing an underlying construct of negative affect. Kendler and colleagues (1987) also determined that the environment has specific effects on the etiology of anxiety and mood disorders, by determining the specific symptom features that pertain to a particular diagnosis. This suggests that there may be a general genetic vulnerability that is then expressed heterogeneously according to one's experiences.

Similarly, other authors have supported the presence of a common genetic vulnerability among the anxiety disorders. Barlow (2000) suggested that biological and general psychological vulnerabilities relate to the development of GAD and depression, while biological, general psychological and specific psychological vulnerabilities contribute to the development of other anxiety disorders. Though there are some factors that differentiate the specific symptom presentation, it is evident that a shared vulnerability factor contributes to the development of anxious and depressive symptoms.

Utility of Transdiagnostic Group CBT for Anxiety

Efficacy and effectiveness. The paradigms of efficacy and effectiveness are often used to determine if a therapy successfully produces a desired change and can be utilized in clinical practice. The efficacy paradigm refers to whether observed differences are in fact due to the effects of the intervention, while the effectiveness paradigm refers to whether the therapy generalizes to a clinical setting (Erickson, 2003). Treatment efficacy studies therefore analyze the therapy within ideal conditions, such as that of randomized controlled trials (RCTs). Treatment effectiveness studies evaluate the therapy within realistic clinical settings (Gartlehner, Hansen, Nissman, Lohr, & Carey, 2006).

Studies analyzing the effectiveness of transdiagnostic CBT groups have produced encouraging results. An improvement in self-reported anxiety symptoms following GCBT for heterogeneous anxiety groups has been demonstrated in several studies (e.g., Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010; Erickson, 2003; Garcia, 2004; Hooke & Page, 2002; Manning et al., 1994; McEvoy & Nathan, 2007; Norton, 2008; Norton & Hope, 2008; van Ingen & Novicki, 2009). Reduction in depressive symptoms at post-treatment (McEvoy & Nathan, 2007; Norton, Hayes, & Hope, 2004) and maintenance of symptom improvement at 6-month follow up (Ellard et al., 2010; Erickson, 2003; Manning et al., 1994) has also been demonstrated. While numerous studies have indicated symptom improvement following transdiagnostic GCBT, the few studies that used wait-list control groups produced less robust results. Norton and Hope's (2005) study involving 19 participants demonstrated significant symptom improvement in comparison to controls on clinician reports, but there was no improvement on patient self-report questionnaires. A study conducted by Erickson, Janeck, and Tallman (2007) indicated significant improvement in self-reported anxiety severity symptoms post-treatment compared to

the waitlist control group. However, when diagnosis and outcomes were analyzed, it appeared as though only patients with panic disorder experienced significant symptom improvement in comparison to the control group (Erickson et al., 2007). A randomized controlled study of 23 participants with primary anxiety disorders demonstrated significant improvement on self-reported depression symptoms following group CBT (Norton et al., 2004). Though the aforementioned studies have shown symptom improvement in comparison to wait-list control groups, additional studies utilizing control groups are needed to examine the efficacy of transdiagnostic CBT groups.

Currently, there is one study that has directly compared the efficacy of a transdiagnostic CBT group to a disorder-specific CBT group. Norton and Barrera (2012) randomly assigned patients at an anxiety disorder clinic with diagnoses of panic disorder, social anxiety disorder or GAD to either transdiagnostic or diagnosis-specific treatment. There were 23 participants in each of the treatment groups and both treatments consisted of 12 weekly two-hour sessions. Results indicated that there was significant improvement following treatment for both groups, however, the treatment groups did not differ significantly in their scores on self-reported symptom measures, clinician-rated measures, or perception of treatment credibility (Norton & Barrera, 2012). Therefore, some preliminary evidence has been generated to support a similar efficacy of transdiagnostic and disorder-specific treatments for particular anxiety disorders.

The comparable efficacy of transdiagnostic treatment to that of disorder-specific is important in gauging the utility of the treatment. Transdiagnostic CBT is not intended to replace disorder-specific therapy (Clark, 2009), but it is still important to evaluate its efficacy in order to ensure that patients receive a treatment that has been empirically supported. Mansell, Harvey, Watkins, and Shafran (2009) purport that transdiagnostic treatment should not be used if

disorder-specific treatment is just as efficient. As disorder-specific treatments have been thoroughly empirically supported, there is no need to use a transdiagnostic approach if the disorder-specific therapy is available and feasible for the clinic. However, transdiagnostic approaches may be more practical and efficient for some clinical settings. In such a case, this format would be recommended. The utility of transdiagnostic approach largely stems from its greater applicability to the average clinical setting. If its efficacy is supported, then the other benefits associated with a unified approach may make this treatment more practical than disorder-specific treatments in some clinical settings.

Applicability to clinical settings. Rural and general mental health clinics may not have sufficient staff and resources to run different therapy groups for various disorders (Erickson, 2009). Such general clinics that do not specialize in the treatment of particular disorders are likely to have clients with various diagnoses (Clark, 2009; Erickson et al., 2007). The use of diagnostically heterogeneous treatment groups in these settings may promote client access to effective treatment (Erickson et al., 2007), while better suiting the clinic's resources. In fact, Erickson and colleagues (2007) suggest that transdiagnostic groups are more commonly utilized in general mental health clinics since these clinics are not likely to have enough clients with the same anxiety disorder who are available to participate in treatment at the same time. If this heterogeneous group format is commonly used, then it is important for efficacy studies to be examining this format, in order to maximize the generalizability of empirically supported treatments to a clinical setting.

Advantages of a transdiagnostic approach. In addition to its applicability to a clinical setting, transdiagnostic treatment format offers other advantages. Mansell et al. (2009) espouse the use of transdiagnostic CBT for reasons of parsimony and pragmatism. A transdiagnostic

explanation of distress is believed to align with the scientific principle of parsimony, which refers to accepting the simplest explanation when possible (Mansell et al., 2009). Mansell and colleagues also reason that the pragmatic service delivery of a transdiagnostic treatment group supports its use. There are several factors that contribute to the practicality of a transdiagnostic group. Firstly, a unified treatment protocol may be more financially viable than single-service approaches to treatment. Group therapy in general is often cost-effective since numerous clients are receiving treatment at once and only one manual is needed (Clark, 2009). It can be very costly for a mental health centre to have numerous therapy manuals and several clinicians trained in the administration of each manual, which would be necessary for disorder-specific CBT (Norton & Hope, 2005).

Secondly, transdiagnostic CBT is practical for its role in enhancing participation in therapy. The group format may increase the availability of treatment (Clark, 2009) and thereby reduce waiting list periods (McEvoy et al., 2009). Time is also saved by not having to find a treatment that is specific to the individual's symptom presentation (Mansell et al., 2009). Additionally, Clark (2009) asserts that the broad nature of these protocols may be less ominous to clients who are hesitant about participating in therapy.

Thirdly, a transdiagnostic approach may be considered pragmatic for its ability to address comorbidity. This may be particularly advantageous, since comorbidity can pose difficulties regarding treatment response and implementation. Regarding treatment response, Coryell et al. (1988) reported that patients with panic disorder and major depression are less likely to recover over a two-year period than those without the comorbid diagnosis. As such, consideration of co-occurring anxiety and mood disorders during the facilitation of treatment is warranted. Despite the significance of comorbidity, randomized controlled trials investigating

diagnosis-specific protocols often use participants who have one diagnosis (McManus et al., 2010). If the empirically supported treatment has not been used with comorbid presentations, then the clinician is faced with a difficult task of deciding how to proceed when a client presents with comorbidity. The clinician may use the intervention designed for the primary diagnosis with the hope that it also improves other symptoms, or a clinician may use one intervention after another to target each diagnosis or one may combine components from various protocols (McManus et al., 2010). While using a diagnosis-specific intervention could simultaneously treat an alternate diagnosis, the likelihood of this is uncertain. Studies have indicated that the comorbid diagnosis usually remains after an intervention targeting a primary diagnosis is administered (Allen, Ehrenreich, & Barlow, 2005; Tsao et al., 2002). A further disadvantage is that the use of multiple treatments uses more resources (McManus et al., 2010). It is also problematic to combine components from different protocols due to the lack of research indicating how to do so. Moreover, combining treatment interventions has been demonstrated to weaken the efficacy of the interventions (McManus et al., 2010). Evidently, the co-existence of various anxiety and mood disorders poses difficulties for treatment implementation when using diagnosis-specific empirically supported treatments. A transdiagnostic approach may alleviate some of these difficulties, as the broad treatment protocol is designed to address various disorders and residual symptoms.

Further diagnostic issues may be addressed with the transdiagnostic approach. When clients do not meet criteria for a disorder that corresponds to a specific treatment model, such as a diagnosis of anxiety disorder not otherwise specified, a transdiagnostic approach offers a way to provide evidence based treatment (Mansell et al., 2009). Since determination of a primary anxiety diagnosis is not necessary to for transdiagnostic CBT, this may also enhance treatment

availability (Clark & Taylor, 2009). The deviation away from linking a specific disorder to a specific treatment might contribute to shifting the clinical focus onto the individual patient. Mansell and colleagues suggest that transdiagnostic treatment may promote the use of an idiographic approach, as clinicians would focus on how maintaining processes are operating for each individual. A disorder-specific protocol may be more structured and so the unique processes within each individual may be less of a focus (Mansell et al., 2009).

The transdiagnostic approach to treatment appears to follow the principles of parsimony and pragmatism, while posing advantages over single-service treatments such as the greater cost-effectiveness, increased therapy participation, and a greater ability to address comorbidity. These advantages may also promote the dissemination of empirically supported CBT.

Disadvantages of a transdiagnostic approach. Despite the numerous benefits offered by a transdiagnostic approach to treatment implementation, some disadvantages persist. McEvoy et al. (2009) caution that group cohesiveness could be hindered due to the heterogeneous composition of the group, as clients may be less able to relate to one another and to learn from one another. This could have negative effects on therapy outcomes (McEvoy et al., 2009). Additionally, treatment that is broad may be less efficacious in reducing anxiety symptoms than therapies focusing on a specific, primary disorder (Craske et al., 2007). Another disadvantage is the uncertainty regarding how transdiagnostic a transdiagnostic treatment should be (Mansell et al., 2009). For example, transdiagnostic treatment could be designed for anxiety disorders or all Axis I disorders. Currently, the former approach is utilized. However, the balance between using a treatment that is most practical and that targets common features and mechanisms could have unclear boundaries. Despite these disadvantages, a transdiagnostic approach still has clinical utility due to its feasibility, cost-effectiveness, ability to address

comorbidity and ability to enhance therapy participation and dissemination of evidence-based treatment. The disadvantages merit careful consideration, as the most efficacious treatments should be provided to clients. Research regarding the efficacy and effectiveness of transdiagnostic CBT has been promising thus far, which supports the use of this approach.

Combining transdiagnostic and disorder-specific approaches. Rather than comparing the efficacy of disorder-specific and transdiagnostic protocols, some researchers have suggested a combined use of these formats. Clark (2009) has proposed using transdiagnostic CBT as a relapse prevention program that clients participate in after undergoing individual therapy. Alternatively, patients could participate in transdiagnostic CBT initially to prevent the occurrence of comorbid symptoms (Dozois, Seeds, & Collins, 2008). The multiple potential uses of a transdiagnostic treatment group reinforce the need for this therapy approach to be rigorously evaluated in order to determine how it can be most beneficial for patients.

Mediators and Moderators of Therapy Outcomes

Though previous studies have supported the efficacy and effectiveness of heterogeneous treatment groups, it is less certain how the symptom reduction occurs. Gaining a better understanding of how a treatment exerts its effects is critical to formulating effective protocols and to understanding the nature of disorders. Kazdin (2007) has asserted that treatment mechanisms can begin to be understood by first exploring mediation. Identifying variables that account for the reduction in anxiety and depression symptoms following treatment will provide insight as to how a transdiagnostic approach works. Very few studies have examined mediators of symptom change in a diagnostically heterogeneous GCBT. Accordingly, several authors have advocated the need for future studies to examine the mechanisms of change within transdiagnostic CBT (Clark, 2009; Mansell et al., 2008; McEvoy et al., 2008). Dozois et al.

(2009) asserted that examination of transdiagnostic CBT may further elucidate the common processes among anxiety and mood disorders.

Cognitive change. Change in cognitive processes is often considered the basis of CBT outcomes. Despite the centrality of cognitive change to CBT, it can also be achieved through other therapies (Chambless & Gillis, 1993). Some theories in the literature attempting to explain the role of cognitive change in CBT have suggested that a change in cognitions may act as a mechanism of change within the therapy (Bandura, Adams, & Beyer, 1977). It has also been suggested that cognitions, anxiety, and avoidance may interact, causing a change in one to lead to a change in another (Chambliss & Gillis, 1993). However, further research is needed to elucidate the relationship between cognitive change and CBT outcomes (Chambliss & Gillis, 1993).

Studies exploring the role of cognitions in contributing to CBT outcomes have primarily focused on specific anxiety disorders. Cognitive change following CBT has been indicated among patients with GAD, social phobia, and panic disorder with or without agoraphobia, and the cognitive change has been associated with symptom reduction (Chambless & Gillis, 1993). Wells (1995) proposed that maladaptive cognitions such as negative appraisals of worry or beliefs about worry uncontrollability can maintain pathological worry. Several models of generalized anxiety disorder (GAD) recognize the role of cognitive factors in the maintenance of worry (e.g., Dugas, Gagnon, Ladouceur, & Freeston, 1998; Wells, 1995). Worry has also been examined as a mechanism of change among individuals with GAD. Donegan and Dugas (2012) found that a change in worry and a change in somatic anxiety are related in both CBT and Applied Relaxation (AR). Since worry can be present among individuals with other anxiety

disorders, the relationship between change in worry and outcomes following CBT across the anxiety disorders warrants further study.

Additionally, specific cognitions of dysfunctional attitudes have been investigated as a mechanism of change in CBT across various anxiety disorders. Beck and colleagues (Beck, 1983; Beck, Rush, Shaw, & Emery, 1979) have proposed the cognitive mediation hypothesis, suggesting that a causal relationship exists between dysfunctional attitudes and depression and anxiety. However, a study conducted by Burns and Spangler (2001), found that dysfunctional attitudes did not mediate CBT outcomes for anxiety. Though evidence for mediation was not found, dysfunctional attitudes and therapy outcomes were correlated (Burns & Spangler, 2001). As such, it is evident that a cognitive component relates to CBT outcomes across various anxiety disorders, but it does not necessarily account for symptom change. Despite the theoretical emphasis on cognitions as a mechanism of change in CBT, studies have yet to produce consistent results on the role of cognitive change.

Intolerance of uncertainty. Intolerance of uncertainty (IU) is another cognitive component that has been examined as a maintaining factor among anxiety and depressive disorders. Intolerance of uncertainty is a cognitive bias in which ambiguity or an unknown, possibly adverse future event is considered to be negative and causes distress for the individual (Ladouceur, Talbot, & Dugas, 1997; Koerner & Dugas, 2008). IU has been demonstrated to be a vulnerability factor for worry (Sexton et al., 2003), and to predict social anxiety severity (Boelen & Reijntjes, 2009), symptoms of panic disorder and agoraphobia (McEvoy & Mahoney, 2011), depressive symptoms (McEvoy & Mahoney, 2011; Miranda, Fontes, & Marroqui'n, 2008), GAD and OCD symptoms (Fergus & Wu, 2010). Additionally, IU has been demonstrated to mediate the relationship between neuroticism and symptoms of various anxiety disorders and depression,

with a particularly strong influence on worry (McEvoy & Mahoney, 2012). IU appears to be a construct that is associated with anxiety and mood disorders. Though associations between IU, anxiety and depression have been established, it is unclear how targeting IU in therapy affects therapy outcomes for each of the anxiety and mood disorders. Studies examining treatment outcomes have indicated that IU is related to symptom improvement following CBT for GAD (Dugas & Ladouceur, 2000) and social phobia (Hewitt, Egan, & Rees, 2009) as well as for OCD following an exposure and response-prevention program (Overton & Menzies, 2005). These findings indicate promising potential for the role of IU, but there is need to further validate the relationship between IU and psychotherapy outcomes across various anxiety and mood disorders. McEvoy and Mahoney (2012) have asserted that there is a need for research to compare IU as a mediator of symptom change to other mediators in order to clarify whether IU has a unique role in contributing to positive outcomes. Overall, there is a dearth of research examining cognitive mediation of CBT outcomes for anxiety disorders and research that has been generated thus far has largely focused on symptom change for a particular disorder. To thoroughly evaluate transdiagnostic CBT, the mechanisms within this therapy approach need to be examined.

Homework compliance. Engagement in therapy has also been examined as a mediator of symptom change in mixed-anxiety CBT groups. In their study of CBT for a transdiagnostic anxiety disorder group, Westra et al. (2007) found that the relationship between expectancy for change and post-treatment outcome was mediated by homework completion. Their analyses also indicated that the relationship between homework completion and post-treatment outcome was mediated by initial cognitive symptom change (Westra, Dozois, & Marcus, 2007). Therefore, homework compliance is related to expectancy for change and early symptom improvement but it does not uniquely account for positive outcomes.

The relationship between therapy outcomes and homework compliance has been analyzed across various psychotherapies and disorders. Mausbach, Moore, Roesch, Cardenas, and Patterson (2010) conducted a meta-analysis of 23 studies conducted since 2000, and they found a significant relationship between greater homework compliance and improved psychotherapy outcomes for depressive, anxious, and substance use symptoms. The authors suggest that homework compliance relates to positive outcomes as it facilitates the practice of skills taught in therapy (Mausbach, 2010). Greater homework compliance has been related to symptom improvement following CT and CBT for patients with major depressive disorder (Bryant, Simons, & Thase, 1999; Burns & Nolen-Hoeksema, 1991). However, some contradictory findings have also been produced. Neimeyer, Kazantzis, Kassler, Baker, and Fletcher (2008) analyzed depressive symptoms following CBT and determined that homework compliance did not predict symptom change. Though homework compliance alone was not a significant predictor in this study, the combined effects of homework compliance, willingness to complete homework, and cognitive skill acquisition predicted depressive symptom change (Neimeyer et al., 2008). These results indicate that the influence of homework compliance may be part of a greater construct such as therapy engagement.

Studies examining the relationship between homework compliance and therapy outcomes for anxiety disorders have also produced results that do not support the findings of Mausbach et al. (2010). Homework compliance was not related to improved outcomes following CBT for patients with social anxiety (Woody & Adessky, 2003) and panic disorder (Schmidt & Woolaway-Bickel, 2000). The lack of consistency regarding the role of homework compliance in the literature may be related to the variety of methodologies used, as homework compliance ratings may be completed by patients or therapists at various points in the therapy process.

Therefore, there is a need to further explore the role of homework compliance in contributing to therapy outcomes for anxiety disorders. As the study of transdiagnostic CBT for anxiety is in its infancy, it would be useful to gain an understanding of how engagement in therapy homework contributes to symptom change at post-treatment.

The Present Study

The present study examined patient outcomes following transdiagnostic GCBT for anxiety symptoms at St. Joseph's Care Group in Thunder Bay to determine if this approach is effective and to gain a better understanding of how this therapy works. These analyses will contribute to the understanding of whether a transdiagnostic approach is effective in treating anxiety symptoms and to the understanding of the mechanisms by which CBT exerts its effects. This study extends previous literature by elucidating the role of intolerance of uncertainty as a transdiagnostic construct and by clarifying the role of cognitions in contributing to outcomes following a transdiagnostic CBT protocol.

