EXPLORING THE EFFICACY OF DISTANCE TREATMENT FOR ANXIETY AND
ANXIETY SENSITIVITY

by

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Submitted in partial fulfilment of the requirements
for the degree of Doctor of Philosophy

at

Dalhousie University
Halifax, Nova Scotia
June 2013

DALHOUSIE UNIVERSITY

DEPARTMENT OF PSYCHOLOGY AND NEUROSCIENCE

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DALHOUSIE UNIVERSITY

DATE: June 28, 2013

AUTHOR: Janine Vlaar Olthuis

TITLE: EXPLORING THE EFFICACY OF DISTANCE TREATMENT FOR
               ANXIETY AND ANXIETY SENSITIVITY

DEPARTMENT OR SCHOOL: Department of Psychology and Neuroscience

DEGREE: PhD   CONVOCATION: October   YEAR: 2014

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ABSTRACT

Despite the existence of evidence-based interventions for anxiety disorders, many barriers impede access to effective treatment services (e.g., distance from services, comorbidity). This dissertation aimed to investigate ways to overcome some of these barriers by exploring (1) the efficacy of therapist-supported distance cognitive behavior therapy (CBT) for anxiety disorders in adults, (2) the suitability of anxiety sensitivity (AS; a fear of arousal-related physiological sensations) as a target for transdiagnostic treatment, and (3) the efficacy of a distance CBT intervention for reducing high AS and its associated mental health and substance use symptoms. In Study 1, a systematic review showed that therapist-supported distance CBT was more efficacious than a waiting list and as efficacious as face-to-face CBT in reducing anxiety symptoms, increasing the likelihood of diagnostic remission, and improving quality of life. In Study 2, AS was associated with panic, posttraumatic stress, social phobia, and depressive symptoms. Of its lower order subscales, physical concerns predicted unique variance in panic, cognitive concerns predicted unique variance in depressive symptoms, and social phobia was predicted by social concerns. Together, Studies 1 and 2 suggest that distance CBT for anxiety is efficacious and that AS may be a suitable target for transdiagnostic interventions. As such, Studies 3 and 4 report on a randomized controlled trial investigating the efficacy and transdiagnostic implications of a telephone-delivered CBT intervention for high AS. The treatment significantly reduced AS relative to a waiting list and led to significant reductions in panic, posttraumatic stress, and social phobia symptoms (though not generalized anxiety or depressive symptoms). Treatment-related reductions in AS mediated these anxiety symptom changes. Participants in the treatment, vs. control, group also showed a significantly greater reduction in number of mental health diagnoses and in functional disability. Treatment also significantly reduced coping-with-anxiety drinking motives and physical alcohol-related problems for the treatment but not waiting list group. Reductions in AS mediated changes in coping-with-anxiety motives, while coping-with-anxiety motives mediated changes in physical alcohol-related problems. Taken together, findings from this dissertation provide evidence that distance-based and transdiagnostic AS-focused interventions may be two important and efficacious ways to overcome several barriers to anxiety treatment.

LIST OF ABBREVIATIONS AND SYMBOLS USED

ADIS-IV	Anxiety Disorder Interview Schedule – IV
ADNOS	Anxiety disorder, not otherwise specified
ANOVA	Analysis of variance
APA	American Psychiatric Association
AS	Anxiety sensitivity
ASI	Anxiety Sensitivity Index
ASI-3	Anxiety Sensitivity Index – 3
B	Unstandardized multiple regression coefficient
BAI	Beck Anxiety Inventory
Bib	Bibliotherapy
BT	Behaviour therapy
BZ	Benzodiazepine
CASI	Childhood Anxiety Sensitivity Index
CBT	Cognitive behaviour therapy
CCDAN	Cochrane Collaboration Depression Anxiety and Neurosis Group
CGI-C	Clinical Global Impression Scale – change item
CI	Confidence interval
CO_2	Carbon dioxide
CT	Cognitive therapy
CTR	Clinical trial register
d	Cohen's d; measure of effect size
df	Degrees of freedom
DASS-21	Depression Anxiety Stress Scales – 21 item
DASS-42	Depression Anxiety Stress Scales – 42 item
DMQ	Drinking Motives Questionnaire
DrInC	Drinker's Inventory of Consequences
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition, Text Revision)
ED	Eating disorder
ESEMeD	European Study of the Epidemiology of Mental Disorders
g	Hedges' g; measure of effect size
GAD	Generalized anxiety disorder
GCBT	Group cognitive behaviour therapy
HLM	Hierarchical linear modeling
I^2	Measure of statistical heterogeneity
IBT	Internet-based behaviour therapy
ICBT	Internet-based cognitive behaviour therapy
ICD	International Classification of Diseases
ICTRP	WHO's International Clinical Trials Registry Platform
ITT	Intention-to-treat
JVO	Janine V. Olthuis
KMB	Kristen M. Bailey
LOCF	Last observation carried forward
LSAS	Liebowitz Social Anxiety Scale

LSC-R	Life Stressor Checklist – Revised
M	Mean
MADRS	Montgomery-Asberg Depression Rating Scale
MCW	Margo C. Watt
MD	Mean difference
MDD	Major depressive disorder
MDMQ-R	Modified Drinking Motives Questionnaire – Revised
min	Minutes
MPSS	Modified Posttraumatic Stress Disorder Symptom Scale
N	Total sample size
n	Subsample size
n/a	Not applicable
no.	Number
OCD	Obsessive compulsive disorder
OR	Odds ratio
p	Probability of Type I error
PAQ-IV	Panic Attack Questionnaire – IV
PARQ	Physical Activity Readiness Questionnaire
PD	Panic disorder
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PSWQ	Penn State Worry Questionnaire
PTSD	Posttraumatic stress disorder
QOL	Quality of life
QOLI	Quality of Life Inventory
r	Pearson product-moment correlation
R^2	Measure of strength of association in regression
RCT	Randomized controlled trial
SCID	Structured Clinical Interview for DSM-IV-TR Axis I Disorders
SD	Standard deviation
SDS	Sheehan Disability Scale
SHS	Sherry H. Stewart
SIP-R	Short Inventory of Problems – Recent
SMD	Standardized mean difference
SNRI	Serotonin-norepinephrine re-uptake inhibitor
SP	Social phobia
SPS	Social Phobia Scale
SSRI	Selective serotonin re-uptake inhibitor
sx	Symptoms
t	Computed value of *t* test
TCA	Tricyclic antidepressant
VCBT	Videoconferencing cognitive behaviour therapy
WAI-SR	Working Alliance Inventory – Short Form Revised
WHO	World Health Organization
wks	Weeks
WLC	Waiting list control

YBOCS	Yale-Brown Obsessive Compulsive Scale
α	Alpha; index of internal consistency
β	Beta weight; standardized multiple regression coefficient
€	Euros
χ^2	Computed value of a chi-square test
ΔR^2	Change in value of strength of association in regression

Notation for hierarchical linear modeling equations

β_{00}	Overall averaged intercept
β_{01}	Slope for the main effect of treatment group
β_{10}	Slope for the main effect of time
β_{20}	Slope for the main effect of time^2 (quadratic slope for time)
β_{11}	Cross-level interaction between time and treatment group
β_{21}	Cross-level interaction between time^2 and treatment group
e_{ti}	Random errors of the prediction for the level 1 model
r_{0i}	Error component for the intercept

ACKNOWLEDGEMENTS

I am also thankful to have navigated the ups and downs of this process alongside Susan Battista, Heather Fulton, Laura Goodman, Aislin Mushquash, Brigitte Sabourin, and Magda Wojtowicz. I am lucky to have been able to rely on them for support, encouragement, friendship, fun, and company during millions of 'writing dates'. I would also be remiss not to thank my friends in the Crossfit Kinetics community. They have kept me sane and laughing through this whole process, even without really understanding what I was doing.

Finally, I cannot thank my parents and sisters enough for being the wonderful people that they are. They have been amazing advice-givers, listeners, and problem-solvers, my best cheerleaders, and the ones who always knew when fun distractions were much needed. I could not have done this without their love and incredible belief in me.

CHAPTER 1. INTRODUCTION

The research described in this dissertation is focused on overcoming several of the

obstacles to treatment access and treatment efficacy for anxiety disorders in adults. Four

publication-style manuscripts are included in this dissertation. Together, they present the

results of a systematic review and empirical research examining the efficacy of distance

treatment for anxiety as well as a transdiagnostic approach to intervention that could help

address comorbid symptoms in treatment. Before presenting study findings, this

Introduction outlines some important background information and justification for this

avenue of research.

Anxiety Disorders

Prevalence and Severity

Anxiety disorders are one of the most prevalent mental health problems in the

world. While anxiety is a normal emotional, cognitive, and physical experience, an

anxiety disorder occurs when an individual experiences excessive fear or worry that is

disproportionate to actual threat or danger and causes significant distress and/or

impairment in functioning. Over the past decade, epidemiological studies have suggested

that 4% - 26% of individuals suffer from an anxiety disorder every year. Twelve month

prevalence rates from across the world range from 25.5% in Morocco (Kadri, Agoub, El

Gnaoui, Berrada, & Moussaoui, 2007), 21.6% in France (Mental Health in the General

Population Survey, Leray et al., 2011), 11.1% - 18.1% in the USA (National

Epidemiologic Survey on Alcohol and Related Conditions, Grant et al., 2004; National

Comorbidity Survey Replication, Kessler, Chiu, Demler, & Walters, 2005b), 14.4% in

Australia (National Survey of Mental Health and Wellbeing, Slade, Johnston, Oakley

Browne, Andrews, & Whiteford, 2009), 10.1% in the Netherlands (Netherlands Mental Health Survey and Incidence Study – 2, de Graaf, ten Have, van Gool, & van Dorsselaer, 2012), 8.4% in Europe (European Study of the Epidemiology of Mental Disorders, Alonso & Lépine, 2007), 4.7% in Canada (Canadian Community Health Survey, Meng & D'Arcy, 2012), to 4.1% in Nigeria (Nigerian Survey of Mental Health and Wellbeing, Gureje, Lasebikan, Kola, & Makanjuola, 2006). A systematic review of prevalence studies conducted from 1980 - 2004 found that the pooled one year prevalence rate for anxiety disorders was 10.6% (Somers, Goldner, Waraich, & Hsu, 2006).