Hypotheses

The primary aim of the present study was to evaluate the efficacy of a transdiagnostic GCBT protocol. This study also aimed to identify variables that contribute to symptom improvement. Specifically, cognitive change and homework compliance were examined as mechanisms that influence treatment outcome.

H1: Participants were expected to experience significant symptom improvement at post-treatment on anxiety measures. As the current literature supports the efficacy of a transdiagnostic group CBT for anxiety disorders, anxiety symptoms were predicted to improve at post-treatment.

H2: It was hypothesized that participants would experience significant symptom improvement at post-treatment on depression measures. Since anxiety and mood disorders may share a common underlying construct such as negative affect (Clark & Watson, 1991), treatment that affects the underlying construct is expected to influence both anxious and depressive symptoms. Furthermore, transdiagnostic CBT for anxiety has been shown to reduce co-occurring mood symptoms (Norton et al., 2004). As such, participants receiving the treatment were expected to demonstrate significant reduction in depressive symptoms.

H3: It was hypothesized that early cognitive change would predict late symptom change. Following the theoretical premise of CBT and evidence of an association between cognitive change and treatment outcomes for various anxiety disorders (Chambless & Gillis, 1993), it was expected that early cognitive change would be associated with overall symptom change.

H4: It was hypothesized that overall cognitive change would account for the change in Beck Anxiety Inventory (BAI) scores for the treatment group. In accordance with Kazdin's (2007) recommendation to analyze multiple mediators, three measures of cognitions were examined as mediators. Changes in measures of general anxiety and depression-related cognitions were expected to mediate symptom outcomes. As CBT is based on the premise that cognitive change acts as a mechanism in therapy, the measure of general cognitions was expected to have a mediating role. Change in intolerance of uncertainty (IU) is another cognition that was expected to mediate the relationship between CBT and symptom change. The recognition of IU as a transdiagnostic construct and the documented correlation between IU and positive outcomes across disorders (Dugas & Ladouceur, 2000; Hewitt et al., 2009; Overton & Menzies, 2005) suggested that IU could have a causal role in affecting symptom change. Lastly, change in worry was examined as a mediator. Change in worry has been related to CBT and to a change in

anxiety symptoms (Ladouceur et al., 2000). As such, change in worry symptoms was expected to mediate the relationship between CBT and overall anxiety symptom change. However, statistical indication of mediation does not necessarily indicate that the variable is a mediator since it is unknown whether the cognitive change precedes the symptom change (Kazdin, 2007).

H5: It was hypothesized that homework compliance would moderate the relationship between CBT and symptom change. Completing homework assignments was expected to influence symptom change over the course of treatment, as some previous research has shown homework completion to be related to enhanced outcomes (e.g., Bryant, Simons, & Thase, 1999; Burns & Nolen-Hoeksema, 1991).

Method

Participants

This study consisted of participants attending a transdiagnostic anxiety CBT group at St. Joseph's Care Group in Thunder Bay, Ontario. Clients were referred to the therapy group by an intake clinician or therapist if they were experiencing a high level of anxiety symptoms. The data collection period spanned from June 2013 to July 2014 in order to maximize the sample size, as an a prior power analysis for multiple regressing using G*Power 3.0.10 (Faul, Erdfelder, Lang, & Buchner, 2007) suggested a sample size of $N = 50$ to detect a large effect size, and a sample size of $N = 108$ to detect a medium effect size. Throughout this data collection period, the group was offered at three times: summer 2013, and winter and spring of 2014. However, there was no complete participation from the summer 2013 group, and a different therapy manual was used beginning in fall 2013, so any partial data from the summer 2013 group was not included in the present study. Two therapy groups ran simultaneously during winter 2014,

and then spring 2014, so the data in the present study was collected from four therapy groups in total.

Procedure

Data was collected from the therapy groups at three time points: pre-, mid-, and post-treatment. The group facilitator introduced the study at end of the first therapy session, and then all potential participants were given a package to take home with them that included an information letter (Appendices A-C) and self-report questionnaires. A drop-box was left in the waiting room for people to discard their package anonymously if they did not want to participate. The questionnaire packages also included a ballot for participants to complete and mail separately to the researchers if they wished to receive a gift card to thank them for their participation. Two pre-addressed stamped envelopes were included in the packages for participants to mail both the completed questionnaires and a ballot to the researchers. Another package of self-report questionnaires was given to clients at the end of the fourth therapy session and the end of the last session, with participants again being asked to mail their responses and ballots back to the researchers. Therefore, data was collected from some clients in the treatment group at approximately the beginning, middle, and end of treatment.

At each assessment time-point, the group facilitator notified participants of the study using the scripts presented in Appendix D. Some of the self-report measures used in the study were administered during treatment sessions for separate program evaluation purposes, instead of being included in the questionnaire packages. A self-generated code was used to track participants' responses across time, and to match the measures submitted during sessions to those submitted by mail. This process was explained to clients using the script outlined in Appendix D.

Data collection from a wait-list control group had been intended, but was not possible due to the removal of the wait-list. Program changes were made at St. Joseph's Care Group in fall 2013, whereby a wait-list no longer existed. Instead, two therapy groups were facilitated simultaneously so that all referred clients could be offered treatment and would not need to wait until the following therapy group to receive services.

Measures

To measure symptomatology, cognitions, and homework compliance, a number of instruments were chosen based on their psychometric properties and use in previous research. All measures were completed at all three time points, with the exception of the homework measure, which was assessed twice. The packages of self-report measures included the Beck Anxiety Inventory (BAI), Beck Depression Inventory-II (BDI-II), Penn State Worry Questionnaire (PSWQ), Positive and Negative Affect Schedule (PANAS), Intolerance of Uncertainty Scale (IUS-12), the Cognitions Checklist (CCL), and a Homework Compliance measure that was completed at mid- and post-treatment. A demographic questionnaire (Appendix E) was also administered to participants at each time-point.

Beck Anxiety Inventory. The Beck Anxiety Inventory (BAI) was administered to assess anxiety symptoms. This is a self-report questionnaire that consists of 21 items measuring anxiety symptomatology (Beck & Steer, 1993). The BAI uses a 4-point Likert-type scale where participants rate the frequency to which they have experienced each symptom in the past month, ranging from a rate of 0 for "Not at all" to 3 for "Severely – it bothered me a lot." The BAI has been factor analyzed into two components of somatic symptoms and cognitive symptoms (Borden et al., 1991; Hewitt & Norton, 1993). High internal consistency (Cronbach's alpha = .94) of the BAI has been demonstrated among a sample of outpatients with anxiety disorders

(Fydrich, Dowdall, & Chambless, 1992). Among a non-clinical sample of undergraduate students, the BAI was demonstrated to have high internal consistency (Cronbach's alpha = .90), a moderate test-retest correlation (.62), and discriminant and convergent validity were supported through low and moderate correlations to the Beck Depression Inventory and State Trait Anxiety Inventory, respectively (Creamer, Foran, & Bell, 1995). On this measure, scores that range from 8-15 reflect mild anxiety, while scores of 16-25 indicate moderate anxiety and scores of 26-63 indicate severe anxiety (Beck & Steer, 1990). These scores are overall estimates of the individual's anxiety symptom severity level (Beck & Steer, 1990).

Beck Depression Inventory – II. The BDI-II (Beck, Steer, & Brown, 1996) was administered to assess symptoms of depression, which commonly co-occur with symptoms of anxiety. This is a 21-item self-report scale that measures clinical symptoms of depression. Participants rate the frequency with which they have experienced each symptom in the last two weeks on a 4-point Likert-type scale. The internal consistency of the BDI-II has been demonstrated by high alpha coefficients of .91 (Dozois, Dobson, & Ahnberg, 1998) and .90 (Osman et al., 1997) among non-clinical samples of young adults and with a high alpha coefficient (Cronbach's alpha = .91) among psychiatric outpatients **(**Beck, Steer, Ball, & Ranieri, 1996). Reliability of the BDI-II has been further supported through a significant test-reset correlation of .93 (Beck et al., 1996). The convergent validity of the BDI-II has been supported through positive correlations with the Beck Hopelessness Scale and the Scale for Suicide Ideation, while discriminant validity has been indicated by a low correlation with the Hamilton Rating Scale for Anxiety (Beck et al., 1996). Higher scores on the BDI-II indicate a higher presence of depressive symptoms (Beck et al., 1996).

Positive And Negative Affect Schedule. The 20-item Positive And Negative Affect Schedule (PANAS; Appendix F) was administered to assess mood states. This scale consists of 10 items measuring Positive Affect, which is the extent to which a person feels energetic and alert and there are 10 items measuring Negative Affect, which is the experience of unfavorable mood states. Participants rate the extent to which they have experienced positive affect mood states such as "inspired" and negative affect mood states such as "distressed" within the past few weeks, using a 5 point Likert-type scale ranging from "very slightly or not at all" to "extremely" (Watson et al., 1988). Higher scores on the Positive Affect scale indicate a higher presence of positive affect, while higher scores on the Negative Affect scale indicate greater negative affect (Watson et al., 1988). The independence of the positive affect and negative affect subscales is supported by the low inter-correlations ranging from -.12 to -.23 (Watson et al., 1988). Reliability and validity of the PANAS have also been demonstrated for various time intervals of experienced mood states (Watson et al., 1988).

Intolerance of Uncertainty Scale. The Intolerance of Uncertainty Scale – Short Form (IUS-12; Appendix G) was administered to assess participant's cognitions. This is a 12-item scale that measures reactions to uncertain events (Carleton, Norton, & Asmundson, 2007). The IUS-12 uses a 5 point Likert-type scale ranging from 1 for "not at all characteristic of me" to 5 for "entirely characteristic of me" and total scores range from 1 to 60. Higher scores on this scale reflect higher levels of intolerance of uncertainty (Buhr & Dugas, 2002). A study analyzing the reliability of the IUS-12 for clinical and non-clinical samples demonstrated Cronbach's alpha coefficients of .87 and .92, respectively (Khawaja, 2010).

Penn State Worry Questionnaire - The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990; Appendix H) was administered to assess worry

symptoms. This is a 16-item questionnaire that uses a 5-point Likert-type scale to assess how typical each worry trait is of the participant. Higher total scores on the PSWQ indicate higher levels of pathological worry. The PSWQ has been demonstrated to have high internal consistency and convergent validity among a clinical anxiety disorders sample (Brown, Antony, & Barlow, 1992). In a sample of undergraduate students, high internal consistency was reported (Cronbach's alpha = .93) and convergent and discriminant validity were supported (Meyer et al., 1990).

Cognitions Checklist. The Cognitions Checklist (CCL; Appendix I) is a 26-item measure that assesses the frequency of automatic thoughts related to depression and anxiety (Beck, Brown, Steer, Eidelson, & Riskind, 1987). The CCL contains an anxious cognition subscale (CCL-A), consisting of 12 items and a depressive cognition subscale (CCL-D) with 14 items. A high score on the CCL-A reflects the presence of cognitions that are oriented towards the future and related to uncertainty, which are cognitions that are associated with anxiety disorders. On the CCL-D scale, a higher score indicates the presence of cognitions oriented towards the past or cognitions regarding a negative view of the future, which are associated with depressed mood. Internal consistency has been demonstrated for both the CCL-A and CCL-D with alpha coefficients of .90 and .92, respectively (Beck et al., 1987). Convergent and discriminant validity has been supported through correlations with the Hamilton Anxiety Scale-Revised and the Hamilton Depression Scale Revised. The CCL-A and CCL-D are designed to measure cognitions associated with anxiety and depression, respectively. As such, criterion validity has been supported by discriminating between patients with DSM-III diagnoses of anxiety and depression (Beck et al., 1987).

Homework Compliance. Participants were asked to indicate how often they completed

the therapy homework by selecting one of four options that ranged from "I completed the homework every week" to "I never completed the homework" (Appendix J).

Description of the Transdiagnostic Anxiety Treatment

Clients referred to the mixed-anxiety CBT group attended the group once a week for 2 hours over an 8-week period. The CBT group therapy was a manualized CBT group program facilitated by a psychologist and clinical psychology or social work graduate students. The groups were typically composed of 10-13 clients. Some of the material covered throughout the therapy included: psychoeducation, relaxation strategies, discussion of anxiety maintaining factors, exposure, challenging unhelpful thoughts, mindfulness, and homework assignments. A more detailed outline of the core components covered in each session is presented in Table 1.

Table 1

Outline of Material Covered in the Transdiagnostic GCBT for Anxiety

Session Number	Components Covered
1	Introductions, review of group rules and confidentiality, discussion of "what is anxiety", introduction to the CBT model of anxiety, abdominal breathing practice, introduction to tracking cards, homework assignment
2	Homework discussion, review of breathing technique, review of anxiety symptoms and how they relate to treatment targets, psychoeducation on tension, progressive muscle relaxation, homework assignment
3	Homework review, discussion of behaviours and advantages/disadvantages of maintaining anxiety, motivational interviewing, psychoeducation on role exposure, exposure hierarchy, homework assignment
4	Homework review, psychoeducation on beginning exposure tasks, review of exposure diary, autogenic relaxation, homework assignment
5	Homework review, psychoeducation on exposure to internal sensations, discussion of anxiety-related thoughts and unhelpful thinking styles, homework assignment
6	Homework review, introduction to managing unhelpful thoughts, psychoeducation on changing and analyzing thoughts, thought diary, relaxation, homework assignment
7	Homework review, psychoeducation on mindfulness and postponing worry, homework assignment
8	Homework review, discussion of anxiety symptoms and strategies for each symptom, conclusions to the treatment and scheduling of follow-up appointments

Treatment Fidelity

Adherence to the therapy manual was assessed with a checklist after each session that was completed by the group facilitator. The checklist (Appendix K) contained the list of components to be covered in that session and a 4-point rating scale to assess the order in which the components were covered, which ranged from "the session rarely followed the treatment protocol" to "the session followed the treatment protocol". Overall adherence to the manual was high. Of all the sessions assessed ($N = 32$), 231 out of the 240 listed components were covered

in the session that the manual specifies. Nine sessions (28.1%) were rated to mostly follow the treatment protocol, while 23 sessions (71.9%) were rated as following the treatment protocol. Thus, none of the sessions were rated as rarely following the protocol or somewhat following the protocol.

Statistical Analyses

All statistical analyses were completed using SPSS 21 for Macintosh. Descriptive statistics were used to depict the sample's demographic characteristics, symptoms, and cognitive scores for each time of measurement. Paired t-tests were conducted to compare the means on the BAI, BDI-II, PANAS-PA, and PANAS-NA across the three assessment time points.

Three change scores were computed for each of the outcome and cognitive measures by subtracting the pre-treatment scores from the mid-treatment scores ("early change"), subtracting the mid-treatment scores from the post-treatment scores ("late change"), and subtracting pre-treatment scores from post-treatment scores ("overall change"). The relationships between the change scores on cognitive and symptom measures were investigated using Pearson correlations. Regression analyses were conducted to examine if early cognitive change predicted late symptom change and hierarchical regression was used to determine if cognitive change mediated symptom change. The mediation model consisted of post-treatment BAI scores as the dependent variable, pretreatment BAI scores entered in the first step, demographic predictors were entered at the second step, and overall change scores on the cognitive measures entered at the third step. This model is depicted in Figure 1. Finally, correlations between homework compliance scores and symptom change scores were examined to determine if homework compliance was a moderator of anxiety symptoms.

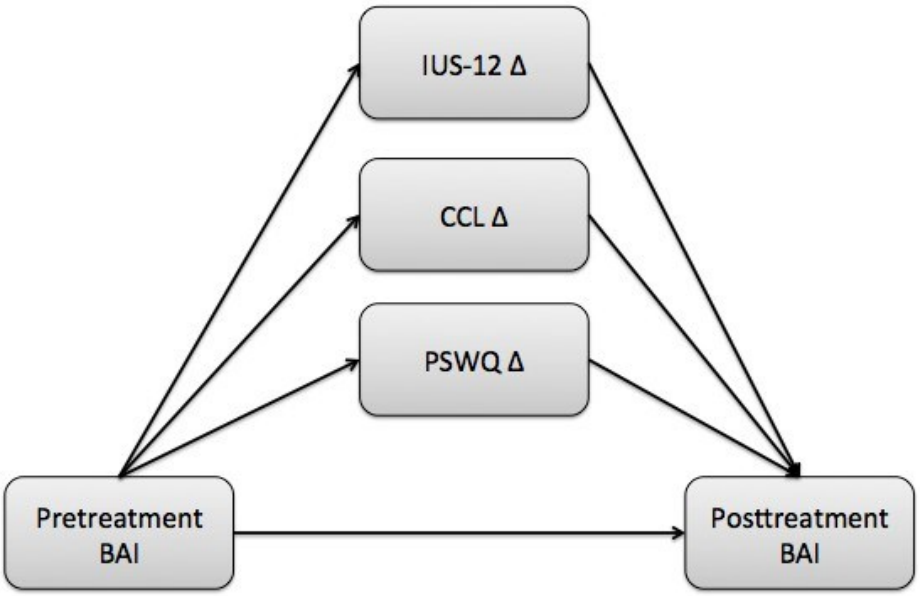

Figure 1. Model investigating cognitive change as a mediator of treatment outcome

Results

Participants

Data were collected from four transdiagnostic anxiety treatment groups that ran between January 2014 and July 2014 at St. Joseph's Health Centre. The sample for this study consisted of 15 participants who were attending one of the groups. A total of six participants completed the questionnaires at all three time-points. The demographic characteristics of the participants are outlined in Table 2.

Table 2

Demographic Characteristics *of the Total Sample*

	Participants ($N = 15$)		
	***M* (*SD*)**	**Frequency**	**%**
Age	45.07 (10.81)		
Sex			
Male		3	20.0
Female		12	80.0
Ethnicity*			
White/Caucasian/European		14	93.3
Aboriginal/African-Canadian		3	20.0
Marital Status			
Married/common-law		7	46.7
Never married		4	26.7
Separated		2	13.3
Divorced		2	13.3
Income			
Below $20,000		5	33.3
$20,000 - $40,000		4	26.7
$40,000 - $60,000		2	13.3
$60,000 - $80,000		3	20.0
$100,000 or above		1	6.7
Employment Status			
Work full-time		3	20.0
Work part-time		2	13.3
Retired		1	6.7
Do not work		9	60.0
Received Diagnosis			
Yes		11	73.3
No		2	13.3
Missing/Unknown		2	13.3
Type of Diagnosis*			
Anxiety		5	33.3
PTSD		4	26.7
Depression		6	40.0
Bipolar Disorder		1	6.7
Borderline Personality Disorder		2	13.3
Learning Disability		1	6.7
Receiving Another Treatment*			
No		3	20.0
Yes		12	80.0
Medication		10	66.7
Individual Tx		10	66.7
Group Tx		3	20.0
Other		3	20.0

Note. Tx = Treatment. Individual and group treatment refers to receiving other therapy or counselling in individual or group formats, at the same time as the transdiagnostic group
* non-exclusive.