The Diagnostic and Statistical Manual – Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000) outlines nine anxiety disorders: panic disorder (PD) with or without agoraphobia, agoraphobia without a history of panic, social phobia (SP), specific phobia, acute stress disorder, posttraumatic stress disorder (PTSD), obsessive compulsive disorder (OCD), generalized anxiety disorder (GAD), and anxiety disorder not otherwise specified (ADNOS). The high prevalence rates of these disorders are troubling, as large-scale studies have shown anxiety to be associated with significant functional impairment and decreased quality of life (Andrews, Henderson, & Hall, 2001; Bijl & Ravelli, 2000) as well as difficulties with employment and finances (Leon, Portera, & Weissman, 1995). For example, a large-scale European epidemiological study showed that individuals with anxiety disorders lost three to four times more work days than individuals without a mental disorder and had mental health quality of life scores approximately one standard deviation lower than those without a disorder (ESEMeD Investigators, 2004a).

Individuals with anxiety disorders often adopt maladaptive coping strategies to reduce anxiety, including avoidance (Badour, Blonigen, Boden, Feldner, & Bonn-Miller, 2012; Katerndahl, 2000) or substance misuse (Buckner, Heimberg, Matthews, & Silgado, 2012; Robinson, Sareen, Cox, & Bolton, 2011; Stewart & Conrod, 2008). Avoidance of situations, be they external events or internal states, which an individual fears might induce or heighten anxiety is a common practice among individuals with anxiety disorders as it provides instant relief of anxiety. Unfortunately, this feeling of relief promotes future avoidance behaviour and results in even greater anxiety the next time a similar situation is faced, making it an unhelpful long-term strategy for coping with anxiety (Watt & Stewart, 2008). Misusing substances to cope with anxiety is a similarly negative coping mechanism. While individuals might use alcohol or drugs to reduce anxiety symptoms or enhance feelings of positive well-being successfully in the short term (Kushner, Krueger, Frye, & Peterson, 2008), research suggests that this pattern of self-medication can create a vicious cycle (Stewart & Conrod, 2008). While substance use might serve to provide anxiety relief in the short-term, the anxiety may worsen in the long-term through physiological (e.g., anxiety-related withdrawal symptoms) or psychological (e.g., worry about substance use and its negative consequences) mechanisms (Stewart & Conrod, 2008). This increased anxiety may promote further substance use to cope and could result in substance dependence. In fact, research suggests that one-third to one-half of individuals with drug and alcohol problems became abusive of and/or dependent on substances due to self-medication of anxiety (Bolton, Cox, Clara, & Sareen, 2006). It is evident that such maladaptive coping strategies serve only to increase individuals' symptoms, distress, and impairment.

Further exacerbating this picture, anxiety disorders tend to have an early age of onset and a chronic course. Epidemiological studies have suggested that the median age of onset for anxiety disorders is less than 20 years old (e.g., 14 years, Bonnewyn, Bruffaerts, Vilagut, Almansa, & Demyttenaere, 2007; 14 years, Bunting, Murphy, O'Neill, & Ferry, 2012; 18.5 years, Williams et al., 2010) and a review of prevalence studies showed the median age of onset of anxiety disorders to be 15 years (Kessler, 2007). Moreover, the Harvard/Brown Anxiety Disorders Research Program, a large-scale, longitudinal, prospective study of adults with anxiety disorders, has found that the majority of anxiety disorders have a chronic course, with high rates of relapse and low rates of spontaneous remission (Bruce et al., 2005; Keller et al., 1994). For instance, they found low probabilities of recovery for individuals with GAD (probability = 0.58), PD with agoraphobia (probability = 0.48), and SP (probability = 0.37) over 12 years (Bruce et al., 2005). Similarly, in his systematic review, Kessler (2007) cited the ratio of six/12 month prevalence rates to lifetime prevalence rates as indicative of the persistence of anxiety disorders; 60-70% of individuals with a lifetime anxiety disorder reported that it was active in the six to 12 months prior to their interview. The early onset and chronic course of anxiety mean that these disorders are often long-standing problems for individuals.

Comorbidity

Anxiety disorders are highly comorbid mental health problems. Research suggests that anxiety disorders are often comorbid with each other (Brown, Campbell, Lehman, Grisham, & Mansell, 2001; Kadri et al., 2007; Kessler, 2007; Kessler et al., 2005b; Lamers et al., 2011; Leray et al., 2011; Meng & D'Arcy, 2012), as well as with mood

disorders (Alonso & Lepine, 2007; Brown et al., 2001; Fava et al., 2000; Kessler et al., 2005b; Lamers et al., 2011; Meng & D'Arcy, 2012; Roy-Byrne et al., 2000) and substance abuse/dependence (Alonso & Lepine, 2007; (Conway, Compton, Stinson, & Grant, 2006; Grant et al., 2004; Kessler et al., 2005b; Stewart & Conrod, 2008; Wolitzky-Taylor, Operskalski, Ries, Craske, & Roy-Byrne, 2011). Comorbidity amongst the anxiety disorders is very prevalent in clinical samples. For instance, one large clinical sample showed rates of comorbidity amongst SP, GAD, and PD to range from 31% to 47% (Lamers et al., 2011). Similarly, Brown and colleagues (2001) found that 27% of those with current specific phobia had a current comorbid anxiety disorder, as did 28% of those with current SP, 39% of those with current OCD, 46% of those with current PD with or without agoraphobia, 52% of those with current GAD, and 62% of those with current PTSD. These two studies are from the Netherlands (Lamers et al., 2011) and the USA (Brown et al., 2001), where the prevalence of anxiety in the general population is 10.1% and 11.1% - 18.1%, respectively. The high rates of comorbidity among the clinical sample illustrate a significantly increased risk for an anxiety disorder among those who already have one as compared to the general population. When considering lifetime diagnoses, Kessler (2007) noted that more than half of individuals with a history of one anxiety disorder also qualify for a second anxiety disorder diagnosis at some point in their life.

Comorbidity between anxiety and depression has also been widely reported, particularly in clinical samples. According to results of the Canadian Community Health Survey, the yearly prevalence of comorbidity among those with a mood or anxiety disorder is 22.4% (Meng & D'Arcy, 2012). Using American epidemiological data, Roy-

Bryne and colleagues (2000) found that approximately 56% of those with lifetime PD also met the lifetime criteria for major depressive disorder (MDD) while 11% of those with lifetime MDD also met lifetime PD criteria. Among a clinical sample, Brown and colleagues (2001) found that 64% of those with current MDD had a current comorbid anxiety disorder, while 3% of those with current specific phobia, 14% with current SP, 22% with current OCD, 23% with current PD with or without agoraphobia, 26% with GAD, and 69% with current PTSD also had current comorbid MDD. Similarly, Lamers et al. (2011) found that 67% of those with current MDD had a current comorbid anxiety disorder and 63% of those with a current anxiety disorder had current comorbid MDD. Epidemiological studies report past year prevalence rates of approximately 5.0% for MDD in the general population (Alonso & Lepine, 2007; Meng & D'Arcy, 2012); in light of the rates of comorbidity between anxiety and depression reported here, it is evident that having an anxiety disorder significantly increases one's risk for MDD.

Significant positive associations also exist between substance use disorders and anxiety disorders (Kessler et al., 2005b; Wolitzky-Taylor et al., 2011). Epidemiological data revealed that 15% of those with an anxiety disorder had a comorbid substance use disorder and almost 18% of those with a substance use disorder had a comorbid anxiety disorder during the same 12 month period (Grant et al., 2004). Again, considering the prevalence for past year substance use disorders in the general population – 3.8% (Kessler et al., 2005b) – there is a significantly heightened risk for substance use among those with anxiety disorders (Alonso & Lepine, 2007; Marmorstein, 2012). In another study, 19% of those with an anxiety disorder reported a lifetime drug use disorder and 30% of those with a drug use disorder reported a lifetime anxiety disorder (Conway et al.,

2006). Anxiety disorders tend to precede substance use problems (Marmorstein, 2012; Robinson, et al., 2011; Smith & Book, 2010; Stewart, Samoluk, & MacDonald, 1999) in those with both disorders, consistent with theories (e.g., tension-reduction, Conger, 1956; self-medication, Khantzian, 1985; stress-dampening, Sher & Levenson, 1982) that substance use might become problematic when it is used as a strategy to deal with anxiety (Wolitzky-Taylor et al., 2011).

Comorbidity is concerning because it can exacerbate mental health symptoms. For instance, research suggests that individuals with at least two comorbid anxiety disorders as compared to a single anxiety disorder demonstrate more severe and chronic symptoms and receive more treatment (Klein Hofmeijer-Sevink et al., 2012). The combination of anxiety and depressive disorders is associated with even more severe symptoms and impaired functioning (Klein Hofmeijer-Sevink et al., 2012). As a whole, comorbidity tends to result in more severe symptoms that are more disabling, more persistent over time (Bijl & Ravelli, 2000; Erwin, Heimberg, Juster, & Mindlin, 2002; Fichter, Quadflieg, Fischer, & Kohlboeck, 2010; Merikangas et al., 2003; Roy-Byrne et al., 2000), and lead to greater use of health care resources (McLaughlin, Khandker, Kruzikas, & Tummala, 2006) and lower quality of life (Lochner et al., 2003), than independent diagnoses.

Treatment of Anxiety Disorders

Cognitive Behavioural Therapy

Given the prevalence of anxiety disorders and the distress and impairment their symptoms can create, identifying evidence-based, effective treatments for anxiety is of utmost importance. Fortunately, anxiety treatment has been a focus of research for some

time and it is now widely recognized that cognitive behavioural therapy (CBT), a type of psychological intervention, is an effective treatment for anxiety disorders (Deacon & Abramowitz, 2004; Hofmann & Smits, 2008; Norton & Price, 2007; Olatunji, Cisler, & Deacon, 2010a; Stewart & Chambless, 2009). Moreover, research suggests that CBT is as effective as pharmacological interventions (e.g., benzodiazepines, selective serotonin reuptake inhibitors) in treating anxiety in its acute phase and may be more effective than these interventions or a combination of both treatments in the long term (Otto, Pollack, & Maki, 2000; Otto, Smits, & Reese, 2005; Pull, 2007; Westra & Stewart, 1998). Also, unlike CBT, some pharmacological treatments have the potential for serious side effects (Buffett-Jerrott & Stewart, 2002; Choy, 2007) and/or addiction (McNaughton, 2008).