Data Screening

The data was screened prior to analysis using IBM SPSS programs. Following the recommendations of Tabachnick and Fidell (2013), the data was checked for accuracy, missing values, normality, multicollinearity, and outliers. All descriptive statistics appeared to be within expected ranges. Variable skewness and kurtosis was not significant enough to warrant variable transformations. Missing Values Analysis (MVA) was conducted to examine the missing patterns among the data, and Little's Missing Completely At Random test indicated that the data was not missing completely at random, $^{2}(2901) = 12{,}000{,}819.983$, $p < .001$. Most of the missing data was due to participant drop-out (drop-out from the study – not necessarily the therapy group), and complications matching the mailed measures to the measures completed in the therapy room. Twelve items in the dataset had been left blank or were skipped by participants. Mean imputation was used to replace these 12 missing values. The Pearson product-moment correlations between all of the scale totals (as presented in Table 3) were examined for multicollinearity. At Time 2 the IUS-12 and PANAS-NA scores were very highly correlated, $r = .96$, $p < .001$, while the Time 3 scores on the PANAS-NA and the BAI were also high, $r = .91$, $p < .01$. This suggests a high degree of relatedness among these constructs. Lastly, the data were searched for outliers. No univariate outliers were detected from an analysis of z scores. Mulivariate outliers were searched for among the variables used in the regression analyses, and none were identified with Mahalanobis distance at a criterion of $p < .001$.

Differences between individuals who provided complete data and those who did not (non-completers) were examined using independent sample *t*-tests. Non-completers had significantly higher scores on the BDI-II (15 point difference) and CCL (25 point difference) at

pre-treatment. No other significant differences were noted. In order to maximize the available sample size, pair-wise deletion was used for each analysis.

Table 3

Correlations Between Cognitive and Symptom Measures at Pre-, Mid-, and Post-Treatment

	Pre-treatment			**Mid-treatment**			**Post-treatment**		
	IUS-12	CCL	PSWQ	IUS-12	CCL	PSWQ	IUS-12	CCL	PSWQ
Pre-treatment									
BAI	.25	.69**	.44	.54	.20	.04	.13	.14	.20
BDI-II	.47	.82**	.64*	.60	.41	.15	.32	.18	.05
PANAS-PA	-.21	-.26	.03	.32	.07	.39	.27	.16	.37
PANAS-NA	.33	.63*	-.02	.32	.62**	.31	.52	.68*	.32
Mid-treatment									
BAI	-.40	.10	.18	.41	.20	.16	-.06	.05	.18
BDI-II	.69	.60	.17	.83*	.83*	.70	.81*	.67	.61
PANAS-PA	-.14	.12	.30	-.06	.13	.31	-.01	.24	.09
PANAS-NA	.17	.62	.43	.62*	.50	<-.01	.39	.36	.40
Post-treatment									
BAI	.10	.54	.24	.64	.35	.36	.42	.46	.65
BDI-II	.50	.36	.15	.74*	.84*	.76	.87**	.78*	.81**
PANAS-PA	-.39	-.08	.11	-.37	-.24	.07	-.28	-.28	-.45
PANAS-NA	.02	.50	.25	.55	.56	.50	.47	.65	.74*

Note. Correlations were conducted using pair-wise deletion, so the sample size contributing to each bivariate correlation differs.
* $p < .05$

Descriptive Statistics

The means and standard deviations of the total score on each scale at pre-, mid-, and post-treatment are presented in Table 4. In terms of pre-treatment distress, participants' scores fell in the "severe" range on both the BAI and BDI-II. With the exception of the BAI from Time 2 to Time 3, and the PANAS-PA from Time 1 to Time 2, the means changed in the expected directions over the course of the GCBT. Cronbach's alpha ranged from .80 to .97 (see Table 5) at each time point, indicating good internal consistency. However, alpha values for the BAI at Time 1 and Time 3, the IUS-12 at Time 3, and the CCL at Time 3, were greater than .95. This may indicate some redundancy among the items (Tavakol & Dennick, 2011) or may be due to the small sample size.

Table 4

Means and Standard Deviations of Scale Totals across Treatment

Measure	Pre-Treatment			Mid-Treatment			Post-Treatment		
	M	***SD***	***n***	***M***	***SD***	***n***	***M***	***SD***	***n***
IUS-12	42.73	9.37	15	42.09	10.20	11	36.78	9.47	9
CCL Total	81.17	18.07	15	74.64	23.93	11	71.28	28.56	9
CCL-A	35.33	10.08	15	34.36	10.98	11	31.50	13.78	9
CCL-D	45.84	11.56	15	40.27	15.07	11	39.78	17.29	9
PSWQ	63.31	9.21	13	62.33	12.24	6	62.00	11.76	9
BAI	29.85	16.72	13	24.00	12.37	7	24.57	17.07	9
BDI-II	30.34	12.53	13	26.00	13.45	7	22.33	14.30	9
PANAS-PA	24.40	7.94	15	25.76	7.71	11	22.99	10.06	9
PANAS-NA	33.07	7.66	15	29.72	6.10	11	26.28	7.75	9

Table 5

Reliability of the Measures at Each Time Point

Time 1	**Cronbach's α**	**Time 2**	**Cronbach's α**	**Time 3**	**Cronbach's α**
IUS-12	.90	IUS-12	.91	IUS-12	.96
CCL	.92	CCL	.95	CCL	.97
PSWQ	.83	PSWQ	.89	PSWQ	.89
BAI	.97	BAI	.92	BAI	.97
BDI-II	.91	BDI-II	.93	BDI-II	.95
PANAS-PA	.92	PANAS-PA	.93	PANAS-PA	.95
PANAS-NA	.84	PANAS-NA	.80	PANAS-NA	.82

Hypotheses 1 and 2

Paired t-tests were conducted to evaluate whether symptom improvement was significant over the course of treatment. Anxiety symptom improvement was first examined with a paired samples t-test that compared whether the means of BAI total scores differed significantly from pre-to mid-treatment, mid- to post-treatment, and pre- to post- treatment. These comparisons were not significant, suggesting that anxiety symptoms did not improve significantly among the individuals included in the analysis. Paired t-tests were conducted in the same manner to compare the means of the mood outcome variables (BDI-II, PANAS-PA, and PANAS-NA) across the different time points, with. Again, none of the t-tests were significant. Contrary to predictions, the anxiety and mood symptoms did not appear to improve significantly over the course of GCBT.

Hypothesis 3

To examine whether early cognitive change predicts late symptom change, correlations among the change scores were first examined. As can be seen in Table 6, the early cognitive change scores were not significantly correlated with the late symptom change scores. However,

early cognitive change on the CCL and PSWQ were positively and significantly correlated with early change on the BDI-II, while early change on the IUS-12 was significantly correlated with early change on the PANAS-NA. The relationships between overall change on all measures, and early and late changes, are outlined in Tables 7 and 8.

Subsequent regression analyses were conducted where early cognitive change scores (on the IUS-12, CCL, and PSWQ) were entered simultaneously as the predictors, and the late change in a single symptom outcome measure was the dependent variable. Thus, late change scores for the BAI, BDI-II, PANAS-PA, and PANAS-NA were each entered individually as a dependent variable in four separate regression analysis. None of these models were significant.

Post-hoc analysis examined whether scores on the cognitive measures changed across the course of treatment. Paired samples *t*-tests were conducted for each cognitive measure to examine the change in mean scores from pre- to mid-treatment, mid- to post-treatment, and pre- to post-treatment. For the IUS-12, changes from pre- to mid-treatment and pre- to post-treatment were not significant, but the change from mid- to post-treatment was significant, $t(8) = 2.186$, $p = .036$. Paired *t*-tests were conducted in the same manner for the PSWQ, CCL, and the two subscales of the CCL (CCL-A and CCL-D), but none of the changes were significant. Aside from the significant change on the IUS-12 from mid- to post-treatment, the extent of cognitive change at other time points and on the other cognitive measures, was not greater than what would occur by chance. This general lack of cognitive change may explain why cognitive change was not found to predict symptom change.

Table 6

Pearson Product-Moment Correlation Coefficients Among Early and Late Change Scores

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. IUS-12 – *a*														
2. CCL – *a*	.16													
3. PSWQ – *a*	.04	.89*												
4. BAI – *a*	.72	.47	.27											
5. BDI-II – *a*	.16	.93**	.88*	.48										
6. PANAS-PA – *a*	-.65*	-.35	-.38	-.51	-.65									
7. PANAS-NA – *a*	.75**	-.12	-.18	.59	-.05	-.66*								
8. IUS-12 – *b*	-.65	.47	.87	.03	.48	.29	-.50							
9. CCL – *b*	-.19	-.12	.87	.48	.50	.09	.02	.44						
10. PSWQ – *b*	.33	.73	.69	.77	.88	-.82	.38	.49	.88*					
11. BAI – *b*	.23	.71	.78	.80	.80	-.50	.23	.54	.73	.89*				
12. BDI-II – *b*	.39	.58	.59	.84*	.72	-.70	.51	.38	.72	.98**	.92**			
13. PANAS-PA – *b*	-.63	-.43	-.56	-.95**	-.72	.60	-.46	-.03	-.48	-.88	-.84*	-.89**		
14. PANAS-NA – *b*	.03	.42	.78	.79	.84*	-.22	.04	.57	.62	.87	.99**	.91*	-.70	

Note. *a* = Early change; *b* = Late change
* $p < .05$
** $p < .01$

Table 7

Overall Change Scores Correlated with Early and Late Change Scores

	IUS-12 – *c*	CCL – *c*	PSWQ – *c*	BAI – *c*	BDI-II – *c*	PANAS-PA – *c*	PANAS-NA – *c*
1. IUS-12 – *a*	.74*	.56	.38	.97**	.50	-.52	.51
2. CCL – *a*	.01	.87**	.97**	.54	.89*	-.27	-.24
3. PSWQ – *a*	-.02	.47	.91*	.55	.97**	-.34	-.12
4. BAI – *a*	.53	.64	.61	.95**	.68	-.56	.44
5. BDI-II – *a*	.20	.79*	.80	.70	.94**	-.62	.12
6. PANAS-PA – *a*	-.68	-.43	-.43	-.83*	-.74	.89**	-.58
7. PANAS-NA – *a*	.59	.03	.08	.86*	.33	-.60	.81*
8. IUS-12 – *b*	.03	.14	.76	.71	.79	-.86**	.54
9. CCL – *b*	.66	.38	.80	.81	.70	-.64	.70
10. PSWQ – *b*	.50	.70	.92*	.82*	.78	-.71	.85**
11. BAI – *b*	.22	.23	.88	.95**	.93**	-.85**	.65
12. BDI-II – *b*	.49	.28	.96**	.92**	.91*	-.74*	.76*
13. PANAS-PA – *b*	.14	-.23	-.91*	-.75	-.87*	.90**	-.52
14. PANAS-NA – *b*	-.06	.38	.73	.67	.84*	-.77*	.61

Note. *a* = Early change; *b* = Late change; *c* = Overall change
* $p < .05$
** $p < .01$

Table 8

Pearson Product-Moment Correlations Between Overall Change Scores

	1	2	3	4	5	6	7
1. IUS-12							
2. CCL	.56						
3. PSWQ	.35	.78*					
4. BAI	.82**	.70*	.54				
5. BDI-II	.64	.88*	.78*	.85**			
6. PANAS-PA	-.77*	-.51	-.55	-.76*	-.74*		
7. PANAS-NA	.71*	.15	.25	.58	.43	-.74*	

* $p < .05$
** $p < .01$

Hypothesis 4

A hierarchical regression was conducted to examine whether cognitive change mediates change in anxiety scores over the course of GCBT. In other words, overall cognitive change was examined as a mediator of the relationship between pre- and post-treatment anxiety scores, as measured by the BAI. In the hierarchical regression model, post-treatment anxiety score on the BAI was entered as the dependent variable, while pre-treatment BAI scores were entered at Step 1 and demographic variables were entered at Step 2 in order to control for these variables. Given the small sample size, only the demographic variables of Age and Sex were entered at Step 2 in order to reduce the total number of predictors. The overall change scores on the IUS-12, CCL, and PSWQ were entered in the third and final step of the regression model. In the first step of the hierarchal regression, R was significantly different from zero, $F(1, 7) = 6.73$, $p < .05$. The adjusted R^2 value in the third step suggested that all of the variables in the model, together,

account for 78% of the variability in post-treatment BAI scores. However, the addition of the demographic and cognitive variables did not significantly improve the fit of the model. Therefore, the overall change on the cognitive variables was not found to mediate change in anxiety symptoms over the course of GCBT.

Hypothesis 5

Pearson correlations were computed between homework compliance and overall change scores on the outcome measures (BAI, BDI-II, PANAS-PA, PANAS-NA) in order to investigate whether homework moderates symptom change. Correlations could not be conducted for homework ratings given at mid-treatment, due to the lack of variability among the data on this variable. A rating of 3 was given on all of the homework ratings at mid-treatment that could be paired with the outcome change variables. As demonstrated in Table 9, homework completion ratings provided at post-treatment did not correlate significantly with any of the outcome measures.

Table 9

Pearson Correlations between Overall Change Scores on the Outcome Measures and Homework Compliance at Post-Treatment

	Homework Compliance (n = 9)
BAI	-.09
BDI-II	.23
PANAS-PA	-.06
PANAS-NA	-.20

Note.
* $p < .05$
** $p < .01$

Discussion

The present study sought to evaluate the outcomes of transdiagnostic GCBT, whereby participants with heterogeneous anxiety presentations and various comorbidities were treated with a single, unified manual. The study also aimed to gain an understanding of how this transdiagnostic treatment format exerts its effects. More specifically, the two objectives of the study were: (1) to assess whether anxiety and mood symptoms improved among participants enrolled in the therapy, and (2) to examine potential mediating and moderating variables that may contribute to how therapy improves symptoms for clients. Evaluating the effectiveness of this treatment was expected to contribute to the current understanding of the utility of transdiagnostic therapy for anxiety, and to uniquely contribute to the literature by examining processes of change within transdiagnostic CBT. As this treatment format may offer advantages over other approaches due to its feasibility, demonstrating the efficacy and effectiveness of the treatment is particularly important.

Efficacy of Transdiagnostic GCBT

The hypotheses predicting that anxiety and mood symptoms would improve significantly following completion of the therapy group were not supported. Though the means on each outcome measure decreased from pre- to post-treatment, this change was not found to be statistically significant. This finding diverges from the majority of transdiagnostic CBT efficacy research that has been produced to date (e.g., Ellard et al., 2010; Erickson, 2003; Garcia, 2004; Hooke & Page, 2002; Manning et al., 1994; McEvoy & Nathan, 2007; Norton, 2008; Norton & Hope, 2005; van Ingen & Novicki, 2009), although Norton and Hope (2005) did not find significant symptom improvement on the self-report measures in their transdiagnostic GCBT effectiveness study.

The insignificant symptom change found in this study may have been obtained for several reasons. First and foremost, the very small sample sizes (*n* ranged from 6 to 11) utilized in the in the paired samples *t*-tests may have impacted the results since several participants did not complete the questionnaires at all three time points. These analyses were underpowered for the detection of even a large effect size (as determined through G*Power) and this analysis was quite likely subject to a Type II error.

Secondly, the study participants reported greater symptom severity compared to previous research. Some of the people who participated could have had more treatment-resistant presentations than what is typically observed. In examination of pre-treatment symptom severity, the pre-treatment means on the BAI fell in between the moderate and severe symptom ranges, and the pre-treatment means on the BDI-II fell within the lower end of the severe symptom range. At post-treatment, both of the means on these measures were in the moderate symptom range. Other transdiagnostic treatment studies using these outcome measures reported less severe pre- and post-treatment means. Ellard et al. (2010) reported initial BAI means in the moderate range that reduced to mild symptomatology, and BDI-II scores that reduced over treatment, but were in the mild symptom range at both time points. Similarly, McEvoy and Nathan (2007) reported pre-treatment means on both the BAI and BDI in the moderate range that reduced to the mild symptom range at post-treatment. Thus, this sample may differ from that of other transdiagnostic studies in terms of symptom severity.

Relationships Between Cognitive Change and Symptom Change

Though changing cognitions forms the basis of CBT, the present study did not find support for cognitive mediation of the change in symptoms from pre- to post-treatment.

Cognitive change from pre- to mid-treatment was expected to correlate with change on the outcome measures from mid- to post-treatment, and early cognitive change was expected to predict late change in anxiety symptoms. The lack of support for these hypotheses may have occurred for a number of reasons, including the low statistical power again. Additionally, an extremely high Cook's value was obtained in the standard regression analysis that examined the predictive role of the cognitive variables. Almost all variables had Cook's values that were too high, suggesting that the data points had too large of an impact on the regression analyses (Stevens, 1984). Furthermore, scatterplots of residuals from the standard regression analysis suggested that the relationships between early cognitive change scores and late cognitive change scores had low linearity. The assumptions of a linear model may have therefore been violated.

While the aforementioned factors may have influenced the analyses, another prominent factor that was likely paramount to the lack of support for these hypotheses, is the lack of cognitive change that occurred. Post-hoc analyses indicated that, with the exception of change in IU from mid- to post-treatment, cognitive change at all other time-points and with the other cognitive measures was not statistically significant. Thus, cognitive change generally did not occur in the present study. The lack of cognitive change resulted in subsequent analyses not supporting the hypothesis that early cognitive change predicts late symptom change.

Change in cognitions may have been statistically insignificant in the present study, due to characteristics of the treatment, participants, or measures. As the manual used in this study was not an exact replica of the transdiagnostic manuals that have been evaluated in published efficacy and effectiveness studies to date, the delivery of treatment components in this study could have differed. The core components that have generally been included in other transdiagnostic manuals (psycho-education, relaxation, exposure, and thought restructuring), were also included

in the therapy analyzed in this study, although, the manner in which these components were delivered could have differed. Also, Norton and Philipp (2008) found in their meta-analysis of transdiagnostic studies that treatments including relaxation produced smaller effect sizes than treatments without relaxation. They suggested that this may have been due to how maladaptive core beliefs are not addressed with relaxation (Norton & Philipp, 2008). As the present therapy included a relaxation component, perhaps the treatment was less able to target maladaptive cognitions.

It is also possible that the assessment time points in this study may not have been frequent enough to adequately capture the sequence of change for cognitive and outcome variables. Kazdin (2007) noted that a pre-, mid-, post-treatment measurement design may give the false impression that potential mediators and outcomes changed at the same time, or may not be sensitive enough to capture when change occurs. The timing of particular therapy teachings may also impact when cognitive change occurs. In this study, acknowledging anxiety-related thoughts and unhelpful thinking is discussed in session 5, while challenging thoughts is covered in session 6, so one may speculate that greater cognitive change would occur after these sessions. In the current design, this type of change pattern may be "washed out" due to the time between the mid- and post-treatment assessments. However, it may also be possible that cognitive change occurs continuously throughout treatment, since CBT components such as psychoeducation and exposure could alter one's perceptions of their anxiety and situations or stimuli.

Patient symptom severity may have also contributed to the lack of cognitive change. The pre-treatment mean on the IUS-12 in this study was higher than means obtained among patients with anxiety disorders in a study by Carleton et al. (2012), which ranged from 37.01 (*SD* = 12.45) to 41.65 (*SD* = 10.23). However, the sample of patients with Major Depressive

Disorder in Carleton and colleagues' study had a higher mean score ($M = 43.04$, $SD = 9.20$), than participants in the present study. Also, the pre-treatment PSWQ mean in this study was indicative of high worry. There is some evidence of an initially high severity on these cognitive measures, which could have impacted outcomes. Greater symptom severity could also be reflective of more salient dysfunctional core beliefs. People who hold more dysfunctional beliefs, or more deeply ingrained dysfunctional beliefs, may show a reduced treatment response. Pedrelli, Feldman, Vorono, Fava, and Peterson (2008) reported that patients with high stress and high dysfunctional attitudes at pre-treatment demonstrated less symptom change at post-treatment than patients without high pre-treatment scores on these variables. Both symptom and core belief severity among the participants in this study could contribute to the lack of cognitive change. With such a small sample size, the analyses would be impacted if even a few participants had higher severity.