In essence, the underlying principles of CBT posit that anxiety symptoms develop due to a specific pattern of dysfunctional cognitions in combination with a set of behaviours that serve to further exacerbate these cognitions (Beck, Rush, Shaw, & Emery, 1979). As such, while the exact mechanisms of action in CBT are not yet well understood (Olatunji & Hollon, 2010), cognitive techniques and behaviour modification strategies are used to identify, evaluate, and challenge underlying maladaptive cognitions and core beliefs (Weishaar & Beck, 1987). According to these principles, CBT protocols have been conceptualized and developed to treat the different anxiety disorders. For example, PD is thought to stem from catastrophic thoughts about the consequences of arousal-related physiological sensations, overestimations of the probability of these consequences, and avoidance of situations that might induce these sensations (Barlow, 1988; Clark, 1986). Following these principles, CBT for PD employs a combination of cognitive restructuring techniques to teach individuals to identify and challenge their

maladaptive cognitions about physiological sensations, and graded, repeated exposure to feared sensations to help individuals revise their perceptions of threat and reduce their fear of these sensations (Landon & Barlow, 2004). Research shows that CBT is an effective treatment for PD (McHugh, Smits, & Otto, 2009).

Specific models of CBT now exist for the other anxiety disorders as well; these models hold true to the underlying cognitive and behavioural principles of CBT, modifying or adapting these principles to fit disorder-specific symptoms (e.g., SP – Clark & Wells, 1995; Heimberg, Brozovich, & Rapee, 2010; specific phobias – Rachman, 1978; Coelho & Purkis, 2009; GAD – Wells, 1995; Behar, DiMarco, Hekler, Mohlman, & Staples, 2009; PTSD – Ehlers & Clark, 2000; OCD – Salkovskis, 1985). A large body of research provides evidence for the efficacy of CBT interventions for anxiety disorders including PD with or without agoraphobia (McHugh et al., 2009; Sanchez-Meca, Rosa-Alcazar, Marin-Martinez, & Gomez-Conesa, 2010), SP (Fedoroff & Taylor, 2001; Heimberg, 2002), specific phobias (Gros & Antony, 2006), GAD (Hunot, Churchill, Teixeira, & Silva de Lima, 2007), PTSD (Bisson & Andrew, 2007), and OCD (Olatunji, Davis, Powers, & Smits, 2013).

Role of Comorbidity in Treatment Outcome

Research is mixed as to the role that comorbidity plays in anxiety treatment outcome (Bauer, Wilansky-Traynor, & Rector, 2012; Olatunji, Cisler, & Tolin, 2010b; Wolitzky-Taylor et al., 2011). In fact, research is so varied that a comprehensive review of the role of comorbid anxiety and depression in the treatment of each unique anxiety disorder is not possible here. However, a look the influence of comorbid emotional disorders in CBT for PD can provide some insight. On the one hand, a number of studies

have found that comorbidity does not have a detrimental effect on the outcome of CBT

for PD (Joorman, Kosfelder, & Schulte, 2005; Kampman, Keijsers, Hoodduin, &

Hendriks, 2008; Rief, Trenkamp, Auer, & Fichter, 2000; Tsao, Mystkowski, Zucker, &

Craske, 2005). For instance, one study showed that while comorbidity was associated

with more severe PD symptoms, comorbid GAD, SP, specific phobia, and MDD were not

associated with a differential PD treatment response (Allen et al., 2010). Similarly,

Craske et al. (2007) found that a 'pure' PD CBT treatment resulted in better PD outcomes

than a PD CBT treatment that strayed from the protocol to address comorbidity. In

contrast, other research has shown that individuals with PD with comorbidities improved

less after CBT and in some cases evidenced more dropout as compared to those without

comorbidity (Chambless, Renneberg, Gracely, Goldstein, & Fydrich, 2000; Steketee,

Chambless, & Tran, 2001; van Balkom et al., 2008).

Research is also somewhat mixed as to the degree of reduction in comorbid

conditions resulting from treating a primary disorder (Bauer et al., 2012). In general,

research suggests that there may be some reduction in comorbidities resulting from

treatment of a primary anxiety disorder but that the majority of patients retain their

comorbid diagnosis post-treatment if not directly addressed (Brown, Antony, & Barlow,

1995; Allen et al., 2010; Tsao et al., 2005). Similarly, even if comorbid diagnoses are no

longer met post-treatment, comorbid anxiety and depressive symptom levels may still be

relatively high (Corominas, Guerrero, & Vallejo, 2002; Joorman et al., 2005). For

instance, a meta-analysis of CBT for anxiety disorders by Hoffman and Smits (2008)

showed that CBT for PD did not decrease comorbid depression symptoms more than a

placebo. Research also suggests comorbid symptoms that are not directly addressed in

treatment might increase or reoccur (Brown et al., 1995; Rief et al., 2000) between the end of treatment and follow-up.

Researchers have also considered the role of comorbid substance use disorders in anxiety treatment outcome. Some researchers have suggested that, together, substance use and anxiety disorders serve to maintain each other over time, as substances are used to treat anxiety symptoms while the physiological effects of substance use withdrawal serve to prompt increased levels of anxiety and necessitate further substance use (Stewart & Conrod, 2008; Wolitzky-Taylor et al., 2011). While research into the effects of anxiety use disorders on substance use treatment suggests comorbid anxiety is associated with poorer substance use treatment outcome and increased relapse rates (Driessen et al., 2001; Kushner et al., 2005; Ouimette, Gima, Moos, & Finney, 1999; Smith & Book, 2010; Wolitzky-Taylor et al., 2011), research into the role of comorbid substance use on anxiety treatment outcomes is somewhat limited (Baillie et al., 2010). A large scale longitudinal study investigating the course of SP, GAD, and PD, found that the presence of a comorbid alcohol or substance use disorder made recovery from GAD five times less likely and recurrence of GAD three times more likely (Bruce et al., 2005). As another example, McEvoy and Shand (2008) investigated whether pre-treatment alcohol consumption levels accounted for variance in anxiety treatment outcome following CBT for either PD or SP. They found no effect for pre-treatment alcohol consumption levels on panic symptoms or SP performance anxiety, but they did find that higher pre-treatment alcohol consumption resulted in less change in social interaction anxiety. While inconclusive, these studies do, however, suggest at least some detrimental role for comorbid substance problems in anxiety treatment outcome.

Rates of Treatment Use

Despite the existence of evidence-based treatments across the anxiety disorders, many individuals do not receive the mental health services they need. In general, underutilization of mental health services is the case for those with most mental health problems, with epidemiological studies suggesting that only 22% to 41% of individuals with a psychiatric diagnosis within the past 12 months received past year mental health services from some type of general medical or mental health professional (Alonso & Lépine, 2007; Slade et al., 2009; Wang et al., 2005). Results of the European Study of the Epidemiology of Mental Disorders found that only one in five individuals meeting criteria for an anxiety disorder (20.6%) had presented to health care services in the past year (Alonso & Lépine, 2007). Similarly, epidemiological studies from Australia (Slade et al., 2009) and the USA (Mackenzie, Reynolds, Cairney, Streiner, & Sareen, 2012) found that only 37.8% and 19.3%, respectively, of individuals meeting criteria for a past year anxiety disorder had received mental health treatment in the past 12 months. In Canada, 36.9% of those with a current anxiety disorder had received some type of mental health services in either the general medical sector (i.e., consulted their physician) or the specialized mental health care sector (i.e., consulted with a psychiatrist or psychologist in any setting or a nurse, social worker, or counsellor in a specialized mental health care setting) in the past year (Roberge, Fournier, Duhous, Nguyen, & Smolders, 2011). Taking into account service utilization rates, prevalence rates, and population size, a review of community-based epidemiological surveys since 1980 suggests that worldwide, the median untreated rate for PD is 55.9%, for GAD is 57.5%, and for OCD is 59.5% (Kohn, Saxena, Levav, & Saraceno, 2004).

To add to this bleak picture, results of the National Comorbidity Survey – Replication suggest that of those with a current DSM-IV-TR diagnosis who had received treatment in the past 12 months, only 32.7% received at least minimally adequate treatment, defined as either at least two months of an appropriate medication in combination with at least four physician visits or at least eight 30-minute visits with any health care or human services professional (Wang et al., 2005). Among individuals with anxiety disorders who received treatment in the past 12 months, rates of those receiving at least minimally adequate treatment ranged from 33.6% for specific phobia to 42.5% for GAD (Wang et al., 2005). Using the same guidelines for minimally adequate treatment, results from Europe suggest that the proportion of treatment adequacy among those with anxiety was 54.5% (Fernandez et al., 2007). These results are also reflected in the Canadian Community Health Survey of Mental Health and Wellbeing. This study found that 20.7% of individuals with anxiety disorders had received minimally adequate treatment (at least four healthcare provider visits and the use of a medication prescribed by a physician or at least seven visits to a specialized mental health care provider for a psychological intervention) in the past 12 months, with this number increasing to 36.8% for those with at least one contact with general medical services and to 55.7% for those with at least one contact in specialized mental health services (Roberge et al., 2011).

Barriers to Treatment

The underutilization of mental health services in the face of high prevalence rates of anxiety and other mental health problems suggests the existence of barriers and obstacles to care. In an effort to improve access to care, researchers have worked to identify these barriers to care to be better able to address them. This work has led to the

recognition of barriers at the individual/client, provider, systemic/administrative, and treatment efficacy levels (Collins, Westra, Dozois, & Burns, 2004; Mechanic, 2007). For the purposes of the present study, we were most interested in barriers at the individual, systemic, and treatment efficacy levels. Barriers at the provider level involve the role of physicians in mental health care and their attitudes/abilities in detecting, assessing, and treating mental health problems in their practice (Collins et al., 2004). While important in their own right, examining and addressing this category of barriers is outside the scope of the current dissertation.

At the individual level, barriers might be practical/structural or emotional/attitudinal (Mohr et al., 2006; Mojtabai et al., 2011). Practical barriers include things like the cost of therapy, time constraints (e.g., work or school commitments making it difficult to find time for therapy during the hours it is offered), difficulties with transportation to therapy (including means of transportation as well as physical/mental health problems that limit travel outside of the home), long waiting lists, and competing responsibilities such as childcare (Alvidrez & Azocar, 1999; Christiana et al., 2000; Craske et al., 2005; Kowalewski, McLennan, & McGrath, 2011; Lingley-Pottie & McGrath, 2007; Mohr et al., 2006; Mojtabai et al., 2011; Prins, Verhaak, Bensing, & van der Meer, 2008; Williams, Domanico, Marques, Leblanc, & Turkheimer, 2012). Emotional barriers include discomfort talking with an unfamiliar person about personal/private issues and worries about stigma and embarrassment (Christiana et al., 2000; Craske et al., 2005; Mohr et al., 2006; Mojtabai et al., 2011; Prins et al., 2008; Williams et al., 2012). Other barriers at the individual level involve perceptions of mental health treatment (e.g., having negative stereotypes of treatment, being unaware of

treatment options or where to go for help; Christiana et al., 2000; Craske et al., 2005) and perceptions of the severity of one's mental health problems (e.g., minimizing the severity of problems, desire to handle problems independently, lack of readiness for change; Christiana et al., 2000; Goodwin; Koenen, Hellman, Guardino, & Struening, 2002; Koenen, Goodwin, Struening, Hellman, & Guardino, 2003; Mojtabai, Olfson, & Mechanic, 2002).

At the systemic level, barriers to care have to do with the availability of evidence-based mental health treatments. One important barrier to care at this level is a lack of specialized mental health providers, particularly in rural areas (Collins et al., 2004; Johnson, Brems, Warner, & Weiss Roberts, 2006; Merwin, Hinton, Dembling, & Stern, 2003). Moreover, even within mental health services, the provision of minimally adequate care is not necessarily guaranteed (Fernandez et al., 2007; Roberge et al., 2011; Wang et al., 2005), nor is the provision of evidence-based treatment (Addis & Krasnow, 2000; Becker, Zayfert, & Anderson, 2004). This is largely due to a combination of inadequate training of mental health professionals and problems with the dissemination of evidence-based treatments (Gunter & Whittal, 2010; Karekla, Lundgren, & Forsyth, 2004). Freiheit and colleagues (2004) found that even amongst service providers who reported using "CBT" to treat anxiety, less than 25% reported using interoceptive exposure to treat PD and only 28% reported using exposure and response prevention to treat OCD, both key components of effective CBT for those disorders.

Finally, even with the existence of evidence-based treatments, there are still barriers to care that exist at the treatment efficacy level. A consideration of the rates of remission and recovery of individuals following CBT for anxiety suggests that there is

still room for improvement in response rates (Collins et al., 2004). For example, one recent study of the efficacy of CBT for anxiety disorders at an outpatient clinic found that 62% of participants were treatment responders (i.e., very much improved or much improved from pre-treatment on the Clinical Global Impressions scale) and 43% met remitter status (i.e., improved global functioning combined with normal or 'borderline' severity on the Clinical Global Impressions scale) at post-treatment (DiMauro, Dominigues, Fernandez, & Tolin, 2013). In another recent study of CBT for GAD, results showed a 70% remission rate post-treatment and a 77% remission rate two years later (Dugas et al., 2010). While these results suggest that many participants improve following CBT, they also suggest that there is still a notable percentage of the population that do not respond to a standard CBT intervention. Varying degrees of treatment success may have something to do with client characteristics that interfere with the success of standard CBT techniques. Some studies show that high rates of comorbidity in community samples, for instance, can complicate treatment effectiveness and may not be adequately addressed by otherwise 'efficacious' treatments (e.g., Chambless et al., 2000).

As one might suppose, research suggests that a number of these barriers to treatment might be particularly relevant to individuals in rural communities. This is not surprising given that rural communities tend to have fewer mental health services and fewer qualified mental health clinicians and tend to be far from urban centres where more services may be provided (Johnson et al., 2006; Merwin et al., 2003). In fact, common barriers endorsed by rural populations include (a) distance from services, which is sometimes compounded by transportation difficulties, (b) a lack of available services and limited number of qualified mental health care providers in close proximity, which can

mean longer times spent on waiting lists, (c) inconvenient hours of service provision, and (d) stigma (Fox, Blank, Rovnyak, & Barnett, 2001; Hauenstein et al., 2007; Reschovsky & Staiti, 2005; Rost, Fortney, Fischer, & Smith, 2002). Perhaps as a result of these barriers, one study suggested that urban residents were 47% more likely to receive any mental health treatment than their rural counterparts, and 72% more likely to receive specialized mental health services (Hauenstein et al., 2007).

Taken together, these individual-, systemic-, and treatment efficacy-level obstacles can discourage individuals from seeking treatment, increase the severity of mental health problems, and create a negative relationship between those looking for care and the service organizations designed to help them (McGrath & Cunningham, 2005). Given the prevalence and need for treatment for anxiety disorders, in combination with the extent and diversity of the barriers to care that individuals might face in obtaining these needed services, mental health professionals at the practice, research, and policy levels need to investigate strategies to increase access to treatment. Strategies to increase access to care must be implemented at each of the individual, systemic, and treatment efficacy levels.

Improving Treatment Access and Efficacy

Researchers have suggested a number of ways to improve access to treatment including, among others, enhancing public awareness of mental health problems and services available, the better integration of mental health services into primary care, more government funding for mental health services, improved training in evidence based treatments, and more research into the active, effective components of mental health treatments (Collins et al., 2004; Gunter & Whittal, 2010). It would be remiss not to note

that in many countries work is being done to pursue these initiatives. In fact, in some

countries these actions have even resulted in national level policies. For instance, the

Australian government enacted the Better Access to Mental Health Care initiative in 2006

(Littlefield & Giese, 2008) and the United Kingdom launched the Improving Access to

Psychological Therapies initiative in 2007 (Clark, 2012). The latter program, for

example, is designed to address barriers to care at the systemic and treatment efficacy

levels by training over 3000 new psychologists over a three year period in the delivery of

evidence-based treatments recommended by the National Institute for Clinical Excellence

(Clark, 2012).

Distance Treatment

Evidently, the type of large scale initiative described above is needed; however,

undertakings of such a magnitude are not easily achieved. Smaller scale initiatives and

strategies must be explored and developed on the road to national level intervention.

Moreover, the idea that all the barriers discussed above could be addressed through the

implementation of one strategy is unrealistic; multiple efforts are needed to target

different obstacles to treatment. In this vein, one method that has increasingly been

explored in psychological research is the use of remote communication technologies to

extend treatment to individuals who might otherwise have challenges accessing it. In

more concrete terms, this would involve using the telephone, postal services, Internet,

videoconferencing, and/or email to create connections between a therapist and client in

lieu of traditional face-to-face treatment sessions.

This type of service delivery might circumvent a number of the practical obstacles

to treatment at the individual level as well as some of the systemic obstacles. Most

obviously, connecting clients to therapists by this means would address individuals'

difficulties with transportation to mental health services over a distance (Andersson,

2010), a barrier that is particularly relevant for those in rural communities or for those

with physical and/or mental health problems that make travel outside the home

challenging. Addressing this barrier might also have a spillover effect in reducing the

constraints of other barriers; for instance, eliminating the distance to travel to receive

services might make individuals more able to fit treatment into their schedule around

other work, school, and family commitments. In addition to addressing these practical

barriers, this approach to treatment allows individuals to engage in treatment from their

home and thus might also address an emotional barrier at the individual level – i.e., fears

about the stigma associated with seeking mental health services. While this type of

treatment does not reduce stigma, by engaging in treatment from home individuals

eliminate some of the risk in being seen at a mental health clinic, thus protecting their

privacy and confidentiality. At a systematic level, using remote communication

technologies to deliver treatment might increase the availability of qualified mental

health professionals to rural communities. Through the use of the telephone or Internet,

members of rural communities could access resources beyond those available in their

immediate vicinity and connect with practitioners who have integrated remote

communication technologies into their practice.

     Treatment that uses remote communication technologies comes in many shapes

and sizes. In this dissertation, I will refer to this collection of treatments as 'distance' or

'distance-based' treatment. One method is to use the telephone to deliver the entire

treatment. For instance, Lovell and colleagues (2006) delivered a 10 session exposure and

response prevention intervention for OCD by way of weekly 30-minute telephone sessions between the client and therapist. The telephone-based intervention was designed to cover the same content as a comparable face-to-face treatment. Another method involves using videoconferencing to connect the client and therapist. Therapy via videoconferencing mimics face-to-face therapy as the client and therapist can still see each other but are simply in different locations. Frueh and colleagues (2007b) have used this approach to deliver group CBT to veterans with PTSD, for example.

The most popular method of distance treatment seems to be Internet-based interventions (for an example of the development of an Internet-based intervention, see Andersson et al., 2008). Typically in this type of treatment, individuals follow a CBT protocol on an online website which is supplemented with therapist support delivered via email and/or by telephone. As an example, Carlbring and colleagues (2006) developed an Internet-based intervention for individuals with PD in which participants followed 10 treatment modules online, communicated with their therapist by email around homework completion, and engaged in weekly brief telephone calls with their therapist designed to give the clients positive feedback and answers to their questions about treatment. The examples cited here are just several of a growing body of research into the use of remote communication technologies in mental health intervention in general, and anxiety disorder intervention in particular.

Efficacy of distance treatment. In the past decade, research into the efficacy of treatment delivered via remote communication technologies has increased. Only 15 years have passed since Newman, Consoli, and Taylor (1997) published the first review of computer use in the assessment and treatment of anxiety disorders. At that point,

computer-based treatment was focused predominately on the use of the computer to launch software programs to provide treatment that clients could pursue independently, or to serve as an adjunct to treatment (e.g., for exposure activities). With the growing popularity of the Internet, computer-supported interventions now also include web-based interventions, online counseling/therapy, therapeutic software that is operated via the Internet, and the use of the Internet as a supplement to traditional face-to-face therapy (Barak, Klein, & Proudfoot, 2009). Now, an important role for computers and the Internet is to connect clients and therapists.