The nature of the cognitive measures employed in this study may have further contributed to the lack of cognitive change. To our knowledge, the IUS-12 and the CCL have not been used previously in published research examining transdiagnostic treatment for anxiety, and the PSWQ has been used in one heterogeneous anxiety treatment (Westra et al., 2007), though it was only analyzed among patients with GAD. Since these measures have not been previously used to examine cognitive change in transdiagnostic GCBT for anxiety, it is possible that they are not as relevant for this type of treatment.

Even if cognitions had changed significantly in the present study, there remains the possibility that cognitions do not mediate symptom outcomes in transdiagnostic treatment. Studies evaluating mediators of change in therapy have not consistently demonstrated cognitive mediation (e.g., Burns and Spangler, 2001), although the cognitive-mediation hypothesis

proposed by Beck and colleagues (1979) has been supported in GCBT contexts examining depressive symptoms as the outcome variables (Dwyer, Hornsey, Smith, Oei, & Dingle, 2011; Kwon & Oei, 2003; Marquez-Gonzalez, Losada, Izal, Perez-Rojo, & Montorio, 2007; van Aalderen et al., 2012). As cognitive mediation has rarely been studied within a transdiagnostic treatment context, the potential for cognitions to cause symptom change in this therapy is not well understood. Other relationships between cognitive and symptom change are also possible. For example, Kwon and Oei (2003) suggested that a bi-directional relationship between cognitions and symptoms could exist. This would suggest that a change in cognitions contributes to a change in symptoms, while a change in symptoms also contributes to a change in cognitions.

Alternatively, there may be other variables in this unique type of treatment that also contribute to symptom change. Process variables such as group cohesion or expectancy to change could impact the extent to which patients engage in the treatment and receive its full effects. Behavioural change could also potentially relate to symptom change in this type of therapy. Erickson (2003) found that behavioural avoidance improved throughout the course of transdiagnostic GCBT for anxiety. The relationships between group process variables, expectancies, behavioural change, and symptom outcomes are in need of further investigation.

The study also sought to explore IU as a transdiagnostic concept. Though early change on the IUS-12 had low correlations with late change on most outcome variables, it was highly correlated with early change on the BAI and the PANAS-NA, and moderately correlated with the total change in these variables. This lends some support for the relevance of IU with a heterogeneous anxiety group. However, in consideration of the lack of statistically significant

changes in cognitions, the utility of the cognitive measures in a transdiagnostic context needs to be further explored.

The Role of Homework Compliance

Contrary to prediction, homework compliance assessed after the last session did not mediate outcomes in this study. This finding is likely due to the small sample size obtained, but may also be attributable to the way in which homework was assessed. As only one item evaluating the frequency of homework completion was used, this may not adequately capture the active ingredient by which homework could potentially influence outcomes. There may be other aspects of homework besides the frequency of completion that could enhance skill acquisition or understanding of CBT. To address this possibility, some studies (e.g., Cammin-Nowak et al., 2013) have differentiated homework quantity and quality, since a person who is fully engaged in the homework activity and uses the activity to relate skills or concepts to their everyday lives, may receive greater benefits from this practice than a person who quickly jots down information right before a review of the week's homework commences. Teasing apart and assessing the extent to which a client generalizes the skills and principles practiced through homework to their everyday lives, has been suggested as an avenue for future research (Kazantis, Whittington, & Dattilio, 2010). Perhaps the literature has produced inconsistent results concerning the relationship between homework and outcomes, because of other constructs related to homework completion, such as generalization, that may impact outcomes. As Kazdin (2007) proclaimed, studying moderation of change is important, since it may identify areas that warrant further study for their potential to lead to an understanding of a mechanism.

Another potential reason for the lack of support for homework as a moderator of treatment outcomes in this study is the influence of social desirability. Participants may have

endorsed frequent homework completion in order to present themselves in a more favourable light. Therapist-rated homework completion measures that assess both quantity and quality of homework may be a useful measurement approach for future studies investigating moderation.

Limitations

There are several limitations to the present study that must be acknowledged. As previously stated, the low sample size resulted in the underpowering of all analyses. Additionally, the small sample size reduces the representativeness of the sample and the ability to generalize any findings. The methods of the present study, such as the lack of a control group and lack of randomization constitute other important limitations. These limitations could not be addressed due to structural barriers, as the Mental Health Outpatient Program eliminated the wait-list that had been intended to form the control group.

Several other aspects of the study design had been implemented at the requests of the Research Ethics Boards (REBs). Participants were not able to complete the questionnaires in the therapy room before or after sessions, or in another room, in order to protect participants' privacy. Thus, the questionnaires could only be completed by mail. The mailing format posed several limitations; for example, the exact timing of questionnaire completion could not be determined. Some participants may have taken the questionnaire home and completed it immediately, while some may have completed them a few days after receiving the package. Also, outcome measures and cognitive measures may not have always been completed on the same day since some measures were administered during the group sessions for separate program evaluation purposes. With the mailing format, participants were also unable to ask for clarification of words or items they did not understand.

Other changes made to the study design at the request of REBs included the use of self-generated codes to match participants' questionnaires across time, and the introduction of the study after the first therapy session as opposed to before it. Inconsistencies in the self-generated codes sometimes precluded mailed measures from being matched to the program evaluation measures at the same assessment time-point, thus resulting in the loss of data. Introducing the study after participants received a first session of therapy limited the ability of the initial assessment to reflect true baseline functioning. Concerns were also posed by the REB about the appropriateness of anonymous self-report questionnaires with clinical content, with particular concern surrounding the suicide ideation item. These concerns were addressed through discussion, deliberation, and revision, which simultaneously extended the review process. The total time available for data collection was greatly reduced by this review process. Consequently, data could not be collected from the winter and spring groups in 2013.

Though the inclusion of a treatment fidelity measure and the measurement of symptoms at pre-, mid-, and post-treatment, are methodological strengths of study, there are limitations within these approaches. The utilized clinician-reported treatment fidelity measures could be subject to bias as the group facilitator, rather than an observer, completed it. Videotaping or recording sessions so they can be rated for manual adherence by an observer, is one way of enhancing the reliability of treatment fidelity measures.

In terms of the cognitive and symptom measurement time points, assessing all variables at every session would have provided a more thorough depiction of the pattern of change for each individual. Moreover, assessment at every session would allow change in cognitions and outcomes to be aligned with the specific components covered in the therapy group.

As mentioned within the context of the homework compliance measure, self-report questionnaires pose limitations such as social desirability. While clinician-administered diagnostic interviews administered at pre- and post- treatment are more reliable methods for assessing response to treatment, such an approach may not be relevant for all transdiagnostic research. For example, participants in the present study have not necessarily been given a formal diagnosis, so symptom measurement appears to be the most appropriate way of evaluating response.

Uncertainty regarding some patient characteristics is another noteworthy limitation. Though the demographic questionnaire asked respondents to list their diagnoses if they have been diagnosed, some of the given information was not specific. Respondents may list "anxiety" or "depression" which does not differentiate between types of anxiety and mood disorders. Medication use, particularly the inability to ensure medication dose was held stable during therapy, in another limitation. As other transdiagnostic studies have included participants taking medication (e.g., Ellard et al., 2010; Norton, Hayes, and Hope, 2004; van Ingen & Novicki, 2009) and still found significant changes, it is more so the inability to know whether medication changed during therapy, that is a limitation in this study. Conclusions regarding therapy efficacy, and for whom the treatment works are limited when these participant variables are unclear.

Future Research

Many avenues for future transdiagnostic research have been identified due to the limitations preventing the present study from accurately evaluating the outlined hypotheses. As transdiagnostic research is relatively new, there is still a pressing need for studies to evaluate the efficacy of this therapy format in terms of change on primary and secondary symptoms.

Moreover, the mechanisms by which this therapy creates symptom change is still not well understood. In order to advance the current body of research, randomized, controlled studies are needed. Effectiveness studies including participants taking medication is also advantageous since it is important to understand how a transdiagnostic approach works in typical clinical settings.

Additional research is also needed to better understand how patient characteristics may relate to treatment outcomes. As this study did not find significant symptom changes over the course of treatment, and the initial means of the symptom measures were slightly higher than those reported in two of the other transdiagnostic effectiveness studies utilizing the same measures, the relationship between symptom severity and outcomes should be further investigated within a transdiagnostic treatment context. The relationship between transdiagnostic treatment outcomes and diagnoses also needs to be elucidated, since Erickson et al. (2007) found a better response among participants with panic disorder.

The active mechanisms within transdiagnostic GCBT also needs to be explored further. Understanding what it is about the treatment that leads to improved outcomes, could then allow the key mechanisms to be targeted in order to enhance treatment response. Evaluating mediators and moderators of treatment outcomes is viewed as an initial step to identifying mechanisms of change (Kazdin, 2007). The present study lays the groundwork for future studies to expand upon and enhance with the utilization of larger samples, in order to understand the sequence of change in potential mediators and outcomes. Using a study design that allows for the temporal sequence of change to be addressed is crucial to identifying a true mediator of change. Studies assessing change at every session would provide considerable contributions to the understanding of change during transdiagnostic GCBT.

Lastly, further investigation of proposed transdiagnostic concepts such as negative affect, could enhance the understanding of how different disorders and comorbidities can be addressed with a unified treatment protocol. As the Tripartite theory suggests that negative affect is the common underlying construct of anxiety and mood disorders, research exploring how this construct changes over the course of transdiagnostic CBT is warranted.

Conclusion

The present study was unable to provide support for the efficacy of transdiagnostic GCBT or the mediating role of cognitions, due to several limitations. However, relationships between changes in cognitions and changes in symptoms were identified. This study provides a framework for future studies to expand upon, as important areas were examined. Specifically, this study highlights the need for mechanisms of change within transdiagnostic GCBT to be further researched. Moreover, the use of a pre-, mid-, post-treatment assessment design allows for a greater understanding of the sequence of change, compared to the common pre- and post-designs that have been employed in most transdiagnostic studies to date. Transdiagnostic GCBT for anxiety is a feasible and cost-effective approach that may enhance the dissemination of treatment. The substantial advantages offered by this type of therapy format due to its practicality, heightens the need for its efficacy to be evaluated and for its mechanisms to be understood.

STUDY 2: Systematic Review of Study Designs Used to Establish Mediation in the Context of GCBT

Study 1 sought to evaluate the effectiveness of a transdiagnostic group CBT protocol and to identify variables that contribute to symptom improvement. However, due to requests made by the hospital REB that impacted the study design and participant recruitment, as well as due to the difficulties associated with clinical data collection, the feasibility of Study 1 was significantly impacted. Thus, Study 2 sought to examine the study design and methodology used by published studies examining mediation in the context of GCBT. A systematic review of recent published literature was conducted to determine the quality of the methodologies used and to summarize the research findings in this area.

As this systematic review draws heavily on Kazdin (2007)'s paper describing mediation, his key concepts and definitions will first be reviewed. The criteria required to establish mediation are described next, followed by a summary of study design considerations and commonly used statistical approaches.

Key Concepts and Definitions

Elucidating exactly how treatment leads to improved outcomes may enhance the efficacy and effectiveness of a given psychotherapy. If the specific processes by which cognitive behavioural therapy exerts its effects are identified, then these processes could potentially be capitalized on in order to maximize the benefits of the therapy. Kazdin (2007) stated that there is ample theoretical information regarding why therapy works, but little empirical evidence exists to support the theories. Studies that do seek to understand how therapy works often focus on mediation.

Kazdin (2007) asserted that there is a key distinction between mediators and mechanisms of change in psychotherapy. A mediator is "an intervening variable that may account (statistically) for the relationship between the independent and dependent variable" (Kazdin, 2007, p. 3). With regards to Cognitive Behavioural Therapy (CBT), the theoretical basis of a mediator suggests that CBT would lead to a change in the mediator variable, which then leads to a change in the outcome (Johansson & Hoglend, 2007). While statistical mediation does suggest an important relationship between variables, it does not necessarily explain how change occurred during therapy. Comparatively, a mechanism is a variable or process that explains how or why the change occurred (Kazdin, 2007). A mechanism extends the statistical mediation relationship, as a true mechanism is determined by multiple studies providing empirical and theoretical support for the mediating role of the variable. Additionally, specific methodological characteristics must be present to test and demonstrate a mechanism of therapy (Kazdin, 2007).

Predictors and moderators are other constructs that are commonly evaluated in psychotherapy research. It is important to note how variables that act as predictors or moderators differ from that of a mediator. A predictor is a variable at pre-treatment that provides information about outcomes, but it does not interact with the treatment (Johansson & Hoglend, 2007). A moderator is also a pre-treatment variable, but it interacts with the treatment by influencing the direction or magnitude of the effect of therapy on outcomes (Kazdin, 2007). Moderators differ from mediators, since mediators change due to the treatment and they are indicated as a cause of the outcome (Johansson & Hoglend, 2007). Though predictors and moderators also provide valuable information, mediators are often the focus of studies due to their potential to demonstrate causal relationships.

Criteria for Establishing Mediators/Mechanisms

In order to determine that a particular variable acts as a mediator or a mechanism of change, specific criteria need to be met. Temporal antecedence of the mediator is a critical component of mediation that is highlighted by several authors (e.g., Johansson & Hoglend, 2007; Kazdin & Nock, 2003; Kazdin, 2007; Kraemer, Wilson, Fairburn, & Agras, 2002). This entails that the change in the mediator precedes the change in the outcome. As logically expected, a cause would need to occur before an outcome in order to truly be a cause. Kazdin (2007) outlined 7 criteria for mediation, which include: 1) strong association (the therapy must be associated with the proposed mediator and the proposed mediator must be associated with the outcome variable), 2) specificity (demonstrating that other variables are not mediators), 3) consistency (replication of mediating role of the variable), 4) experimental manipulation, 5) temporal antecedence of the mediator, 6) gradient (more of the mediator leads to greater improvement in outcomes, and 7) plausibility (the way the variable intervenes and affects outcomes is plausible and fits with existing theory and scientific knowledge). Several of these criteria must be met in order to assert that a variable is a true mediator in therapy (Kazdin, 2007). Accordingly, multiple studies are likely needed to form the strong research background and theoretical foundation that is necessary to empirically test mediation. The particular methodologies employed in studies evaluating mediators/mechanisms of therapy also warrants consideration, as some research designs may be better able to test these processes.

Evaluating Mediators and Mechanisms

Study design considerations. The specificity criterion could be addressed by measuring multiple mediators in a single study. Empirical support generated for the mediating role of a variable is strengthened when other variables have also been evaluated, but shown to not act as

mediators (Kazdin, 2007). In order to address the timeline criterion for identifying a mediator, it has been suggested that both the mediator variable and the outcome variable be evaluated at multiple points throughout the therapy (Johansson & Hoglend; Kazdin, 2007). Measuring the change in each variable at every session would be ideal, as this would provide a detailed account of the pattern and timeline of change for each variable. Kazdin (2007) asserted that the failure to establish a timeline regarding change in the mediator and change in the outcome is a common limitation of randomized controlled trials.

Statistical methods for determining mediation. Establishing statistical mediation is a first step in determining a mechanism of change in psychotherapy (Kazdin, 2007). Several methods have been proposed for evaluating whether a variable plays an intervening role in the relationship between other variables. A review by MacKinnon and colleagues (2002) classified the methods of measuring mediation into the three categories of causal steps approaches, product-of-coefficients tests, and difference-in-coefficients tests, while more contemporary approaches also include structural equation modeling (SEM) and bootstrapping.

Causal steps approaches. The Baron and Kenny (1986) causal steps method is frequently cited as the most commonly used approach to evaluating mediation (e.g., Hayes, 2009; MacKinnon, Lockwood, Hoffman, West, and Sheets, 2002). Baron and Kenny presented a path diagram indicating that a variable acts as a mediator if the following criteria are met: 1) variations in the independent variable (IV) account for changes in the proposed mediator, 2) variations in the proposed mediator account for variations in the dependent variable (DV), and 3) the relationship between the IV and DV is no longer significant once the paths between the IV and mediator and the mediator and DV are accounted for. If the relationship between the IV and DV reduces to zero once the mediating variable is accounted for, then this would indicate

complete mediation. Complete mediation is not very likely in social science analyses, as there are often multiple factors that impact mediation, so one variable does not often fully explain the relationship between two other variables (Baron & Kenny, 1986). Thus, partial mediation is more common. Partial mediation is when the IV-DV relationship reduces significantly once the mediator is controlled for, but this relationship does not completely extinguish (Baron & Kenny, 1986).

In addition to the Baron and Kenny (1986) method, there are other variants of the causal steps approach that follow a similar underlying logic. In these approaches, the relationship between the IV and DV is referred to as the 'total effect', which is comprised of the influence of the mediator (i.e., the 'indirect effect') and the remaining IV-DV relationship after the mediating variable has been controlled (i.e., the 'direct effect'; Tabachnick & Fidell, 2013). To statistically evaluate the Baron and Kenny (1886) mediation model, regression analyses are commonly conducted to determine whether the three aforementioned paths of mediation are supported. Thus, separate analyses are often conducted for each proposed pathway, and the logic of the diagram then allows the researchers to conclude whether or not mediation has been demonstrated.

Product-of-coefficients tests. In contrast to the Baron and Kenny approach, which infers a variable's causal role, there are other approaches to evaluating mediation that consist of measuring the indirect effect. The indirect effect is conceptualized as the product of the path from the IV to the mediator and the path from the mediator to the DV, and so it is commonly represented by the term, *ab* (Preacher & Hayes, 2004). The product-of-coefficients tests analyze whether the indirect effect is significant, by dividing the indirect effect (*ab*) by the standard error, and then comparing this statistic to a normal distribution (Hayes, 2009; MacKinnon et al.,

2002). There are also specific variants of the product of coefficient tests, with the Sobel test (Sobel, 1982, 1986) being one of the most commonly used tests in this group. The Sobel test is sometimes used in addition to the Baron and Kenny method, though Hayes (2009) asserts that there is little added benefit to combining these approaches, since it is not necessary to establish mediation with the causal steps before statistically evaluating the indirect effect. The Sobel test, along with other tests that divide the intervening effect by the standard error and then compare to a normal distribution, may be inappropriate when mediation effects are not normally distributed (Hayes, 2009).

As mediation effects are not often normally distributed, some authors have recommended using approaches to measure mediation that do not assume a normal distribution of the data. Specifically, Hayes (2009) and Zhao, Lynch, and Chen (2010) have recommended using the bootstrapping approach. The bootstrapping approach uses a repeated resampling process to create an empirical representation of the distribution of the indirect effects (Hayes, 2009).

Difference-in-coefficients tests. Difference-in-coefficients tests are another method for evaluating the intervening effect of a variable. These approaches compare pairs of correlation coefficients to examine the IV-DV relationship before and after controlling for the mediator (MacKinnon et al., 2002). Some limitations of the difference in coefficients tests are that some are nondirectional, and that these tests do not easily generalize to multiple mediator models (Cheung & Lau, 2008; MacKinnon et al., 2002).