In reviewing the literature in the field, many authors have considered the overall efficacy of 'computer assisted' or 'computerized' therapy, which encompasses a broad range of both Internet- and computer-based treatments. Cuijpers et al. (2009) conducted a meta-analysis of randomized controlled trials (RCTs) of computer-aided psychotherapy for anxiety disorders. The overall effect size of computer-aided psychotherapy vs. no treatment was $d = 1.08$ in favour of computer-aided psychotherapy, and vs. face-to-face therapy was $d = -0.06$. The latter finding suggests that computer-aided psychotherapy may be as efficacious as traditional face-to-face psychological interventions in treating anxiety. With respect to CBT in particular (for a comprehensive review of computerized CBT for anxiety, see Titov, 2007), meta-analyses have found computerized CBT to be significantly more efficacious than a waiting list control in treating anxiety (g's $= 0.83 -$ 1.12, Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; $d = 0.77$, Reger & Gahm, 2009). Reger and Gahm (2009) also found that computerized CBT was as efficacious as face-to-face CBT in treating anxiety ($d = 0.00$). Other meta-analyses comparing the efficacy of computerized and face-to-face CBT for anxiety and depression generally

support the comparable efficacy of these two treatments. However, given the limited studies available, evidence is not conclusive (Andrews et al., 2010; Kaltenthaler, Parry, & Beverley, 2004).

While the above findings suggest promise for the use of computers in anxiety treatment, for the present purposes we are particularly interested in the use of the Internet to deliver therapy to clients in their homes rather than the clinic. A comprehensive meta-analysis of all types of Internet-based psychotherapy interventions with varying degrees of therapist involvement for any type of mental health problem yielded a medium effect size of $g = 0.53$ (Barak, Hen, Boniel-Nissim, & Shapira, 2008). While this review suggests promise for Internet-based interventions, its large scope is not conducive to a specific understanding of the efficacy of Internet-based CBT for anxiety. In this vein, Spek and colleagues (2007) conducted a meta-analysis of Internet-based CBT for symptoms of anxiety and depression. They found a large effect size, $d = 0.96$, for anxiety symptom outcomes suggesting that Internet-based CBT was significantly more efficacious than a control condition in treating anxiety. Despite this promising finding, some concern has been raised about the low methodological quality of Internet-based CBT studies, with particular concern raised about limitations in participant compliance with the interventions, evaluation of treatment credibility, and monitoring and reporting of participants' engagement in co-interventions (Postel, de Haan, & De Jong, 2008). Moreover, a meta-analysis comparing Internet-based and face-to-face CBT (independent of computerized CBT) in treating anxiety has not yet been conducted.

Beyond Internet-based CBT, however, research into the efficacy of distance-based CBT more broadly (i.e., CBT mediated by any one of the telephone, Internet,

videoconferencing, etc.) to treat anxiety disorders has not been as thoroughly reviewed. Only Bee and colleagues (2008) reviewed the efficacy of remote communication technology-mediated psychotherapy for anxiety. Their review identified only three relevant RCTs, with findings showing a large effect size, $d = 1.15$, in favour of distance-based interventions as compared to non-active control conditions. A limited number of studies prevented them from drawing any conclusions about the efficacy of these interventions compared to face-to-face treatment. Moreover, their review only included studies published before July 2006; there has been a rapid rise in research in the field since then. More recently, Cuijpers and colleagues (2010) reviewed the efficacy of face-to-face psychotherapy vs. guided self-help, including interventions relying on the Internet and/or telephone to connect clients and therapists, in treating anxiety and depression. They found no difference in the efficacy of the two interventions in treating anxiety and depression, $d = -0.02$. However, given the scope of their review, distance-based treatments that included more therapist contact were not included. Thus, while a number of authors have reviewed the efficacy of a number of sub-categories of distance-based treatment (e.g., considering computer-based interventions, Internet-based interventions, and guided self-help) these reviews have largely been either too broad or narrow in scope and have not often focused exclusively on anxiety and CBT, preventing any conclusions from being drawn about the efficacy of distance-based CBT for anxiety. An up-to-date review of the efficacy of distance-based CBT for anxiety is needed.

Role of the therapist. As distance treatment moves forward, one important issue to consider is the role of the therapist in this type of treatment. Evidently, distance therapies that rely on the telephone or videoconferencing to connect clients and therapists

include an important therapist role; essentially, the therapist is delivering CBT as usual, simply via a different modality (e.g., Frueh et al., 2007b; Lovell et al., 2006). Internet-based treatments, however, can involve minimal (e.g., Carlbring et al., 2006) or no therapist contact (for a review of the efficacy of self-help interventions for anxiety, including Internet-based treatments, see Haug, Nordgreen, Ost, & Havik, 2012).

Research is mixed on the importance of the role of the therapist in distance-based interventions. On the one hand, research has shown a positive correlation ($r = 0.75$) between the amount of therapist contact and between-group effect size in studies of Internet-based treatments for anxiety and depression (Palmqvist, Carlbring, & Anderssson, 2007). Similarly, Spek and colleagues (2007) found that Internet-based interventions for anxiety or depressive symptoms without therapist support as compared to a control condition had a small effect size of $d = 0.24$, while Internet-based interventions for anxiety or depressive symptoms with therapist support vs. a control had a large effect size of $d = 1.00$. In addition, studies of Internet-based interventions for depression have shown that minimal therapist contact can lead to increased dropout and reduce treatment effects (e.g., Christensen, Griffiths, Mackinnon, & Brittliffe, 2006).

On the other hand, several studies comparing the use of a therapist and a technician to guide participants through Internet-based treatments for anxiety and depression have found that support from a technician (untrained in mental health treatment but supervised by a clinician) who offered administrative assistance, information about the treatment program and its steps, and encouragement and support, but not clinical advice, can result in equivalent treatment outcomes to support from a psychologist (Robinson et al., 2010; Titov et al., 2010a). These mixed findings suggest

that there might be differences in the efficacy of distance treatment that are contingent on the degree of therapist involvement, and support the separate examination of the efficacy of distance treatment with and without therapist support.

Transdiagnostic Treatment

Evidently, while using remote communication technologies to deliver treatment has promising implications for reducing a number of barriers to treatment access, particularly those at the individual and systemic levels, there are many other obstacles to treatment that remain to be addressed. As mentioned previously, some of these barriers exist at the treatment efficacy level; evidence-based interventions do not appear to be efficacious for all of the people, all of the time (Collins et al., 2004). There are a number of client characteristics that might complicate otherwise efficacious treatments and interfere with individuals' ability to access treatment that works for them. An important one of these characteristics is diagnostic comorbidity.

Researchers have suggested that high rates of comorbidity and the clinical implications of comorbid symptoms on treatment outcome create the need for integrated treatment for each of the concomitant disorders (ESEMeD/MHEDEA Investigators, 2004b). The traditional approaches to treating comorbidities have been to ignore the comorbid condition, treat the comorbidities consecutively, or treat them concurrently but with parallel, non-integrated treatment protocols (Back & Brady, 2008; Kranzler & Rosenthal, 2003; Oei & Loveday, 1997). As suggested earlier, ignoring comorbidities could have varying degrees of impact on treatment outcome (Bauer et al., 2012; Olatunji et al., 2010b; Wolitzky-Taylor et al., 2011). Alternatively, treating comorbid disorders consecutively may also be problematic, as the functional relationship between the

disorders may complicate the treatment approach when the disorders are not addressed simultaneously. For instance, the nature of the link between anxiety and substance misuse, wherein substances are used to self-medicate anxiety symptoms while at the same time they are enhancing anxiety symptoms, serves to maintain each problem in a mutual maintenance fashion (Stewart & Conrod, 2008). There are no published trials of evidence-based treatments tested in a consecutive manner, possibly due to the high demand on health resources of such an option (McManus, Shafran, & Cooper, 2010). That leaves the option of treating comorbidities concurrently with parallel treatment approaches, which also leads to problems including placing too many demands on patients (Conrod & Stewart, 2005), difficulties prioritizing and coordinating treatment components (Back, Waldrop, & Brady, 2009), and higher rates of attrition (Randall, Thomas, & Thevos, 2001). Indeed, Craske et al. (2007) found that treatment focused on one anxiety disorder resulted in better treatment outcome than an intervention designed to treat comorbid symptoms concurrently.

Recently, researchers have investigated a more targeted approach to treating comorbid symptoms. Rather than focus on treating comorbid symptoms disjointedly, these interventions target shared underlying risk factors and common core processes that may contribute to the comorbid conditions independently or to their functional relationship (Barlow, Allen, & Choate, 2004; Craske, 2012). Theoretically, such an approach is warranted in the face of accruing evidence for shared cognitive, behavioural, emotional, and neural dysfunction across anxiety and its related disorders (e.g., neuroticism; dysfunctional emotional processing; maladaptive cognitions including attention, interpretation, and expectancy biases; amygdalar hyperactivity; Craske, 2012;

McManus et al., 2010). The theory behind this approach is that by treating these underlying contributing factors and processes, transdiagnostic symptom improvement might result, improving therapeutic outcome (Barlow et al., 2004). This type of 'transdiagnostic' treatment presents an efficacious and parsimonious approach to treating co-occurring disorders (McManus, et al., 2010).

A number of transdiagnostic treatments have been investigated and shown promise in reducing comorbid mental health symptoms (McEvoy & Nathan, 2007; Norton & Barrera, 2012), generally supporting the hypothesis that transdiagnostic treatment can provide evidence-based care while pragmatically easing dissemination and access to treatment. Perhaps the best known example of an existing transdiagnostic intervention is Barlow and colleagues' Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (2011). This intervention closely follows the theoretical treatment principles described above. The goal is to target common clinical features and core processes of anxiety and depression, neuroticism in particular, by adjusting maladaptive cognitive appraisals, identifying and modifying behavior driven by emotional dysregulation, and preventing emotional avoidance through the provision of alternative coping skills (Barlow et al., 2004; Wilamowska et al., 2010). Preliminary studies with this intervention have shown success in reducing anxiety and depressive symptoms across diagnostic categories (Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010; Farchione et al., 2012).

While Barlow and colleagues have not yet considered the implications for substance use outcomes in their intervention, other studies have suggested that targeting underlying factors might also reduce substance use problems. For example, Conrod et al.

(2000; 2006; 2011) developed interventions aimed at treating problematic personality risk factors (negative thinking, sensation seeking, anxiety sensitivity, or impulsivity) that contribute to substance use problems, with success in reducing the frequency and severity of substance use as well as substance use problems. Results (Castellanos & Conrod, 2006) also showed these interventions to have a moderate effect on treating mental health symptoms as well, including depression (negative thinking targeted treatment) and panic attacks (anxiety sensitivity targeted treatment). Taken together, this research evidence suggests that a transdiagnostic approach to treatment might be one way to improve treatment efficacy and address barriers to treatment access at the treatment efficacy level.

Aims of the Present Dissertation

Given the prevalence of anxiety disorders, their high rates of comorbidity, and the promise of both distance-based service delivery and transdiagnostic interventions, the aim of the present dissertation was to build on existing research by further exploring avenues to facilitate access to anxiety disorders treatment. In addition to its clinical implications, results of this research can inform policy makers as to useful and efficient ways to allocate resources in their efforts to make mental health care more available. Overall, my research pursuit was targeted at addressing treatment barriers at the individual level (practical barriers), systemic level, and treatment efficacy level.

Evidently, as discussed above, there are a number of treatment barriers imposed by the need to travel to mental health services, particularly for those in rural communities. As such, my first research question was, is distance-based CBT (i.e., CBT delivered using remote communication technologies) with some therapist involvement efficacious in treating anxiety disorders in adults? While there have been a number of

different reviews of types of distance-based treatment, these reviews have largely been either too broad or narrow in scope to allow for conclusions about the efficacy of distance-based CBT for anxiety in particular (e.g., of computer-based interventions for anxiety and depression, Andrews et al., 2010; of all Internet-based interventions for any mental health problem, Barak et al., 2008; of guided self-help for anxiety and depression; Cuijpers et al., 2010), or are somewhat out of date (Bee et al., 2008). An up-to-date review of the evidence was needed. To answer this first research question, I conducted a comprehensive Cochrane Systematic Review, including a quantitative meta-analysis of treatment outcomes, of the efficacy of distance-based CBT with therapist involvement for anxiety disorders in adults. If findings showed that distance-based treatment is efficacious, this would help researchers, practitioners, and policy-makers move forward in developing plans to help target those individual- and systemic-level treatment access barriers that distance creates. This Cochrane Review is the first manuscript (Study 1) in my dissertation.

In order to address barriers to treatment at the treatment efficacy level, my second research aim was to develop a new transdiagnostic treatment for anxiety disorders. In this pursuit, my first research question was is anxiety sensitivity an appropriate target for a transdiagnostic intervention? Anxiety sensitivity (AS) is an enduring fear of arousal-related physiological sensations (e.g., increased heart rate, blushing, dizziness, impairments in concentration, etc.) that arises from the tendency to interpret these sensations catastrophically, believing that they will have catastrophic physical, psychological, or social consequences (Reiss, 1991; Reiss & McNally, 1985). AS is conceptualized as an individual difference variable – i.e., that it exists in varying levels

across individuals. An individual high in AS who experiences a racing heart might fear this sensation out of worry that it is a sign of an impending heart attack. On the other hand, an individual low in AS who experiences this same racing heart sensation may view the feeling as unpleasant but a normal, harmless, and transient physiological response. A growing body of research has implicated AS a risk factor in the development and maintenance of anxiety disorders and depression (Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009), as well as substance use problems (Buckner, Proctor, Reynolds, Kopetz, & Lejuez, 2011; Schmidt, Buckner, & Keough, 2007a).

The association of AS with anxiety and its comorbidities suggests that AS may play a similar role in treatment as other underlying risk factors and common core processes that are targeted by Barlow et al.'s (2011) Unified Protocol. Further support for this hypothesis comes from evidence that AS is a mediator of anxiety, depression, and substance use treatment outcomes (Arch, Wolitzky-Taylor, Eifert, & Craske, 2012; Assayag, Bernstein, Zvolensky, Steeves, & Stewart, 2012; Otto, Pollack, Fava, Ucello, & Rosenbaum, 1995; Park et al., 2012; Smits, Powers, Cho, & Telch, 2004), including outcomes of Barlow and colleagues' Unified Protocol (Sauer-Zavala et al., 2012). Moreover, CBT interventions directly targeting AS, often with a focus on interoceptive exposure, have been shown to be efficacious in reducing AS levels in those with high AS (Keough & Schmidt, 2012; Watt, Stewart, Birch, & Bernier, 2006a; Watt, Stewart, Lefaivre, & Uman, 2006b).

To further investigate the appropriateness of AS as a target of transdiagnostic treatment, I examined the relations between AS and anxiety and depressive symptoms among a treatment-seeking community sample in Study 2. Despite the existing body of

research already documenting these associations, further study is needed using a psychometrically sound measure of AS, as the traditional measure of AS, the 16-item Anxiety Sensitivity Index (Peterson & Reiss, 1992), does not adequately assess each of the lower-order factors of AS (i.e., physical, cognitive, and social concerns). With this in mind, the second manuscript in my dissertation uses the 18-item Anxiety Sensitivity Index – 3 (Taylor et al., 2007) to examine the relations of AS with anxiety and depressive symptoms and to investigate whether the lower-order subscales of AS predict unique variance in these mental health symptoms. Study 2 also reviews the existing research documenting the distinct relations of the AS subscales to anxiety and depression.

Finally, my third research aim was to amalgamate my findings with respect to the efficacy of distance-based treatment for anxiety and the promise of AS as a target of transdiagnostic treatment in order to develop a treatment that would address individual, systemic, and treatment efficacy level barriers to care. Thus, my third research question was, is a telephone-delivered CBT intervention for AS efficacious in reducing AS and its associated mental health symptoms? To test this research question, I developed an eight session CBT intervention for high AS based on Watt and Stewart's (2008) self-help book, *Overcoming the Fear of Fear: How to Reduce Anxiety Sensitivity*. I then designed an RCT to test the efficacy of this intervention on reducing high AS and its associated anxiety, depression, and substance use symptoms. The third manuscript in my dissertation (Study 3) reports the AS, anxiety, and depressive symptom outcomes of the RCT, while the fourth manuscript (Study 4) reports the substance use related outcomes.

Taken together, these four manuscripts describe an investigation into ways to overcome barriers to treatment access for individuals in need of treatment for anxiety

disorders. The discrepancy between treatment access and the high prevalence of anxiety disorders worldwide makes this investigation warranted and pressing. Results of these studies may have important clinical and policy implications for the treatment of anxiety disorders and alleviation of the suffering these disorders can cause.

CHAPTER 2. THERAPIST-SUPPORTED DISTANCE COGNITIVE BEHAVIOURAL
THERAPY FOR ANXIETY DISORDERS IN ADULTS[1]

Abstract

Background: Cognitive behavioural therapy (CBT) is an evidence-based treatment for

anxiety disorders; however, many people have difficulty accessing treatment due to a

variety of obstacles. As such, researchers have explored the possibility of using

technology, such as the telephone or Internet, to deliver CBT. As interest in this type of

treatment increases, it is important to ensure that the decision to promote such treatment

is grounded in high quality evidence. **Objectives**: This review examined the efficacy of

therapist-supported distance CBT for the treatment of anxiety disorders in adults. **Search**

Methods: We searched the Cochrane Depression, Anxiety and Neurosis Group clinical

registers (including randomized controlled trials from EMBASE, MEDLINE, and

PsycINFO) up to October 2012 to identify relevant studies. We also searched online

clinical trial registries and the reference lists of included studies. We contacted authors in

the field to locate further relevant trials. **Selection Criteria**: Each identified study was

assessed for inclusion independently by two authors. To be included, studies had to be

randomized controlled trials of therapist-supported distance CBT compared to any of the

following treatments: waiting list, treatment as usual, non-therapist-supported distance

CBT, therapist-supported or non-therapist-supported distance interventions that were not

CBT, or face-to-face CBT. We included studies that treated adults with an anxiety

disorder defined according to the Diagnostic and Statistical Manual of Mental Disorders

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[1] The protocol for this review is outlined in 'Olthuis, J. V., Watt, M. C., & Stewart, S. H. (2011). Therapist-delivered distance cognitive behavioural therapy for anxiety disorders in adults [Protocol]. *Cochrane Database of Systematic Reviews, 3,* CD009028.' This manuscript is currently under review. As first author of this article, I formulated the review protocol, conducted the literature search, study selection, data extraction, and data analysis, and wrote most of the manuscript with suggestions from my coauthors (K. M. Bailey and J. A. Hayden were also involved in this project), peer reviewers, and Cochrane editors.

or the International Classification of Diseases. **Data Collection and Analysis**: Two

authors independently assessed the risk of bias of the included studies and judged the

overall study quality. We used data from intention-to-treat (ITT) analyses wherever

possible. We assessed the treatment effect for the dichotomous outcome of remission of

anxiety disorder diagnosis using an odds ratio (OR) with 95% confidence interval. For

disorder-specific and general anxiety symptom measures as well as quality of life we

assessed continuous scores using the standardised mean difference (SMD) method. We

examined statistical heterogeneity using the I^2 statistic. **Results**: We screened 1468

citations and selected 38 studies (2346 participants) for inclusion in our review. The

studies were comparable, however, they examined a range of anxiety disorders and

various methods and amounts of therapist-delivered distance treatment. Two primary

comparisons of interest were identified - experimental versus waiting list control and

experimental versus face-to-face CBT. Eleven studies (731 participants) contributed to a

pooled OR of 10.07 (95% CI 6.51 to 15.57) for diagnostic remission, favouring therapist-

supported distance CBT over a waiting list control. Similarly, the SMD for disorder-

specific (24 studies, 1477 participants; SMD = -1.26, 95% CI -1.52 to -1.01) and general

anxiety (14 studies, 938 participants; SMD = -0.81, 95% CI -1.12 to -0.49) symptoms

favoured therapist-supported distance CBT over waiting list control. When compared to

face-to-face CBT, therapist-supported distance CBT showed no significant differences in

outcome for diagnostic remission (four studies, 365 participants; OR = 1.25, 95% CI 0.79

to 1.98), disorder-specific anxiety symptoms (nine studies, 530 participants; SMD = 0.17,

95% CI -0.12 to 0.45), or general anxiety symptoms (six studies, 334 participants; SMD

= 0.12, 95% CI -0.35 to 0.59). Overall, the risk of bias in the included studies is low. No

adverse events were identified in the included studies. **Authors' Conclusions**: Therapist-supported distance CBT appears to be an efficacious treatment for anxiety disorders in adults. Overall, the evidence included in this review is of moderate quality. The present findings suggest therapist-supported distance CBT is more efficacious than a waiting list control and as efficacious as face-to-face CBT in reducing anxiety symptoms and leading to diagnostic remission.