Structural Equation Modeling. A more contemporary method of evaluating mediating is through Structural Equation Modeling (SEM). SEM consists of forming a hypothesized model of the relationships between IVs and DVs, as well as the potential mediating pathways. The proposed model is then compared to the data to examine how well the model fits the data. The

indirect effect is evaluated through a product-multiplication approach (*ab*; Tabachnick & Fidell, 2013). SEM has some benefits over hierarchical regression approaches due to its ability to analyze latent variables with more than one indicator, to control for some measurement errors, to outline all relevant pathways and to reflect a more complicated model where multiple variables can be assessed simultaneously (Cheung & Lau, 2008).

Comparison of the statistical tests in simulation studies. As there are various methods of evaluating mediation, some studies have been conducted to compare the statistics produced by these approaches. MacKinnon et al.'s (2002) comparison of methods for evaluating intervening variables concluded that the causal steps approach may inaccurately estimate Type I error rates and have low power, unless there is a large sample size or large effect size. The difference-in-coefficients methods demonstrated higher power than the causal steps approaches, but Type 1 error rates were still inaccurate. The product-of-coefficients methods also had higher power than the causal steps approaches, but they too had inaccurate Type 1 error rates (MacKinnon et al., 2002). This study was later extended by Cheung and Lau (2008), who examined mediation effects in SEM as well as the confidence intervals produced by eight different statistical methods. They concluded from their analyses that hierarchical regression may result in underestimation of mediator effects due to measurement errors, while SEM is able to control for some of the measurement errors. Additionally, the bootstrapping method was found to produce more accurate confidence intervals than the four other analyzed methods that assume a normal distribution of the data (Cheung & Lau, 2008).

Overall, it appears as though contemporary approaches of measuring indirect effects, particularly through the use of SEM and the use of bootstrapping to adjust for skewed distributions, are effective ways to measure mediation that also address some of the limitations

of the earlier approaches. The most effective method for evaluating a mediator will vary depending on factors such as sample size, distribution of the data, and whether multiple mediators are being examined.

Though the type of statistical analysis is important when interpreting results, it is also critical to consider these results in combination with the study design. A variable cannot be supported as a cause of the outcomes if both statistical mediation and the key criteria outlined by Kazdin (2007) are not met.

Purpose of the Review

Investigating the possible mechanisms of change in therapy may enhance outcomes if the processes that are responsible for the positive symptom change are identified and can then be targeted. As Kazdin (2007) indicated, strong research designs are needed in order to identify the mediators and mechanisms involved in psychotherapies. This review seeks to gain an understanding of the study design and statistical methods used to establish mediators of group CBT. A systematic review will be conducted as this procedure can address methodological questions by comprehensively identifying all relevant studies and examining the methods that are employed (Petticrew & Roberts, 2008). Specifically, this review will address the question: What is the quality of the methodologies that are used to measure mediators of outcomes in cognitive behavioural group therapy for adults? Other aspects of the research methods in each study, such as whether a treatment fidelity measured is used, what statistical analyses are used, and what measurement tools are used, will also be explored.

Methods

Data Sources and Search Strategy

Following Perestelo-Perez's (2013) recommendation to use more than two or three databases when conducting a systematic review, several sources were accessed. PsychINFO, Pubmed, Web of Science, CINAHL, Proquest Nursing & Allied Health Source, and Evidence Based Medicine (EBM) Reviews were searched. These databases were chosen based on their relevance to psychotherapy outcomes and group therapy. In addition to the electronic database search, Google and Google Scholar were used to identify additional studies that were not contained in the journal databases. In order to ensure that all relevant studies were considered and not missed due to imperfect indexing in the databases, the reference lists of all included studies were hand searched for additional published research. As the Cochrane Collaboration Group suggests also viewing the references of other relevant systematic reviews during the study identification phase (Van Tulder et al., 2003), the references listed in the review by Johansson and Hoglend (2007) were also examined to determine whether studies met the inclusion criteria.

In order to locate articles that examine a mediator or mechanism of change in group CBT for adults, various search terms were used to address each of the following key components: a cognitive-behaviourally based treatment, group treatment format, and evaluation of mediators/mechanisms. These search terms are presented in Table 10. They were entered altogether into each database, and the MeSH terms outlined in Table 10 were added to the search terms when it was possible. The location of the search terms was not limited to titles and abstracts, as the terms were searched for anywhere in an article.

Table 10

Search Terms Used to Represent Key Features of the Inclusion Criteria

Key Categories	Search Terms Entered
Therapy based on cognitive-behavioural principles	cognitive-behav* therap* OR cognitive behav* therap* OR CBT OR cognitive-behav* treatment OR cognitive behav* treatment OR cognitive-behav* intervention OR cognitive behav* intervention
Group treatment format[a]	"group treatment" OR "group therapy" OR "group session" OR "group format" OR "group psychotherapy" OR "group intervention"
Mediator or mechanism of change	mediat* OR mechanism
MeSH terms	"psychotherapy, group" and "cognitive psychotherapy"

[a] The group format terms were in quotations due to the large number of studies that include the word 'group' but did not involve group therapy sessions.

The search was further limited to articles published in English between 2000 and May 2014. An initial search identified 122 articles in PsychINFO, 63 articles in Pubmed, 89 articles in Web of Science, 4 articles in CINAHL, 92 articles in Proquest Nursing & Allied Health Source after further filtering the search by age group and the two MeSH terms, and 73 articles in Evidence Based Medicine (EBM) Reviews. Google Scholar identified 13,100 articles. Since Google Scholar lists articles in order of their relevance, and the identified articles were demonstrating to be irrelevant part way through examination of the first 50 pages, only the first 50 pages of results were examined (approximately 500 titles and abstracts). Additionally, a general Google search was conducted, which generated 6 results.

Inclusion and Exclusion Criteria

Studies were required to meet the following inclusion criteria in order to be included in the review: (1) involve an adult sample (treatment groups must have an average participant age between 18 and 60); (2) assess a mediator variable at a minimum of one time point; (3) explicitly

state in the article that mediation or a mechanism of change was being analyzed; (4) assess outcomes following a form of cognitive behavioural therapy in a group format; (5) assess psychological outcomes; (6) publication between 2000 and May 2014; and (7) written in the English language. Infant, child, adolescent, and geriatric populations were excluded in order to narrow the focus of the review, and because the largest number of published group CBT articles evaluating mediators/mechanisms were expected to involve an adult population. The outcomes could be related to people of another age group (e.g., child behaviour as an outcome of a CBT parenting program), but the participants attending the treatment group had to be adults. Treatments or interventions were included if they were described to follow cognitive-behavioural principles or included cognitive and behavioural components. Acceptance and Commitment Therapies that focused on accepting ones thoughts as opposed to challenging thoughts were excluded. Though these treatments are variants of CBT, they were excluded in order to create a more focused review that explores treatments based on traditional CBT principles. Family interventions that include both children and parents in the treatment sessions were excluded. Additionally, articles were only included if they specifically stated that the treatment was delivered in a group format. Treatments with both individual and group sessions were still included if the treatment appeared to be primarily administered in a group format. Psychological outcomes were defined as measured variables pertaining to: symptoms of mental disorders, aspects of mental health (e.g., self-esteem, stress), functioning in areas of one's life (e.g., quality of life), or a physiological measure that was intended to reflect a psychological construct (e.g., a measure of cortisol to indicate stress). Studies that only evaluated other types of outcomes (such as biological treatment adherence, or weight-loss) following a CBT based program were excluded. Meta-analyses were also excluded from the present review.

Article Screening and Selection

The primary reviewer conducted an initial screen of the articles that were identified in each of the databases. This pre-selection phase consisted of examining the article title and abstract to determine if the article could possibly meet inclusion criteria. The full text of some articles was viewed in this process if there was insufficient information in the abstract and title to adequately judge the article's relevance. A total of 64 articles were identified as possibly meeting the inclusion criteria. One article contained two separate studies, both of which met inclusion criteria. Therefore, there were 65 studies examined in total.

The inclusion criteria were applied in the next review stage. A pilot phase was first conducted where two reviewers independently applied the inclusion criteria and extracted data for seven articles and then met to discuss their ratings. An additional 18 articles were then independently reviewed, with 100% agreement for included and excluded articles. The first reviewer then applied the inclusion criteria to the remaining articles. The reference lists of all the included articles were then searched and one additional article meeting inclusion criteria was found.

Thus, a total of 29 articles (30 studies since one article contained 2 studies) met inclusion criteria for this systematic review. Of the 64 articles that were saved from the pre-screening and then reviewed, 3 did not analyze a CBT based treatment, 12 evaluated treatments that were not delivered in group format, 11 did not investigate mediation, 4 were not within the desired age range, 5 did not evaluate psychological outcomes, and 1 article consisted of a family intervention that involved children in the treatment sessions.

Figure 2 outlines the screening process that led to the final 29 articles included in the review. The saved articles were reviewed again to ensure they met inclusion criteria, and then to analyze and extract the relevant information.

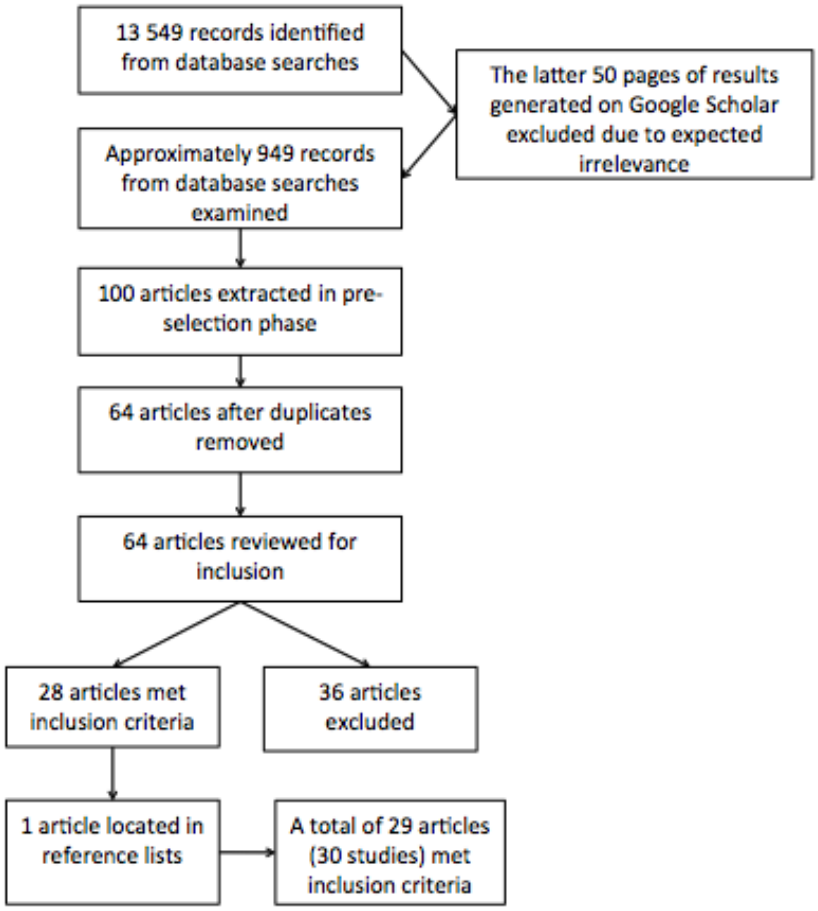

Figure 2. Article screening and selection process.

Data Extraction

During the pilot phase of the review, the two reviewers independently extracted data for seven articles and then met to discuss their ratings. Both reviewers had been unable to extract information from some of the articles due to limitations of the rating scheme. The rating scheme and data record form were altered at this point in order to better address the variety of mediation

models that had been reviewed. Disagreements were resolved by consensus. An interrater reliability analysis was conducted to evaluate the design rating consistency between the two reviewers for the 10 articles that they both extracted data from, which indicated substantial agreement (Kappa = .767, $p < .001$).

The information obtained from articles meeting inclusion criteria included: sample size, mean age of participants, primary diagnosis of participants if applicable, treatment characteristics, whether a treatment fidelity measure was included, the outcome and mediator(s) studied, the predictor in the mediation analyses if applicable, the measures used to assess the outcome(s), mediator(s), and predictor(s), whether there was a control group or not, whether there was random assignment, the type of statistical analysis employed and the study findings. Each study was also rated based on when potential mediation/mechanisms and outcomes were measured during the course of the treatment.

Criteria for Evaluating Methodologies. Kazdin (2007) proposed a system for rating the quality of studies that evaluate mediators based on when the outcome measures are assessed and when the mediator variable is assessed. The present review uses the design categorizations presented by Kazdin (2007), with some slight modifications. As this review only included studies that evaluate a mediation model, Kazdin's first category of studies that assess outcomes but not potential mechanisms was excluded. Thus, the study design categories of 1 to 4 in this paper correspond to Kazdin's categories of 2 to 5. Additionally, an "Other design variations" category was added in order to address mediation designs involving follow-up assessments that did not fit the criteria of categories 1 to 4. Lastly, specifications were added to Kazdin's "Assessment of mechanisms during treatment" category as some designs included additional measurements of potential mediators and

outcomes, but the measurement time points did not meet the criteria of Category 3. The rating scheme used in this review is outlined in Table 11.

Table 11

Study Designs for Evaluating Mechanisms and Outcomes Based on Kazdin's (2007) Categorization

Design categories	**Measurement time points**		
	Pre	**During**	**Post**
1. Concurrent study of mechanisms and outcomes	Mediator and outcome	------	Mediator and outcome
2. Assessment of mechanisms during treatment	Mediator may be measured, Outcome measured	Mediator measured	Mediator may be measured, Outcome measured
3. Assessment of mechanisms and outcomes during treatment	Mediator and outcome	Mediator and outcome	Mediator and outcome
4. Assessment of mechanisms and outcomes all or most sessions	Mediator and outcome	Mediator and outcome measured several times	Mediator and outcome
5. Other design variations	Mediators and/or outcomes assessed during a follow-up period and varying other time points that do align with the above categories		

In accordance with Kazdin's (2007) descriptions of the design categories, Designs 1 and 2 in this review are not able to assess the time sequence of change in the mediator variable compared to change in the outcome variable. The third design is able to capture the time sequence of change in the potential mediator and outcome from pre- to mid- to post- treatment. However, there are still some limitations to Design 3 as the mediator and outcome could change at different rates between the assessment points. Thus, the fourth design is considered the most thorough since it consists of potential mechanisms and outcomes being assessed at almost every

session. This design provides information about the pattern of change in each construct over the course of therapy (Kazdin, 2007).

Data Synthesis

A narrative synthesis of the data was conducted. Following the narrative synthesis recommendations of Petticrew and Roberts (2008), studies were grouped based on design, and then the studies within each category were analyzed and information across the studies was synthesized. Studies were grouped according to their mediation/mechanism measurement rating, and then each of these groups was analyzed to obtain a better understanding of the types of designs within each category. Specifically, the analyses employed, the quality of the methods, and the number of mediators investigated within each study was examined within each design category. Across all studies, all extracted information was synthesized, presented in tables, and discussed. Studies were also grouped with other studies investigating similar outcomes and mediators in order to summarize the information available on a particular construct. This synthesis provides an overall understanding of how mediation and mechanisms of change have recently been measured in the context of group CBT. Thus, the review sought to inform researchers of how change is typically measured, and how methodological improvements can be made in order to enhance the quality of future studies.

Results

Description of the Studies

Sample and Treatment Characteristics. As demonstrated in Table 12, sample and treatment characteristics varied greatly across the 30 included studies. Participants in some studies did not need to meet diagnostic criteria for a particular disorder to be included in the treatment program, while participants in other studies had received psychological or medical

diagnoses such as irritable bowel syndrome (IBS), breast cancer, obsessive-compulsive disorder (OCD), or social anxiety disorder (SAD). As such, the group treatments based on cognitive-behavioural principles all varied in the specific symptoms that they were designed to address. Only one study consisted of parents participating in an intervention to learn parenting skills and improve their children's conduct behaviours. Information regarding medication use among participants during the course of treatment was not available for all of the studies. However, 12 studies explicitly stated that participants taking medication were included, while only 1 study outlined the use of medication in their exclusion criteria. The total sample sizes of the studies ranged from 35 to 353 participants (M = 117.90, SD = 70.08), while participant mean age ranged from 32.00 to 59.40. Treatment durations ranged from 4 to 24 weeks (M = 11.48 weeks, SD = 4.60, mode = 10 and 12 weeks). Number of sessions ranged from 5 to 24, with a mean of 11.98 sessions (SD = 3.89). Ten sessions was most frequently reported though 10 and 12-week programs were equally as common, as some programs allotted more time in between the last sessions and some programs did not run sessions once per week.

Mediator Variables. The types of mediators examined as well as the designs used to assess mediation differed among the articles. Eleven studies examined a cognitive variable as a mechanism of change, while other examined mediators included behavioural and/or affective variables such as fear, engagement, self-efficacy, skills acquired, neurological abilities, avoidance, direction of attention, attachment, group closeness, quality of life, alliance, symptomatology, interpersonal problems, and homework compliance.

Table 12

Summary of All Included Studies

Authors	Sample Size	Mean Age	Primary Diagnosis	Treatment Type[a]	Treatment Duration	Fidelity Measure (Yes or No)
Aderka et al. (2013)	177	37.6	Generalized SAD	GCBT	14 weekly sessions	N
Antoni et al. (2006)	199 (tx group: *n*=107, control group: *n*=92)	50.83	Breast cancer	CBSM	10 weekly 2-hour sessions	N
Delsignore, Carraro, Mathier, Znoj, & Schnyder (2008)	49	35	SAD	GCBT	10 90-min sessions over 3 months	N
Dwyer, Hornsey, Smith, Oei, & Dingle (2011) (STUDY 1)	109	41.67	Anxiety or mood disorder	GCBT for depression, GCBT for anxiety	8 full day sessions over 4 weeks	N
Dwyer et al. (2011) (STUDY 2)	94	45.98	Mood disorders	GCBT for mood	8 sessions over 4 weeks	N
Gallagher-Thompson, Gray, Dupart, Jimenez, & Thompson (2008)	118 (tx group: *n*=97, control group: *n*=87)	57.6	N/A	Coping with Caregiving	Weekly 2 hour sessions for 13-16 weeks	N
Gardner, Burton, & Klimes (2006)	76 families	Not available	Conduct behaviours	Incredible Years program	14 weekly sessions	N
Granholm et al. (2008)	65	53.3	Schizophrenia or schizoaffective disorder	CBSST to improve functioning in people with schizophrenia	24 weekly sessions	Y
Hedman et al. (2013)	94 (tx group: *n*=62)	35.7	SAD	CBGT	15 weekly 2.5-hour sessions	Y
Hoffman (2004)	90 (30 completers in each tx group)	32	Approximately 3/4 had generalized SAD	CBGT	12 weekly sessions	Y
Jonsson, Hougaard, & Bennedsen (2011)	70	32.3	OCD	Group and individual CBT for OCD	15 weekly 2-hour sessions (for the group tx)	N
Kashdan & Roberts (2011)	76	37.8	Depression, some comorbid	Coping with Depression	10 sessions that were 90 min	N

			SAD	course	long (2 were individual, 8 were group format)	
Kwon & Oei (2003)	35	41.3	Depression	GCBT for depression	2-hour weekly sessions for 12 weeks	N
Labus et al. (2013)	69 (tx group: *n*=34, WL: *n*=35)	46.8	IBS	Psychoeducational course for IBS	5 weekly 2-hour sessions	N
Marquez-Gonzalez, Losada, Izal, Perez-Rojo, & Montorio (2007)	39	59.4	N/A	MDTC	8 weekly 2-hour sessions	N
McEvoy, Burgess, & Nathan (2014)	199 (individual CBT: *n* = 84, GCBT: *n* = 115)	37.25	Depression or anxiety disorder	Transdiagnostic GCBT for anxiety or depression, individual CBT	10 weekly 2-hour sessions	N
Moscovitch, Hoffman, Suvak, & In-Albon (2005)	66	32.06	SAD	CBGT for SAD	12 weekly 1.5-hour sessions	N
Meulenbeek, Spinhoven, Smit, Wan Balkom, & Cuijpers (2010)	217 (tx group: *n*=109, control group: *n*=108)	42	Subthreshold or mild panic disorder symptoms	"Don't Panic" course	8 weekly 2-hour sessions	N
Phillips et al. (2011)	128 (tx group: *n*=65, control group: *n*= 63)	49.69	Breast cancer	CBSM	10 weekly 2-hour sessions	N
Phillips et al. (2008)	128 (tx group: *n*=63, control group: *n*= 65)	49.69	Breast cancer	CBSM	10 weekly 2-hour sessions	N
Sawaya (2013)	353	39.2	PTSD or sub-threshold PTSD and drug/alcohol dependence	"Seeking Safety" -group tx for trauma and substance abuse	Twice weekly 75-90 min sessions for 6 weeks	N
Shimotsu et al. (2014)	46	38.57	Neurotic, stress-related and somatoform disorders, mood disorders, other disorders	GCBT for patients with anxiety and depressive symptoms	10 weekly 1-hour sessions	N
Solanto et al. (2010)	88	41.69	ADHD	Meta-cognitive therapy for adult ADHD	12 weekly 2-hour sessions	Y
Smits, Powers, Cho, & Telch (2004)	130 (tx group: *n*=90, control group: *n*=40)	33.93	Panic disorder with agoraphobia	GCBT for panic disorder and agoraphobia	12 2-hour sessions over 8 weeks	Y

Taft, Murphy, King, Musser, & DeDeyn (2003)	107	36.22	N/A	GCBT for partner violent men	16 weekly 2-hour sessions	N
Taft, Murphy, Musser, & Remington (2004)	107	36.22	N/A	GCBT to address abusive behaviour	16 weekly 2-hour sessions	N
Tasca, Balfour, Ritchie, & Bissada, 2006	65	43.86	Binge eating disorder	GCBT or GPIP for binge eating disorder	16 weekly 90-min sessions	N
van Aalderen et al. (2012)	205 (MBCT: *n*=102, TAU: *n*=103)	47.5	Depression	Mindfulness-Based CBT with TAU	8 weekly 2.5-hour sessions	N
Vreeswijk, Spinhoven, Eurelings-Bontekoe, & Broersen (2014)	63	38.12	Axis 1 disorder and/or personality difficulties	Schema Cognitive Behavioural Therapy (SCBT-g)	20 weekly 90-min sessions	N
Westra, Dozois, & Marcus (2007)	67	41.48	Anxiety disorder	GCBT for managing anxiety	10 sessions twice weekly for 2 hours	N

Note. CBSM = cognitive-behavioural stress management; CBSST = Cognitive- Behavioural Social Skills Training; MDTC = Modification of Dysfunctional Thoughts about Caregiving; GPIP = Group Psychodynamic Interpersonal Psychotherapy; HLM = hierarchical linear modeling; tx = treatment; WL = wait-list.

[a]Treatment Type and Treatment Duration are descriptions of the group, cognitive-behaviorally based treatment included in the study. Other treatment groups or control groups are not described in the table.

Study Design. All five of the study design categories outlined in Table 11 were represented in the reviewed studies. Design 1 was used most frequently as 43.33% of the included studies employed this type of research design. The percentages of studies using the remaining designs were as follows: Design 2 = 23.3%, Design 3 = 6.7%, Design 4 = 10.0%, and Design 5 = 16.7%. Table 13 outlines the study characteristics within each design category.

Table 13

Frequencies (%) of Study Characteristics Within the Study Design Categories

Study Characteristic	Study Design				
	1	**2**	**3**	**4**	**5**
	(*n* = 13)	**(*n* = 7)**	**(*n* = 2)**	**(*n* = 3)**	**(*n* = 5)**
Treatment fidelity measured	**3(20.1%)**	**1(14.3%)**	0(0.0%)	**1(33.3%)**	0(0.0%)
Control group	**9(69.2%)**	**1(14.3%)**	0(0.0%)	0(0%)	**3(60.0%)**
Random assignment	**9(69.2%)**	**3(42.9%)**	0(0.0%)	**1(33.3%)**	**4(80.0%)**
Statistical Analysis[a]					
Baron & Kenny	**4(30.8%)**	**4(57.1%)**	0(0.0%)	**1(33.3%)**	**1(20.0%)**
Linear regression based on Kraemer's recommendations	**2(15.4%)**	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Sobel	**2(15.4%)**	**3(42.9%)**	0(0.0%)	**1(33.3%)**	0(0.0%)
Other Product of Coefficients tests	**3(20.1%)**	**1(14.3%)**	0(0.0%)	**1(33.3%)**	**1(20.0%)**
Difference in coefficients	**2(15.4%)**	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Bootstrapping	**3(20.1%)**	**1(14.3%)**	0(0.0%)	**1(33.3%)**	**2(40.0%)**
SEM	**1(7.7%)**	0(0.0%)	**1(50.0%)**	0(0.0%)	**1(20.0%)**
Path analysis	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	**1(20.0%)**
Regression to test the indirect effect	0(0.0%)	**1(14.3%)**	0(0.0%)	0(0.0%)	0(0.0%)
Hierarchical regressions	**1(7.7%)**	0(0.0%)	**1(50.0%)**	0(0.0%)	0(0.0%)
Effect size	0(0.0%)	**1(14.3%)**	0(0.0%)	0(0.0%)	**1(20.0%)**

[a]Several studies used more than one of the listed statistical analyses

Statistical Analyses. Overall, product of coefficients approaches, which include the Sobel test, were used most often (by 40.0% of the studies), followed by the Baron and Kenny approach (33.3%), and then bootstrapping (23.3%).

Quality of Methods. The quality of the methodologies used in terms of treatment fidelity, the use of a control group, and random assignment to conditions was examined across the design categories. Treatment fidelity measurement and inclusion of a control group were most common within the Design 1 category, while random assignment was most common among the Design 5 studies (see Table 13). None of the studies using designs that can detect temporal antecedence of a mediator variable (Designs 3 and 4) used control groups, although one of these studies compared the group treatment to individual treatment. Overall, these characteristics were not commonplace among the studies, as only 16.7% of all the included studies used a treatment fidelity measure, 43.3% used a control group, and 56.7% used random assignment.

Design 1. Studies falling within the first design category were generally very similar in structure as both the potential mediators and outcomes were measured at pre- and post-treatment. One of the studies within this category (Granholm et al., 2008) assessed the outcome and mediator concurrently during a follow-up period instead of immediately after treatment completion, so the follow-up measurement was treated as a post-treatment measure. Additionally, the Antoni et al. (2006) study assessed a mediator and outcomes at the pre-, post-, and follow-up periods. This study was categorized as a Design 1 study since there were no assessments during the course of therapy. Almost half of the studies within this category (46.2%) assessed more than one potential mechanism. The most frequently used statistical analyses within this category were the Baron and Kenny approach, product of coefficients tests, and bootstrapping (see Table 13).

Design 2. Within the Design 2 category, three studies evaluated outcomes at pre- and post- treatment only, while the potential mediator was assessed only once during the course of the treatment. Other methodologies that were still classified as a Design 2 included studies where the outcomes are measured multiple times, but the mediator is only measured once during treatment (e.g., Westra et al., 2007) and studies where the mediator is measured multiple times but the outcomes are only measured pre- and post- treatment (e.g., Dwyer et al., 2011(Study 2); Tasca et al., 2006). Four of the studies within this category (57.1%) examined more than one potential mediator. The Baron and Kenny approach and Sobel test were used often among Design 2 studies.

Design 3. The two studies included in this category used the exact same design where potential mediators and outcomes were assessed at pre-, mid-, and post-treatment. Neither of the two studies examined more than one potential mediator. SEM and hierarchical regression were used by the Design 3 studies.

Design 4. None of the studies assessed variables at 'most' sessions as all three of the studies included in this category assessed potential mediators and outcomes at every single session. The Hedman et al. (2013) and Kashdan and Roberts (2011) studies assessed multiple mediators, while the Moscovitch et al. (2005) article analyzed one mediator of change in an outcome and then conducted another mediation model where the mediator and outcome variables were switched. Each of these three studies used multilevel models in their statistical analysis in order to address the session-by-session changes for each participant. Design 4 studies employed Baron and Kenny, Sobel test, other product of coefficients tests, and bootstrapping.

Design 5. Four of the reviewed studies were included in this category since they did not involve a pre-treatment measurement of outcomes. The Phillips et al. (2011), Phillips et al.

(2008), and Sawaya et al. (2013) studies examined change in a variable during treatment as a mediator of change during the post-treatment to follow-up period only. The study by Taft and colleagues (2004) examined a potential mechanism of change for the relationship between a pre-treatment variable (psychopathic traits) and a variable measured towards the end of treatment (therapeutic alliance). In this model, the outcome variable was not measured at baseline so the potential mediator was not being investigated as a mediator of change during treatment. Lastly, the Labus et al. (2013) article examined outcomes from pre- to follow-up treatment only, while the potential mediators were assessed at different time points. Generally, the articles in this category did not fit Designs 1 to 4 due to the focus on the follow-up period. Forty percent of these studies investigated more than one mediator. Studies in the Design 5 category most frequently used bootstrapping.

Article Findings Grouped by Treatment Type, Outcomes Studied, and Mediators Studied

As 18 studies examined a mediator within GCBT for anxiety or depression (see Table 14 for study details), patterns and trends among these studies were examined. Five of the articles involved patients with Social Anxiety Disorder (SAD) diagnoses, and four of these involved a treatment that was specifically tailored to address SAD symptoms. It is important to note that the following summaries of study findings may state that mediation was supported, but these findings are actually referring to statistical mediation being supported. Within the SAD-focused studies, significant mediators of symptom improvement from pre- to post- treatment included changes in one's thoughts about the negative consequences of social situations (estimated social cost; Hoffman, 2004), changes in self-focused attention and anticipatory and post-event processing (Hedman et al., 2013), and fear at mid-treatment as a mediator of changes in avoidance (Aderka et al., 2013). Anticipatory processing refers to thoughts preceding a social

situation where the encounter is expected to be negative, while post-event processing refers to replaying social situations after they occur (as cited in Hedman et al., 2013). Additionally, session-by-session social anxiety symptoms were examined as a mediator and were shown to mediate the session-by-session improvements in depressive symptoms (Moscovitch et al., 2005). A fourth study that focused on GCBT for SAD found that the relationship between baseline perceived internal control about change in therapy and post-treatment symptom outcomes was partially mediated by therapy-related self-efficacy and therapy engagement for patients with SAD (Delsignore et al., 2008). Evidently, there is high variability in the mediators examined for patients with SAD who are receiving GCBT. Only two of the SAD-focused studies (Hedman et al., 2013; Moscovitch et al., 2005) used designs that are able to address the temporal sequence of change.

Five studies evaluated mediation of treatment for mood or depression. Three of these studies investigated similar mediator variables, while all five studies included depressive symptoms as at least one of the outcome measures. However, the Dwyer et al. (2011), Kashdan and Roberts (2011), and Kwon and Oie (2003) studies used a predictor variable in their models that differed from the outcome variables. Thus, these articles do not specifically address a mediator of the change in depressive symptoms from pre- to post- treatment. The variability in the mediation models of these three articles precludes the ability to compare their findings. Of the remaining two articles, both found support for skills as mediators of change in depressive symptoms, while one also found support for cognitive variables as mediators of change. More specifically, van Aalderen et al. (2012) found worry, rumination, and an increase in the mindfulness skill, “accept without judgement”, to significantly mediate change in depression following a mindfulness-based CBT. Gallagher-Thompson and colleagues (2008) found skill

effectiveness to mediate the relationship change in depressive symptoms following a Coping with Caregiving course for people who are caretakers of family members with dementia. Again, though these five studies consisted of patients with depressive symptoms who received group treatment based on cognitive-behavioural principles for depression, and depressive symptoms were used as the outcome variables, there was little overlap in the mediation models due to the different predictors and mediators examined.

Homework was analyzed as mediator of treatment outcomes in three of the reviewed studies. Each of the therapies in these studies differed regarding the symptoms they were designed to address. Thus, homework was investigated as a mediator of different variables, including change in inattention for adults with ADHD (Solanto et al., 2010), the relationship between early therapist alliance ratings and reduced psychological abuse following CBT for partner violent men (Taft et al., 2004), and the relationship between pre-treatment expectancy for anxiety symptoms to change and initial symptom change (Westra et al., 2007). Homework completion was statistically supported as a potential mediator in the Solanto et al. and Westra et al. studies, while it was a partial mediator in the study by Taft and colleagues. These three studies were all included in the Design 2 category, so findings should be interpreted along with the limitations of the designs.

Table 14

Mediation Analyses Examining Change in CBT for Anxiety and Depression

Authors	Control Group	Comparison Treatment Group	Randomization to Groups? (Yes or No)	Mediation measures	Outcome measures	Statistical Analysis	Rating[a]
Aderka et al. (2013)	N	N/A	Y	BSPS- fear subscale	BSPS -avoidance subscale	Bootstrapping	2
Delsignore et al. (2008)	N	N/A	N	Bernese scale completed by the therapist and a subscale of the TBK	LSAS, Generalized Self-Efficacy Scale, SCL-K-9	Baron & Kenny, Sobel test	2
Dwyer et al. (2011) (STUDY 1)	N	N/A	N	CCL-A and CCL-D	ZSDS, BAI, QOLI	Sobel test	1
Dwyer et al. (2011) (STUDY 2)	N	N/A	N	CCL-D	BDI	Multilevel modeling and Sobel test	2
Gallagher-Thompson et al. (2008)	Y	N/A	Y	SUQ	CES-D, PSS-10, RMBPC-CB	Z scores, Sobel test	1
Hedman et al. (2013)	N	Individual CT	Y	4 subscales of the SPWSS	Social anxiety item on the SPWSS	Moderated mediation and product of coefficients	4
Hoffman (2004)	Y	Exposure group therapy	N	SCQ	SPAI	Linear regression following Kraemer's recommendations, difference in coefficients	1
Jonsson et al. (2011)	N	N/A	Y	RAS, TAFS	Y-BOCS	Causal steps	1
Kashdan & Roberts (2011)	N	N/A	N	FAQ, ECR, IOS	BDI-II	Bootstrapping with individual growth curves and linear regressions	4
Kwon & Oei (2003)	N	N/A	N	ATQ	BDI, DAS	SEM	3
Marquez-Gonzalez et al. (2007)	Y	Y	Y	DTCQ	CES-D	Baron & Kenny	1
McEvoy, et al. (2014)	N	Individual CBT	N	HAq-II	BDI-II, BAI	Bootstrapping	1

Moscovitch et al. (2005)	N	N/A	N	1) LSAS 2) BDI	1) BDI, 2) LSAS	Multilevel growth curve modelling, Baron & Kenny, Sobel test	4
Meulenbeek et al. (2010)	Y	N/A	Y	PAI-anticipation, PAI-consequences, PAI-coping, and MASTERY	PDSS-SR, HADS-ANX, and MI	Baron & Kenny with bootstrapping	1
Sawaya et al. (2013)	N	Psychoeduc-ational group	Y	PSS-SR from week 4-6	CAPS	Longitudinal growth models within SEM	5
Smits et al. (2004)	Y	N	Y	ASI, BSQ	Texas Panic Attack Record Form, SPRAS, FQ-Ago, SDS	Baron & Kenny	1
Van Aalderen et al. (2012)	Y	N/A	Y	Rumination on Sadness Scale, PSWQ, KIMS	HAMD	Preacher and Hayes (2008) recommendations and bootstrapping	1
Westra et al. (2007)	N	N/A	N	1) Homework scale developed by authors, 2) one standard deviation reduction in symptoms	ASI, FNEB, PSWQ, BDI-II	Baron & Kenny, Goodman's unbiased solution	2

Note. BSPS = The Brief Social Phobia Scale, Scale TBK = Questionnaire on Control Expectancies in Psychotherapy, LSAS = Liebowitz Social Anxiety Scale, SCL-K-9 = Symptom-Checklist, CCL-A = Cognitions Checklist – anxiety subscale, CCL-D = Cognitions Checklist – depression subscale, ZSDS = Zung Self Rating Depression Scale, BAI = Beck Anxiety Inventory, QOLI = Quality of Life Inventory, BDI = Beck Depression Inventory, SUQ = Skill Utilization Questionnaire CES-D = Centre for Epidemiological Studies - Depression Scale, PSS- 10 = Perceived Stress Scale, RMBPC = Revised Memory and Behaviour Problem Checklist – Conditional Bother, SPWSS = Social Phobia Weekly Summary Scale, SCQ = Social Cost Questionnaire, SPAI = Social Phobia and Anxiety Inventory, RAS = Responsibility Attitude Scale, TAFS = Thought Action Fusion scale (TAFS), Y-BOCS = Yale-Brown Obsessive Compulsive Scale, FAQ = Focus of Attention Questionnaire, ECR = Experiences in Close Relationships Inventory, IOS = Inclusion of Other in the Self Scale, BDI-II = Beck Depression Inventory-II, ATQ = Automatic Thoughts Questionnaire, DAS = Dysfunctional Attitudes Scales, DTCQ = Dysfunctional Thoughts about Caregiving Questionnaire, HAq-II = Helping Alliance Questionnaire 2, PAI = Panic Appraisal Inventory, PDSS-SR = Panic Disorder Severity Scale – Self Report, HADS-ANX = Hospital Anxiety and Depression Scale –anxiety subscale, MI = Mobility Inventory, CAPS = Clinician-Administered PTSD Scale (CAPS), ASI = Anxiety Sensitivity Index, BSQ = Body Sensations Questionnaire, SPRAS = Sheehan Patient-Rated Anxiety Scale, FQ-Ago = Fear Questionnaire – Agoraphobia scale, SDS = Sheehan Disability Scale, PSWQ = Penn State Worry Questionnaire, KIMS = Kentucky Inventory of Mindfulness, HAMD = Hamilton Rating Scale for Depression, , FNEB = Fear of Negative Evaluation Scale Brief Version

[a] Ratings are as follows: 1 = Concurrent study of mechanisms and outcomes, 2 = Assessment of mechanisms during treatment, 3 = Assessment of mechanisms and outcomes during treatment, 4 = Assessment of mechanisms and outcomes at all or most sessions, 5 = Other design variations

Findings within the Highly Rated Mediation Designs

The highest quality mediation studies are ones that use level 3 or 4 designs in order to address the temporal sequence of change in the mediator and outcomes, while also comparing to a control group, using randomization, and assessing treatment fidelity. Of the Design 3 and 4 categories, only one study met most of these criteria. The aforementioned Hedman et al. (2013) article compared GCBT and Individual Cognitive Therapy for SAD, randomly assigned participants to groups, and measured treatment fidelity. The quality of this study was further enhanced by their assessment of multiple mediators. Multilevel moderated mediation analyses were used to take into account the session-by-session changes in social anxiety and the potential mediators, and a product of coefficients test was used to evaluate the significance of the indirect effect. For the GCBT condition, changes in self-focused attention and in anticipatory and post-event processing mediated the changes in social anxiety. This study has been described in detail since its high-quality nature provides strong support for its findings. Nevertheless, other criteria as outlined by Kazdin (2007) are still required in order to determine whether changes in self-focused attention and anticipatory and post-event processing are true mechanisms of change in GCBT for SAD.