Introduction

Plain Language Summary

Anxiety disorders are a worldwide mental health concern. Researchers have developed a type of therapy, called cognitive behaviour therapy (CBT), that works to treat anxiety, however, many people face obstacles in accessing this treatment. For example, some people live in rural areas where there are very few mental health professionals. As a result, researchers have investigated new ways of delivering treatment, such as using the telephone or Internet. While there is a lot of interest in this type of distance CBT, we need to be sure the decision to use this treatment is based on high quality evidence. With this in mind, we investigated whether distance CBT works to treat anxiety disorders in adults. Our search found 38 studies, including 2346 people, that compared distance CBT supported by a therapist with other types of treatment or with no treatment. These studies explored many different types of distance CBT, including CBT delivered by telephone, the Internet, and videoconferencing. The most common was Internet-based CBT with therapist support by email and/or telephone.

Results of our review suggest that distance CBT works better than no treatment in treating anxiety. Participants were much more likely to be free from their anxiety disorder

diagnosis after distance CBT compared with no treatment. They also had greater reductions in their anxiety symptoms, and greater improvement in their quality of life. We also found that therapist-supported distance CBT was as good as traditional face-to-face CBT in treating anxiety. Participants receiving therapist-supported distance CBT had a similar likelihood of being free from their anxiety disorder diagnosis after treatment as did participants receiving face-to-face CBT, and showed similar reductions in anxiety symptoms. None of the included studies reported negative effects of treatment.

The results of this review are limited in that they apply only to (a) treatments that include therapist involvement and (b) individuals with diagnosed anxiety disorders. Despite these limitations, the findings from the current review suggest that therapist-supported distance CBT is a useful treatment for anxiety disorders in adults. This is particularly true of Internet-based CBT with email and/or telephone support from a therapist. There was a limited number of studies of telephone- or videoconferencing-based CBT, thus more research is needed in these areas.

Description of the Condition

Individuals with anxiety disorders experience excessive anxiety (fear or worry) which is disproportionate to actual threat or danger and significantly interferes with normal daily functioning. Anxiety disorders can include a range of symptoms: physical (e.g., trembling, tense muscles, rapid breathing), cognitive (e.g., worries, difficulty concentrating), emotional (e.g., distress, negative affect, irritability), and behavioural (e.g., difficulty sleeping, hyperarousal). Often those with anxiety disorders develop maladaptive strategies to lessen anxiety, such as avoidance (Health Canada, 2002; Wilson & Hayward, 2006) or substance use (Stewart & Conrod, 2008). Studies from Canada

(Statistics Canada, 2004), the USA (Kessler, Chiu, Demler, & Walters, 2005b), Australia (Slade, Johnston, Oakley Brown, Andrews, & Whiteford, 2007), Nigeria (Gureje, Lasebikan, Kola, & Makanjuola, 2006) and Europe (ESEMeD/MHEDEA 2000 Investigators, 2004b) suggest that 5% to 18% of adults experience an anxiety disorder every year. Moreover, rates of remission within one year are low (i.e., from 33% to 42% across specific anxiety disorders; Robins, Locke, & Regier, 1991).

There are many types of anxiety disorders, including panic disorder (PD), agoraphobia, social phobia (SP), post-traumatic stress disorder (PTSD), acute stress disorder, generalized anxiety disorder (GAD), obsessive compulsive disorder (OCD), and specific phobia. These are diagnosed according to criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000) or the International Classification of Diseases (ICD-10; WHO, 1999). Anxiety disorders often co-occur with each other (Kessler et al., 2005b), as well as with mood disorders (Fava et al., 2000) and substance abuse/dependence (Stewart & Conrod, 2008). They tend to have an early onset (Kessler et al., 2005a) and chronic course (Bruce et al., 2005).

Anxiety disorders also have a major economic impact; for instance, costs of direct treatment, unnecessary medical treatment, and work absences/lost productivity amount to more than $40 billion per year in the United States (DuPont et al., 1996; Greenberg et al., 1999). Studies have shown significantly higher annual per capita medical costs for: primary care patients with SP than for those with no mental health diagnosis (€11,952 and €2,957 respectively; Acarturk et al., 2009); primary care patients with panic disorder versus those with a chronic somatic condition (€10,269 versus €3,019; Batelaan et al., 2007); and primary care patients with GAD as compared to those without GAD

($2,375USD versus $1,448USD; Revicki et al., 2012). Upon diagnosis of an anxiety disorder, individuals are, or should be, able to access treatment through public or private health care systems.

Description of the Intervention

Accumulating research supports the efficacy of CBT in the treatment of anxiety disorders (Bisson & Andrew, 2007; Hunot, Churchill, Teixeira, & Silva de Lima, 2007; Norton & Price, 2007; Stewart & Chambless, 2009) and anxiety symptoms (Deacon & Abramowitz, 2004). As its name suggests, CBT includes both cognitive as well as behavioural interventions/techniques. It has no one 'founder' and now exists in many different forms. Its roots, however, lie largely in the work of Aaron Beck (Beck, Rush, Shaw, & Emery, 1979). Whereas pharmacotherapy (most commonly, benzodiazepines or selective serotonin reuptake inhibitors) has been shown to be effective in the treatment of anxiety disorders, meta-analyses and review articles suggest that CBT is as effective in the acute phase of anxiety and may be more effective than pharmacotherapy or a combination of both treatments in the long term (Otto, Pollack, & Maki, 2000; Otto, Smits, & Reese, 2005; Pull, 2007; Westra & Stewart, 1998). Moreover, some anxiety medications pose significant risk for addiction (McNaughton, 2008) and/or serious side effects (Buffett-Jerrott & Stewart, 2002; Choy, 2007).

Unfortunately, certain barriers (e.g., time constraints, transportation problems, stigma, long waiting lists, a lack of sufficiently qualified clinicians) continue to limit access to CBT (Alvidrez & Azocar, 1999; Mohr et al., 2006; Young, Klap, Sherbourne, & Wells, 2001). Many of these barriers are particularly relevant for those living in rural communities (Hauenstein et al., 2006; Rost, Fortney, Fischer, & Smith, 2002; Yuen,

Gerdes, & Gonzalez, 1996). National surveys in Canada (Statistics Canada, 2004) and the US (Kessler et al., 1994) suggest that less than one third (only 32% and 20%, respectively) of those with a current psychiatric disorder received some form of treatment in the past year. In a Canadian sample, only 11% of individuals with an anxiety disorder had received treatment (Ohayon, Shapiro, & Kennedy, 2000).

Increasingly, efforts are being made to improve access to CBT on a large-scale (for example, the UK-based National Health Service 'Improving Access to Psychological Therapies' programme launched in 2006; UK Department of Health, 2008). A distance delivery approach wherein CBT is delivered by a therapist over the telephone or the Internet is one way to minimize treatment barriers and increase access to care while still delivering empirically-supported treatment. Such an approach could increase access to mental health professionals for those in rural areas, facilitate treatment for those of limited mobility, and increase patient confidentiality (i.e., by engaging in treatment from home, clients do not 'risk' being seen at mental health clinics) and privacy (e.g., some types of distance treatment involve a degree of visual anonymity). The widespread availability of communication technologies makes these types of interventions feasible and worth consideration. Recent systematic reviews of telephone-, computer-, and Internet-based treatment for mental health problems largely suggest that these types of distance treatment are more effective than a waiting list control and equally effective as face-to-face psychotherapy in treating anxiety and depression symptoms (Bee et al., 2008; Cuijpers et al., 2009; Cuijpers, Donker, van Straten, Li, & Andersson, 2010; Reger & Gahm, 2009; Spek et al., 2007).

How the Intervention Might Work

Therapist-supported distance CBT should work to treat anxiety in the same manner as conventional face-to-face CBT. The underlying principles of CBT posit that psychopathology, or emotional disturbances, are the result of cognitive distortions and maladaptive behaviour. Whereas there are hypotheses about the relative importance of cognitive and behavioural techniques, as well as suggestions that the strong collaborative working relationship between the therapist and client are key to the success of CBT, the exact mechanisms of action in CBT are not yet well understood (Olatunji & Hollon, 2010). It is thought that disorder-specific symptoms develop as a result of a particular pattern of dysfunctional cognitions in combination with a set of behaviours that serve to exacerbate these dysfunctional cognitions further (Beck et al., 1979). As such, CBT works to improve symptoms by treating these maladaptive cognitions and behaviours.