Discussion

This review examined study design characteristics for published articles examining mediators of GCBT for adults from the year 2000 to the present time. Mechanisms of change have been evaluated with designs that range from measuring mediators and outcomes at pre- and post- treatment only, to measuring mediators and outcomes at every session. However, the most frequently used design was one that consists of potential mediators and outcomes measured at pre- and post- treatment only. The second most commonly used design was one where outcomes

were measured pre- and post- treatment with the potential mediator measured during treatment only. Considering how both of these designs are unable to distinguish the temporal patterns of change in the mediator compared to outcome variables (Kazdin, 2007), the results cannot conclusively demonstrate mediation even if the statistical analysis was significant. As only three studies employed designs where the mediator and outcomes were measured at every session, there is a need for more studies to use these types of rigorous designs. This finding is consistent with the assertions of Johanson and Hogeland (2003), as well as Kazdin (2007), who have all bolstered the need for mediation analyses to use designs that take temporal sequence into account.

Similarly, two of Kazdin's (2007) other criteria for establishing mediation, specificity and consistency, were not always demonstrated. The specificity criterion, which entails a need for other potential mediators to be examined and not supported, was addressed by 13 of the studies in this review. Thus, 13 studies examined multiple mediators while 17 assessed a single mediator. Support of the consistency criterion was not evident in this review, as there was very little overlap in the types of mediators assessed. There seems to be no exact replication of results among the 30 studies. This could be due to the fact that the review is limited by a group format of CBT. It may also indicate a tendency for journals to publish novel research at the expense of replication research. Perhaps mediation analyses have been conducted in individually delivered CBT that could provide further support of the potential mediators recognized within the studies in this review.

There was wide variation among studies analyzing GCBT, further highlighting the need for replication. For example, there were five studies investigating mediators of change in GCBT for SAD, five studies examining mediators of change for depression, and three studies examining

homework compliance as a mediator of change, yet there were few similarities across the studies within these groups. However, the variation among the reviewed studies, such as the different types of cognitive-behaviourally based interventions that are designed to address an array of psychological and physical symptoms, underscores the wide application and utility of cognitive-behavioural principles. Even though this variation precluded drawing conclusions about specific mediators in the present review, it also draws attention to the many ways that features of CBT are applied.

Studies within the Design 3 and 4 categories were expected to provide the highest level of evidence for mechanisms of change in GCBT. However, it was apparent that few of these studies used other high-quality methods such as comparison to a control group, randomization, or inclusion of a treatment adherence measure. Therefore, despite using more sophisticated methods for evaluating mediation, some studies did not use other strong methodological features that are necessary in order to identify true mechanisms of change. This finding concurs with Kraemer, Wilson, Fairburn, and Agras' (2002) observation, who highlighted the dearth of randomized controlled trials (RCTs) investigating mediators of treatment outcomes. Kraemer and colleagues referred to uncontrolled studies as merely "hypothesis-generating" since they cannot provide robust evidence but they can provide helpful information regarding which potential mediators should be further evaluated in "hypothesis-testing studies" (RCTs). According to this logic, the current literature regarding change in GCBT could be viewed mostly "hypothesis-generating" in nature, since the potential mechanisms identified in the Design 3 and 4 studies should be further evaluated with rigorous methodologies.

Additionally, review of the statistical mediation analyses used in each of the articles indicated some room for improvement, as causal steps methods and some product of coefficients

tests that assume a normal distribution were frequently used in place of more appropriate statistical techniques. However, bootstrapping approaches - which have fewer limitations - were also used by a large number of studies. Some other more contemporary statistical approaches were also evident in the reviewed studies.

The disconnect between the best research methods for assessing mediation and how mediation is actually assessed in current literature may stem from the practical limitations of measuring mediating and outcome variables during the course of therapy. Researchers utilizing organization-based treatment groups (i.e., "clinical data") use clients as participants. Competing priorities and demands may influence the feasibility of the research project. For example, the observed tendency to have participants complete measures at pre- and post-treatment only, may be due to concerns about time restrictions, rapport with the clients, or worry of placing additional "burden" on clients. Alternatively, some clients may not wish to complete measures at every session. In general, the nature of clinical data collection is fraught with several barriers. Many treatment programs are delivered within a larger mental health clinic or hospital that has regulations, policies, and ethical guidelines in place that may impact how and when data is able to be collected. Sometimes concerns are raised about the impact of completing a questionnaire on patients' symptoms (Valderas et al., 2008), or the ethics of collecting clinical data when sample sizes will be small and analyses may lack power (Halpern et al., 2002). Another reality of clinical data collection is that using control groups and randomization may not always be possible. Considering the plethora of barriers to this type of research, it seems as though selecting very brief measures to address multiple mediators would be particularly important when attempting to assess potential mediators of change in treatment at every session.

Limitations

Though this review provides insight regarding the state of mediation analyses within GCBT, there are some noteworthy limitations. First, the review may be impacted by publication bias, as 29 of the included studies were articles that had been published in a journal, while one study was a dissertation published online. Although the initial search included online resources that do not only contain peer-reviewed, published articles, an extensive search of unpublished work was not conducted. The potential limitation this poses is that only studies with "positive results" were published.

A second methodological limitation involves the reviewing process. It is a strength of the study that a second reviewer also rated articles, but it is a limitation that there were 40 articles reviewed by only one reviewer. In addition, the interrater reliability analysis was conducted of the study design ratings only. The other extracted information was examined for differences and corrected when disagreements occurred, but that information was not included in a reliability analysis. However, this extracted data was factual in nature and did not require rating or interpreting the information, thus reducing the likelihood of inference-related extraction errors.

Future Research

As there was very little overlap among the mediation variables studied in all 30 mediation models, there is certainly a need to replicate findings. In particular, the potential mediators supported by rigorous session-by-session measurement methods (i.e., the results of Hedman et al., 2013 and Moscovitch et al., 2005) could become supported as true mediators, if these results were replicated several times. As some evidence has suggested there could be different mechanisms of change at work in group psychotherapy compared to individually-delivered formats, it is important for mediation to be examined further in the group treatment context.

Moreover, the characteristics of the reviewed studies suggests that future researchers assessing statistical mediation should be particularly cognizant of the design they use, so that designs are selected that can detect temporal antecedence of the mediator. The type of statistical mediation analysis should also be thoroughly considered, as some of the most widespread techniques may not adequately assess indirect effects. Finally, authors' description of study methods could also become more explicit. For example, the importance of clearly reporting when participants completed each measure, reporting which measurement time points were used in mediation analyses, and reporting when change score were being used, was noted in this review process. Future research should attempt to explicitly outline this information so that readers are better able to interpret results and the temporal sequence addressed in the mediation model.

Conclusion

Assessing potential mediators or mechanisms of change is essential to understanding what it is that works in GCBT. The findings of this review highlight the need for Kazdin's (2007) criteria for establishing mediation to be addressed in current research designs. In particular, the principles of temporal sequence, specificity, and consistency appear to be in great need of consideration when conducting mediation research. As this review found that the more sophisticated mediation designs lack other methodological features, there is also a need for RCTs that assess potential mediators and outcomes at every session. Despite the noted areas for improvement and directions for future research, important information has been generated by each of the reviewed studies. Identifying mechanisms of change is a process that occurs overtime through continuous hypothesis building, testing, and replication of results. The current GCBT mediation literature provides a foundation for future studies to build upon in order to

identify true mediators of change, and then to ultimately understand the mechanisms that lead to change during therapy.

Overall Conclusions

This thesis sought to better understand how change occurs in GCBT for anxiety and how change is measured in recent literature. Two studies were conducted to address these objectives. The first study did not find support for cognitive change as a mediator of anxiety treatment outcomes, nor did it support homework as a moderator of treatment outcomes. However, the small sample size was a significant limitation to this study. The systematic review of recent literature found that several published articles demonstrated that cognitive, affective, and behavioural variables mediate changes during GCBT for anxiety. However, the reviewed studies at best demonstrated statistical mediation and generally were not designed in a way that could establish mediation in a broader sense. In both GCBT for anxiety and general GCBT, there remains a need to better understand how therapy leads to improved outcomes.

Overall, the two conducted studies highlight the limitations of clinical research and data collection, while also presenting ways of improving this research. There remains a need for future studies to adequately assess mediation and evaluate the efficacy and effectiveness of GCBT for anxiety.

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Appendices

Appendix A Information

Letter for Time 1

Study: Outcomes for group treatment of anxiety

Investigators: Ms. Erika Portt and Dr. Amanda Maranzan, Lakehead University

January 1, 2014

Dear Potential Participant:

My name is Erika Portt and I am a graduate student in the Clinical Psychology program at Lakehead University. I am currently working on a research project under the supervision of Dr. Amanda Maranzan. You have been contacted because you were referred for an anxiety group at St. Joseph's Care Group. St. Joseph's Care Group is partnering with Lakehead University to conduct this research study, and we invite you to participate. The purpose of the study is to find out the effects of the anxiety group. In order to find this out, we are inviting participation from clients who are currently in the anxiety group.

Do I have to participate?

No, you don't have to participate in this study. If you decide not to participate, it will not affect your course of treatment at St. Joseph's Care Group – you will still receive treatment. If you choose to participate, it is your own voluntary decision. You can refuse to participate in any or all parts of the study and you can withdraw from the study at any time (by contacting the researchers or not completing the questionnaires). You don't have to answer any questions that you don't want to.

What will I be asked to do?

You will be asked to fill out a questionnaire asking about demographic information (e.g., your age, sex, cultural affiliation). You will also be asked to fill out some questionnaires that ask about how you have been feeling (e.g., symptoms of anxiety, depression, panic, and thoughts about anxiety). In total, this will take you about 20 minutes. Halfway through the treatment and when the therapy group ends, you will be asked to complete the questionnaire packages a second and third time, which will again take about 20 minutes each time. Therefore, participation would consist of completing the questionnaires three times for 20 minutes each time, during the period that you are attending the therapy group. We are also requesting to access the three questionnaires that you complete for program evaluation (the Beck Anxiety Inventory, the Beck Depression Inventory and the Penn State Worry Questionnaire). We would match your program evaluation questionnaires to your questionnaire packages using a self-generated code so that your answers remain anonymous. Agreeing to participate therefore consists of completing the questionnaire packages and allowing the researchers to access three measures that you complete during the group. If you decide to participate, please complete the attached questionnaires and mail the package to the researchers using the pre-addressed and stamped envelope. If you do not want to participate, please do not complete or mail the questionnaires. By mailing in your questionnaire package, it will be assumed that you are consenting to participate in the study.

Because the questionnaire asks about how you have been feeling, you may become more aware of emotional distress. If you become upset because of completing the questionnaire, please let the group leader know, or contact Intake at St. Joseph's Care Group (807-624-3400).

To thank you for your participation, you have the option of receiving a $10.00 gift certificate for completing the questionnaires at all three data collection times. A separate, small form (provided) can be completed and returned to the researcher with your name and mailing address, to indicate each time that you complete a questionnaire package.

How will my information be handled?

The information we learn from this project will be used for a Master's thesis at Lakehead University (Erika Portt). It will also be used to improve approaches to how we help people with anxiety disorders.

All of the information you provide will be kept confidential. At no point will your name be associated with the information you provide. Your responses on the questionnaires will not be identifiable, and all data will be presented and published in aggregate (group) format. The contact information provided on a separate form will be used to mail the gift certificate to you, and to contact you for the follow-up questionnaire completion. However, this identifying form will not be associated with your questionnaire responses.

Only the researcher team will have access to the data – no one at St. Joseph's Care Group will be able to see your questionnaire packages. Your data will be stored in a locked filing cabinet at Lakehead University for a period of five years, and then destroyed.

What if I want further information?

If you want further information about this study, you can contact Ms. Erika Portt by telephone at (613) 243-8955 or by email at eportt@lakeheadu.ca. You can also contact Dr. Amanda Maranzan (supervisor) by telephone at (807) 343-8322 or by email (amaranzan@lakeheadu.ca). This research study has been reviewed and approved by the St. Joseph's Care Group Research Ethics Board and Lakehead University Research Ethics Board. If you think that your rights as a participant have been violated you can contact St. Joseph's Care Group Research Ethics Board for more information: Chair, Research Ethics Board St. Joseph's Care Group 580 N. Algoma St., Thunder Bay, Ontario P7B 5G4 phone: 807-343-4300 ext. 4723 fax: 807-343-4376, email contact for REB Chair: REB_Chair@tbh.net. You may also contact the Lakehead University Research Ethics Board for more information: 807-766-7289.

If you would like a summary of the research results, please indicate so on the small form included in the questionnaire package. A summary will be sent to you at the end of the study (September 2014).

Thank you for considering participating in this study.

Erika Portt, M.A. Student

Amanda Maranzan, Assistant Professor

Lakehead University

Community Resources:

Thunder Bay Crisis Response Service

(807) 346-8282

Mental health workers provide support 24 hours a day and can help you to access further services, as needed

Thunder Bay Counselling Centre

(807) 684-1880

Mental health workers provide counseling to individuals, couples, and families

Beendigen Crisis Line

(807) 346-HELP

(807) 346-4357

Mental Health Assessment Team

At the Emergency Department (Thunder Bay Regional Health Sciences Centre)

Mental health workers will assess your emergency mental health needs

Thunder Bay Sexual Assault/Abuse Crisis Service

(807) 344-4502

Crisis workers are available 24 hours to give immediate help, as well as follow-up counseling, court advocacy and other services. Phone support for women who have experienced current ot past assault or abuse.

Walk-in Counsellign Services –Wednesdays from 12 noon to 8 pm

-1st & 3rd Wednesday each month at –Thunder Bay Counselling Centre – 544 Winnipeg Avenue

-2nd & 4th Wednesday each month at Children's Centre Thunder Bay – 283 Lisgar Street

Appendix B Information

Letter for Time 2

Study: Outcomes for group treatment of anxiety

Investigators: Ms. Erika Portt and Dr. Amanda Maranzan, Lakehead University

January 1, 2014

Dear Potential Participant:

You have been contacted because you were referred for an anxiety group at St. Joseph's Care Group. St. Joseph's Care Group is partnering with Lakehead University to conduct this research study, and we invite you to participate. The purpose of the study is to find out the effects of the anxiety group. In order to find this out, we are inviting participation from clients who are currently in the anxiety group.

Note: As this is Time 2 of the study (mid-treatment), please **do not** complete the questionnaires in this package if you did not participate at Time 1. Time 1 consisted of filling out the questionnaire packages after the first therapy session.

If you did participate at Time 1, we invite you to complete the questionnaires a second and third time.

Do I have to participate?

No, you don't have to participate in this study. If you decide not to participate, it will not affect your course of treatment at St. Joseph's Care Group – you will still receive treatment. If you choose to participate, it is your own voluntary decision. You can refuse to participate in any or all parts of the study and you can withdraw from the study at any time (by contacting the researchers or not completing the questionnaires). You don't have to answer any questions that you don't want to.

What will I be asked to do?

You will be asked to fill out a questionnaire asking about demographic information (e.g., your age, sex, cultural affiliation). You will also be asked to fill out some questionnaires that ask about how you have been feeling (e.g., symptoms of anxiety, depression, panic, and thoughts about anxiety). In total, this will take you about 20 minutes. Halfway through the treatment and when the therapy group ends, you will be asked to complete the questionnaire packages a second and third time, which will again take about 20 minutes each time. Therefore, participation would consist of completing the questionnaires three times for 20 minutes each time, during the period that you are attending the therapy group.

We are also requesting to access the three questionnaires that you complete for program evaluation (the Beck Anxiety Inventory, the Beck Depression Inventory and the Penn State Worry Questionnaire). We would match your program evaluation questionnaires to your questionnaire packages using a self-generated code so that your answers remain anonymous. Agreeing to participate therefore consists of completing the questionnaire packages and allowing the researchers to access three measures that you complete during the group. If you decide to participate, please complete the attached questionnaires and mail the package to the researchers using the pre-addressed and stamped envelope. If you do not want to participate, please do not complete or mail the questionnaires. By mailing in your questionnaire package, it will be assumed that you are consenting to participate in the study.

Because the questionnaire asks about how you have been feeling, you may become more aware of emotional distress. If you become upset because of completing the questionnaire, please let the group leader know, or contact Intake at St. Joseph's Care Group (807-624-3400).

To thank you for your participation, you have the option of receiving a $10.00 gift certificate for completing the questionnaires at all three data collection times. A separate, small form (provided) can be completed and returned to the researcher with your name and mailing address, to indicate each time that you complete a questionnaire package.

How will my information be handled?

The information we learn from this project will be used for a Master's thesis at Lakehead University (Erika Portt). It will also be used to improve approaches to how we help people with anxiety disorders.

All of the information you provide will be kept confidential. At no point will your name be associated with the information you provide. Your responses on the questionnaires will not be identifiable, and all data will be presented and published in aggregate (group) format. The contact information provided on a separate form will be used to mail the gift certificate to you, and to contact you for the follow-up questionnaire completion. However, this identifying form will not be associated with your questionnaire responses.

Only the researcher team will have access to the data – no one at St. Joseph's Care Group will be able to see your questionnaire packages. Your data will be stored in a locked filing cabinet at Lakehead University for a period of five years, and then destroyed.

What if I want further information?

If you want further information about this study, you can contact Ms. Erika Portt by telephone at (613) 243-8955 or by email at eportt@lakeheadu.ca. You can also contact Dr. Amanda Maranzan (supervisor) by telephone at (807) 343-8322 or by email (amaranzan@lakeheadu.ca). This research study has been reviewed and approved by the St. Joseph's Care Group Research Ethics Board and Lakehead University Research Ethics Board. If you think that your rights as a participant have been violated you can contact St. Joseph's Care Group Research Ethics Board for more information: Chair, Research Ethics Board St. Joseph's Care Group 580 N. Algoma St., Thunder Bay, Ontario P7B 5G4 phone: 807-343-4300 ext. 4723 fax: 807-343-4376, email contact for REB Chair: REB_Chair@tbh.net. You may also contact the Lakehead University Research Ethics Board for more information: 807-766-7289.

If you would like a summary of the research results, please indicate so on the small form included in the questionnaire package. A summary will be sent to you at the end of the study (September 2014).

Thank you for considering participating in this study.

Erika Portt, M.A. Student

Amanda Maranzan, Assistant Professor

Lakehead University

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Appendix C Information

Letter for Time 3

Study: Outcomes for group treatment of anxiety

Investigators: Ms. Erika Portt and Dr. Amanda Maranzan, Lakehead University

January 1, 2014

Dear Potential Participant:

You have been contacted because you were referred for an anxiety group at St. Joseph's Care Group. St. Joseph's Care Group is partnering with Lakehead University to conduct this research study, and we invite you to participate. The purpose of the study is to find out the effects of the anxiety group. In order to find this out, we are inviting participation from clients who are currently in the anxiety group.

Note: As this is Time 3 of the study (end of treatment), please **do not** complete the questionnaires in this package if you did not participate at Time 1. Time 1 consisted of filling out the questionnaire packages after the first therapy session.

If you did participate at Time 1, we invite you to complete the questionnaires at this time.

Do I have to participate?

No, you don't have to participate in this study. If you decide not to participate, it will not affect your course of treatment at St. Joseph's Care Group – you will still receive treatment. If you choose to participate, it is your own voluntary decision. You can refuse to participate in any or all parts of the study and you can withdraw from the study at any time (by contacting the researchers or not completing the questionnaires). You don't have to answer any questions that you don't want to.

What will I be asked to do?

You will be asked to fill out a questionnaire asking about demographic information (e.g., your age, sex, cultural affiliation). You will also be asked to fill out some questionnaires that ask about how you have been feeling (e.g., symptoms of anxiety, depression, panic, and thoughts about anxiety). In total, this will take you about 20 minutes. Halfway through the treatment and when the therapy group ends, you will be asked to complete the questionnaire packages a second and third time, which will again take about 20 minutes each time. Therefore, participation would consist of completing the questionnaires three times for 20 minutes each time, during the period that you are attending the therapy group.

We are also requesting to access the three questionnaires that you complete for program evaluation (the Beck Anxiety Inventory, the Beck Depression Inventory and the Penn State Worry Questionnaire). We would match your program evaluation questionnaires to your questionnaire packages using a self-generated code so that your answers remain anonymous. Agreeing to participate therefore consists of completing the questionnaire packages and allowing the researchers to access three measures that you complete during the group. If you decide to participate, please complete the attached questionnaires and mail the package to the researchers using the pre-addressed and stamped envelope. If you do not want to participate, please do not complete or mail the questionnaires. By mailing in your questionnaire package, it will be assumed that you are consenting to participate in the study.

Because the questionnaire asks about how you have been feeling, you may become more aware of emotional distress. If you become upset because of completing the questionnaire, please let the group leader know, or contact Intake at St. Joseph's Care Group (807-624-3400).

To thank you for your participation, you have the option of receiving a $10.00 gift certificate for completing the questionnaires at all three data collection times. A separate, small form (provided) can be completed and returned to the researcher with your name and mailing address, to indicate each time that you complete a questionnaire package.

How will my information be handled?

The information we learn from this project will be used for a Master's thesis at Lakehead University (Erika Portt). It will also be used to improve approaches to how we help people with anxiety disorders.

All of the information you provide will be kept confidential. At no point will your name be associated with the information you provide. Your responses on the questionnaires will not be identifiable, and all data will be presented and published in aggregate (group) format. The contact information provided on a separate form will be used to mail the gift certificate to you, and to contact you for the follow-up questionnaire completion. However, this identifying form will not be associated with your questionnaire responses.

Only the researcher team will have access to the data – no one at St. Joseph's Care Group will be able to see your questionnaire packages. Your data will be stored in a locked filing cabinet at Lakehead University for a period of five years, and then destroyed.

What if I want further information?

If you want further information about this study, you can contact Ms. Erika Portt by telephone at (613) 243-8955 or by email at eportt@lakeheadu.ca. You can also contact Dr. Amanda Maranzan (supervisor) by telephone at (807) 343-8322 or by email (amaranzan@lakeheadu.ca). This research study has been reviewed and approved by the St. Joseph's Care Group Research Ethics Board and Lakehead University Research Ethics Board. If you think that your rights as a participant have been violated you can contact St. Joseph's Care Group Research Ethics Board for more information: Chair, Research Ethics Board St. Joseph's Care Group 580 N. Algoma St., Thunder Bay, Ontario P7B 5G4 phone: 807-343-4300 ext. 4723 fax: 807-343-4376, email contact for REB Chair: REB_Chair@tbh.net. You may also contact the Lakehead University Research Ethics Board for more information: 807-766-7289.

If you would like a summary of the research results, please indicate so on the small form included in the questionnaire package. A summary will be sent to you at the end of the study (September 2014).

Thank you for considering participating in this study.

Erika Portt, M.A. Student

Amanda Maranzan, Assistant Professor

Lakehead University

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Appendix D

Scripts Read by the Group Leader

Introduction to Study by Group Leader

(To be read by group leader at the start of the first group treatment session).

There is a research project being done by a Master's student at Lakehead University. She is very interested in the treatment of anxiety, and she has asked me to read a paragraph to you about her research. She is inviting group members to participate in her research project or to learn more about the project.

My name is Erika Portt and I am a graduate student in the Clinical Psychology program at Lakehead University. I am currently working on a research project under the supervision of Dr. Amanda Maranzan. We are wanting to find out the effects of this anxiety group. In order to find this out, we are inviting you to complete some questionnaires at the beginning, middle, and end of the group. The questionnaires ask about how you are feeling, for example, your mood and anxiety symptoms, and how you think about anxiety. It takes about 20 minutes to complete the questionnaires. If completing the questionnaires makes you feel worse, please let the group leader know. In order to thank you for your participation, we will be giving each participant who completes the study a $10 gift certificate.

You don't have to participate in this research – if you decide not to, you can still participate in this group and all other treatments here. The group leader will not be able to look at your questionnaires so please let her know if there is something important she should be aware of.

If you would like more information about the study, please contact me. The questionnaire packages also contain an information letter that describes the study in greater detail. We are inviting everyone to take a package with them to learn more about the study. You can read the information letter at home to decide if you would like to participate or not. If you don't want to participate, simply do not fill out the questionnaires and do not mail them in.

A drop off box is provided to place the questionnaire package in if you do not want to participate or to find out more about the study. We are encouraging everyone to take a package so that your choice to participate or not remains private.

(Group leader gives participants a questionnaire package and information letter as clients leave the room)

Script to Notify Clients of Questionnaire Packages at Midtreatment and Posttreatment

(To be read by the group facilitator at the end of the mid-treatment session)

As we mentioned in the first session, there is a Lakehead University who is conducting a study about the treatment of anxiety. Since we are now half-way through the treatment, this is the second time point for

the questionnaire packages to be completed. If you participated at Time 1, and are interested in continuing to participate, please complete a questionnaire package again and mail it to the researchers. If you did not participate at Time 1, or wish to stop participating, then do not complete the questionnaire packages. Your participation is voluntary so you can stop participating at any time.

We are asking everyone to take a package on your way out the door so that we do not know who is participating. However, there is a drop off box to put the questionnaire package in if you are not participating. Please let us know if you have any questions.

(To be read by the group facilitator at the end of the last session)

As we mentioned in the first session and at mid-treatment, there is a Lakehead University who is conducting a study about the treatment of anxiety. Since we are now at the end of the treatment, this is the third time point for the questionnaire packages to be completed. If you participated at both Time 1 and Time 2, and are interested in continuing to participate, please complete a questionnaire package again and mail it to the researchers. If you did not participate at Time 1 and Time 2, or wish to stop participating, then do not complete the questionnaire packages. Your participation is voluntary so you can stop participating at any time.

We are asking everyone to take a package on your way out the door so that we do not know who is participating. However, there is a drop off box to put the questionnaire package in if you are not participating. Please let us know if you have any questions.

Script to Explain Codes during Program Evaluation

(To be read by group leader before program evaluation measures are completed)

As there is a study being conducted by a student at Lakehead University, we are asking you to answer three questions to generate a code. This code is used to match the program evaluation information to the other questionnaire data, for people who are participating in the study. If you are not participating in the study, this code will not be relevant and your information will not be used. By having everyone generate the code right now, it protects your privacy by preventing us from knowing who is participating and who is not. Please let us know if you have any questions or concerns.

Appendix E Demographic Questionnaire

Thank you for participating in this research study.

Your participation is voluntary. You do not have to complete any questions that you feel uncomfortable completing.

The first three questions will help us create a unique code to match your questionnaires without having to ask your name or other identifying information.

1. First letter of mother's maiden name (e.g., if your mother's maiden name is Smith, you would put "S"): _____
2. Street number of the house/apartment you lived in while growing up (e.g., if you grew up at 15 Yonge St, you would put "15"): _____
3. First letter of the street you now live on: (e.g., if you currently live at 29 Barclay Ave, you would put "B") ____
4. Sex: ☐ Male ☐ Female
5. Age: _____(years)
6. Cultural affiliation (rank number all that apply – 1 for primary affiliation, 2 for secondary, etc.)

____ Aboriginal (First Nation, Inuit, Metis)

____ Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese)

____ Black (e.g., African, Haitian, Jamaican)

____ Chinese

____ Filipino

____ Japanese

____ Korean

____ Latin American

____ South Asian

____ South East Asian

____White (Caucasian)

____ Other (please specify: _____)

7. Are you now ☐ Married/common-law ☐ Separated
   ☐ Widowed ☐ Divorced
   ☐ Never married

8. What is the highest level of education you have completed?
   ☐ High school ☐ Some college/university
   ☐ College/university ☐ Post graduate degree

9. What was your total household income from all sources, before taxes, last year?
   ☐ Below $20,000 ☐ $60,001 - $80,000
   ☐ $20,001 - $40,000 ☐ $80,001 - $100,000
   ☐ $40,001 - $60,000 ☐ $100,001 +

10. Employment:
   ☐ Work full-time ☐ Work part-time
   ☐ Retired ☐ Do not work

11. Have you ever been diagnosed with a psychological, emotional, or psychiatric condition?
   ☐ No ☐ Yes

   If "yes", please list: _____

12. Are you starting the anxiety disorder group today?
   ☐ Yes ☐ No – I am on the waiting list for the next group

13. Besides the anxiety disorder group, are you receiving any other types of treatment?
   ☐ No ☐ Yes - medication
   ☐ Yes – individual therapy/counselling
   ☐ Yes –group therapy/counselling

☐ Yes – other type of treatment (specify: _____)

Appendix F

Positive and Negative Affect Schedule (PANAS)

Your participation is voluntary. You do not have to complete any questions that you feel uncomfortable completing.

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you have felt this way during the past few weeks.

1 = Very slightly or not at all
2 = A little
3 = Moderately
4 = Quite a bit
5 = Extremely

		Very slightly	A little	Moderately	Quite a bit	Extremely
1.	Interested	**1**	**2**	**3**	**4**	**5**
2.	Distressed	**1**	**2**	**3**	**4**	**5**
3.	Excited	**1**	**2**	**3**	**4**	**5**
4.	Upset	**1**	**2**	**3**	**4**	**5**
5.	Strong	**1**	**2**	**3**	**4**	**5**
6.	Guilty	**1**	**2**	**3**	**4**	**5**
7.	Scared	**1**	**2**	**3**	**4**	**5**
8.	Hostile	**1**	**2**	**3**	**4**	**5**
9.	Enthusiastic	**1**	**2**	**3**	**4**	**5**
10.	Proud	**1**	**2**	**3**	**4**	**5**
11.	Irritable	**1**	**2**	**3**	**4**	**5**
12.	Alert	**1**	**2**	**3**	**4**	**5**

13.	Ashamed	**1**	**2**	**3**	**4**	**5**
14.	Inspired	**1**	**2**	**3**	**4**	**5**
15.	Nervous	**1**	**2**	**3**	**4**	**5**
16.	Determined	**1**	**2**	**3**	**4**	**5**
17.	Attentive	**1**	**2**	**3**	**4**	**5**
18.	Jittery	**1**	**2**	**3**	**4**	**5**
19.	Active	**1**	**2**	**3**	**4**	**5**
20.	Afraid	**1**	**2**	**3**	**4**	**5**

Appendix G

Intolerance of Uncertainty Scale – Short Form

Your participation is voluntary. You do not have to complete any questions that you feel uncomfortable completing.

Intolerance of Uncertainty Scale - Short Form

(Carleton, Norton, & Asmundson, 2007)

Please circle the number that best corresponds to how much you agree with each item.

	Not at all characteristic of me	A little characteristic of me	Somewhat characteristic of me	Very characteristic of me	Entirely characteristic of me
1. Unforeseen events upset me greatly.	1	2	3	4	5
2. It frustrates me not having all the information I need.	1	2	3	4	5
3. Uncertainty keeps me from living a full life.	1	2	3	4	5
4. One should always look ahead so as to avoid surprises.	1	2	3	4	5
5. A small unforeseen event can spoil everything, even with the best of planning.	1	2	3	4	5
6. When it's time to act, uncertainty paralyses me.	1	2	3	4	5
7. When I am uncertain I can't function very well.	1	2	3	4	5
8. I always want to know what the future has in store for me.	1	2	3	4	5
9. I can't stand being taken by surprise.	1	2	3	4	5
10. The smallest doubt can stop me from acting.	1	2	3	4	5
11. I should be able to organize everything in advance.	1	2	3	4	5
12. I must get away from all uncertain situations.	1	2	3	4	5

Appendix H

Penn State Worry Questionnaire (PSWQ)

Your participation is voluntary. You do not have to complete any questions that you feel uncomfortable completing.

PSWQ

Circle the number that best describes how typical each item is of you over the past few weeks.

1 = Not at all typical of me 2 3 = Somewhat typical of me 4 5 = Very typical of me		Not at all typical		Somewhat typical		Very typical
1.	If I do not have enough time to do everything, I do not worry about it.	**1**	**2**	**3**	**4**	**5**
2.	My worries overwhelm me.	**1**	**2**	**3**	**4**	**5**
3.	I do not tend to worry about things.	**1**	**2**	**3**	**4**	**5**
4.	Many situations make me worry.	**1**	**2**	**3**	**4**	**5**
5.	I know I should not worry about things, but I just cannot help it.	**1**	**2**	**3**	**4**	**5**
6.	When I am under pressure I worry a lot.	**1**	**2**	**3**	**4**	**5**
7.	I am always worrying about something.	**1**	**2**	**3**	**4**	**5**
8.	I find it easy to dismiss worrisome thoughts.	**1**	**2**	**3**	**4**	**5**
9.	As soon as I finish one task, I start to worry about everything else I have to do.	**1**	**2**	**3**	**4**	**5**
10.	I never worry about anything.	**1**	**2**	**3**	**4**	**5**
11.	When there is nothing more I can do about a concern, I do not	**1**	**2**	**3**	**4**	**5**

	worry about it any more.					
12.	I have been a worrier all my life.	**1**	**2**	**3**	**4**	**5**
13.	I notice that I have been worrying about things.	**1**	**2**	**3**	**4**	**5**
14.	Once I start worrying, I cannot stop.	**1**	**2**	**3**	**4**	**5**
15.	I worry all the time.	**1**	**2**	**3**	**4**	**5**
16.	I worry about projects until they are all done.	**1**	**2**	**3**	**4**	**5**

Appendix I

Cognition Checklist

Your participation is voluntary. You do not have to complete any questions that you feel uncomfortable completing.

The Cognition Checklist

Please circle the number that best corresponds to often you have each thought:

	Never	Not very often	Sometimes	Often	All of the time
1. I'm worthless	1	2	3	4	5
2. I will never overcome my problems	1	2	3	4	5
3. Life isn't worth living	1	2	3	4	5
4. There's no one left to help me	1	2	3	4	5
5.Nothing ever works out for me	1	2	3	4	5
6. I have become physically unattractive	1	2	3	4	5
7. I'm not worthy of other people's attention or affection	1	2	3	4	5
8. I don't deserve to be loved	1	2	3	4	5
9. People don't respect me anymore	1	2	3	4	5
10. I've lost the only friends I had	1	2	3	4	5
11. I'm worse off than they are	1	2	3	4	5
12. No one cares whether I live or die	1	2	3	4	5
13. I'll never be as good as other people are	1	2	3	4	5
14. I'm a social failure	1	2	3	4	5
15. I'm going to have an accident	1	2	3	4	5
16. There's something very wrong with me	1	2	3	4	5
17. I am going to have a heart attack	1	2	3	4	5
18. Something awful is going to happen	1	2	3	4	5
19. Something will happen to someone I care about	1	2	3	4	5
20. I'm losing my mind	1	2	3	4	5
21. What if I get sick and become disabled?	1	2	3	4	5
22. I am going to be injured	1	2	3	4	5

23. What if no one reaches me in time to help?	1	2	3	4	5
24. I might be trapped	1	2	3	4	5
25. I am not a healthy person	1	2	3	4	5
26. Something might happen that will ruin my appearance	1	2	3	4	5

Appendix J Homework

Compliance

Your participation is voluntary. You do not have to complete any questions that you feel uncomfortable completing.

Please check the box that best describes you:

☐ I completed the homework every week

☐ I completed the homework for most of the weeks

☐ I completed the homework for some of the weeks

☐ I never completed the homework

Appendix K

Treatment Fidelity Measures

Session #1

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Review of group rules and confidentiality

☐ Introduction to group facilitators

☐ Discussion of "what is anxiety" and recording of symptoms on the handouts

☐ Introduction to the CBT model of anxiety

☐ Psychoeducation on the role of breathing in anxiety

☐ Abdominal breathing practice

☐ Introduction to tracking cards

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #2

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Introduction of group facilitators

☐ Review of group rules and confidentiality

☐ Homework discussion while integrating a review of the breathing technique

☐ Review of anxiety symptoms and how they relate to treatment targets

☐ Discussion about the developmental conceptualizations of anxiety and worksheet completed

☐ Psychoeducation on tension

☐ Progressive muscle relaxation practice

☐ Brief introduction to behaviours that will be focused on in later sessions

☐ Review tracking card

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #3

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Homework reviewed with each person

☐ Introduction to focusing on behaviours

☐ Discussion of advantages/disadvantages of maintaining anxiety and practising strategies

☐ Motivational interviewing techniques used to identify barriers to change

☐ Psychoeducation on role exposure, and exposure handout used

☐ Example of creating an exposure hierarchy

☐ Clients create their own hierarchy using a handout

☐ Situational exposure diary created

☐ Tracking card reviewed

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #4

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Review of the homework

☐ Problem solve regarding exposure hierarchy development

☐ Psychoeducation on beginning exposure tasks

☐ Review of the Situational Exposure Diary

☐ Autogenic relaxation

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #5

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Review of the homework

☐ Psychoeducation on exposure to internal sensations using handout

☐ Exposure to internal sensations practice

☐ Introduction to anxiety-related thoughts

☐ Introduction to unhelpful thinking styles

☐Use of the Unhelpful Thinking Style handout

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #6

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Discuss homework practice

☐ Review of Unhelpful Thinking Styles

☐ Introduction to ways of managing unhelpful thoughts

☐ Psychoeducation of changing and analyzing thoughts

☐Introduction to thought diary

☐Work through thought record examples on the board

☐Practice relaxation strategy

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #7

Date of the session: _____

Please check the boxes if the material was covered in this session:

☐ Review of the homework

☐ Review example of thought diary

☐Psychoeducation on mindfulness approach to managing thoughts and worries

☐Leaves on a stream mindfulness practice

☐Psychoeducation on postponing worry

☐ Homework assignment

Please check the box that best describes the order of therapy components:

☐ The session followed the treatment protocol

☐ The session mostly followed the treatment protocol

☐ The session somewhat followed the treatment protocol

☐ The session rarely followed the treatment protocol

How many clients attended this session? _____

Session #8

Date of the session: _____

Please check the boxes if the material was covered in this session:

- ☐ Review of the homework:
  - ☐ Review of mindfulness
  - ☐ Review of worry scheduling
- ☐ Jeopardy review game
- ☐ Discussion of anxiety symptoms and strategies for each symptom
- ☐ Certificates presented
- ☐ Follow-up appointments booked

Please check the box that best describes the order of therapy components:

- ☐ The session followed the treatment protocol
- ☐ The session mostly followed the treatment protocol
- ☐ The session somewhat followed the treatment protocol
- ☐ The session rarely followed the treatment protocol

How many clients attended this session? _____