In essence, cognitive techniques and behaviour modification strategies are used to identify, evaluate, and challenge underlying maladaptive thoughts and beliefs (Weishaar & Beck, 1987). For example, it is thought that catastrophic thoughts about the outcomes of experiencing arousal-related physiological sensations, as well as inaccurate predictions about the probability of these dangerous outcomes, and avoidance of situations that may induce these sensations contribute to the development and maintenance of PD (Barlow, 1988; Clark, 1986). Accordingly, CBT for panic uses cognitive restructuring techniques to teach individuals to identify and challenge their maladaptive cognitions and beliefs. This is combined with the use of behavioural experiments and gradual, repeated exposure to feared sensations to help individuals revise their perceptions of threat and reduce their fear of these arousal-related physiological sensations (Landon & Barlow, 2004). A

similar description of the CBT model could be provided for the other anxiety disorders (e.g. SP; Heimberg, 2002). Whereas the underlying cognitive and behavioural principles are evident in the CBT interventions for each of the anxiety disorders, current forms of CBT also target core components of a particular disorder and as such specific models of CBT now exist for each disorder, which modify and adapt CBT principles to fit disorder-specific symptoms (e.g., specific phobia, Rachman, 1978; OCD, Salkovskis, 1985; PD, Clark, 1986; SP, Clark & Wells, 1995; GAD, Wells, 1995; PTSD, Ehlers & Clark, 2000).

Distance CBT therapists would be expected to draw on these models in the same manner as face-to-face CBT therapists. Researchers have explored various distance-delivery methods (Reger & Gahm, 2009), ranging from using the telephone to extend therapist-client contact between sessions, to administering entire treatments by means of communication technologies. Typically, distance CBT involves the client following a written treatment program available by mail or the Internet, in conjunction with receiving therapist support, either via telephone calls, texts, or email (Andersson et al., 2006). In general, distance delivery methods can be separated into five somewhat distinct categories: (a) telephone-based therapy; (b) Internet-based therapy with therapist support via telephone or email; (c) therapy conducted using videoconferencing; (d) therapy conducted using live typed chat; and (e) printed materials-based therapy with therapist support via telephone or email. In each case, the intervention involves content that mimics that of face-to-face CBT, therapist-client contact (albeit through non-traditional means), and the client engaging in further "homework" outside of the session. As such, we anticipated that CBT delivered via any of these distance methods will work in the same way and as well as traditional face-to-face CBT.

Why it is Important to Do This Review

Recently, research into distance treatment has elicited considerable interest from within the scientific and clinical communities. With advances in modern communication technologies and their widespread availability, this type of treatment is quickly becoming a more realistic option. These advances have come at a time when long waiting lists and a lack of treatment availability stand in stark contrast to the growing emphasis on the importance of mental health and provision of evidence-based treatments. A desire to pursue distance treatment as a viable option to increase access to treatment is growing. The importance of ensuring that the decision to promote such treatment is grounded firmly in high quality evidence is therefore paramount.

The present review asked whether therapist-supported distance CBT (therapy that mimics face-to-face CBT but is simply delivered via a distance-based method) is efficacious in treating anxiety and if it is as efficacious as face-to-face CBT. To date, the evidence base on the efficacy of therapist-supported distance CBT for anxiety disorders in particular has not been systematically evaluated. Past meta-analyses have looked at the efficacy of distance treatment for mental health symptoms (e.g., Spek et al., 2007) or for mental health in general (e.g., Bee et al., 2008), or have examined the efficacy of particular types of distance delivery (e.g., computer-based; Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Cuijpers et al., 2009; Reger & Gahm, 2009), or have not focused on the role of therapist involvement (e.g., Andrews et al., 2010; Cuijpers et al., 2009; Reger & Gahm, 2009).

A Cochrane Review on media-delivered CBT and BT (self-help) for anxiety disorders is in progress (Mayo-Wilson & Montgomery, 2007). Mayo-Wilson and

Montgomery's (2007) review will begin to answer questions about the efficacy of delivering CBT to clients in non-traditional formats, however, the focus of the review is largely on self-help therapies in which therapist involvement is not necessary and treatment is largely client-directed. As such, a meta-analysis with a particular emphasis on the efficacy of therapist-supported distance CBT is needed; it will fill a gap in the literature and answer current calls for research in the area (Reger & Gahm, 2009).

Objectives

The objective of this review was to examine the efficacy of therapist-supported distance CBT for the treatment of anxiety disorders in adults as compared to waiting list control, treatment-as-usual, non-CBT therapist-supported distance interventions, non-therapist-supported distance CBT, non-therapist-supported non-CBT distance interventions, and face-to-face CBT.

Method

Criteria for Considering Studies for This Review

Types of studies. We included randomized controlled trials (RCTs), cross-over trials, and cluster randomized trials.

Types of participants.

Participant characteristics. We included studies of adults (over 18 years of age; no upper limit).

Diagnosis. We included participants with a primary diagnosis of an anxiety disorder according to DSM-III (APA, 1980), DSM-III-R (APA, 1987), DSM-IV (APA, 1994), DSM-IV-TR (APA, 2000), ICD-9 (WHO, 1979) or ICD-10 (WHO, 1999) diagnostic criteria. We included studies that focused on, or adequately reported subgroup

information for any of the following anxiety disorders: PD with or without agoraphobia, agoraphobia without a history of panic, SP (social anxiety disorder), PTSD, acute stress disorder, OCD, specific phobia, GAD, and anxiety disorder not otherwise specified (ADNOS). Included studies determined diagnoses using a validated diagnostic instrument (e.g., Structured Clinical Interview for DSM-IV Axis I Disorders, SCID; First, Spitzer, Gibbon, & 2002).

Setting. We included studies in which treatment entailed participants engaging in treatment from their homes and therapists located at primary care settings, university laboratories, community mental health clinics, and/or private practice clinics.

Comorbidities. We included studies of participants with comorbid diagnoses (e.g., major depressive disorder, substance abuse, etc.) only if they had been diagnosed with a primary anxiety disorder. We did not include studies of participants reporting anxiety symptoms that did not meet criteria for an anxiety disorder (e.g., participants with a clinical presentation of major depressive disorder who reported sub-threshold anxiety symptoms or participants scoring high on measures of anxiety symptoms but who were not assessed for a DSM diagnosis).

Types of interventions.

Experimental interventions. We included studies that investigated the efficacy of a sufficiently therapist-supported distance CBT, behaviour therapy (BT), or cognitive therapy (CT) intervention for anxiety, defined as:

- BT interventions must have been designed to change the behaviours that result from maladaptive anxiety-related cognitions (we included interventions including, but not limited to, exposure, desensitization, and behavioural experiments);

- CT must have been focused on elements of cognitive restructuring of irrational or maladaptive anxiety-related cognitions;

- CBT interventions consisted of some combination of the elements of CT and BT.

Whereas psychoeducation often is an important part of CBT, we did not consider psychoeducation alone to be a sufficient CBT intervention unless it included some of the other treatment components described here.

To be considered a distance intervention, CBT must have been administered via some type of remote communication technology. Based on the unique characteristics of different types of distance delivery (i.e., nature of contact with therapist, amount of homework done by clients outside of therapy) we included interventions that fell into one of the following categories:

- telephone-based therapy;

- Internet-based therapy with therapist support provided over the telephone or by email;

- therapy conducted via videoconferencing technologies;

- therapy conducted via live typed chat; or

- printed materials-based therapy with therapist support provided on the telephone or over email.

Crucially, interventions must have included therapist contact but could not be delivered in person. We included interventions that involved an initial face-to-face intake and/or interview session and/or an initial session to orient clients to the delivery method or to engage in treatment planning. We did not select interventions based on their length, or the

number or duration of sessions. We conducted subgroup analyses stratified by type of distance method according to the categories above.

Comparator interventions. We included studies that investigated the experimental intervention in comparison to one of:

1. waiting list control;

2. treatment-as-usual, also referred to as standard care;

3. other therapist-supported distance interventions consisting of any type of treatment other than CBT (for example, psychoeducation only, non-directive supportive therapy, interpersonal therapy, etc.) delivered over a distance in one of the methods described previously;

4. non-therapist-supported distance CBT (i.e., without therapist contact, e.g. self-help therapies using printed materials, audio and video recordings, online websites etc.);

5. other non-therapist-supported distance interventions (including any type of non-CBT treatment delivered over a distance without any therapist contact); and

6. conventional face-to-face CBT interventions (including any CBT delivered in a traditional face-to-face format including both individual and group interventions).

Types of outcome measures.

Primary outcomes. The first primary outcome was efficacy of therapist-supported distance CBT in reducing anxiety, as measured by the following:

- remission of anxiety disorder diagnosis (as defined by the version of the DSM or ICD applicable to each particular study) as determined by a diagnostic interview (e.g., SCID, First et al., 2002; Anxiety Disorders Interview Schedule, ADIS-IV,

DiNardo, Brown, & Barlow, 1994) or a defined cut-off on a validated scale (e.g.,

Yale Brown Obsessive Compulsive Scale, YBOCS; Goodman et al., 1989). In

case the Clinical Global Impression scale change item (CGI-C; Guy, 1976) is

used, we employed a score of 1 = *very much* or 2 = *much improved* to indicate

remission

- reduction in anxiety symptom severity measured by scores on a validated,

  observer-rated instrument (e.g., Hamilton Anxiety Rating Scale; Hamilton, 1959)

  or a validated self-report measure of (a) disorder-specific symptoms (e.g., Social

  Phobia Scale, SPS; Mattick & Clarke, 1998) and (b) anxiety symptoms in general

  (e.g., Beck Anxiety Inventory, BAI; Beck & Steer, 1991).

The second primary outcome assessed was occurrence of adverse effects/events as

reported by study authors.

  Secondary outcomes. Quality of life was as assessed by measures of quality of

life, for example, the Quality of Life Inventory (QOLI; Frisch, Cornell, Villaneuva, &

Retzlaff, 1992), or measures of disability, for example the Sheehan Disability Scales

(SDS; Leon, Olfson, Portera, Farber, & Sheehan, 1997) as increasing disability entails

decreased quality of life. While research suggests that quality of life and disability are

distinct but somewhat overlapping constructs (Hambrick, Turk, Heimberg, Schneier, &

Liebowitz, 2003), quality of life measures have not often been conceptually or

operationally distinguished from measures of disability, resulting in considerable overlap

among indices of quality of life and disability (Mogotsi, Kaminer, & Stein, 2000). With

this in mind, we anticipated an overlapping conceptualization of these two constructs in

the included studies and included both types of measures within the meta-analysis to capture all possible information about treatment outcome related to quality of life.

Participant satisfaction with the intervention was assessed as a secondary outcome. Participant satisfaction tends to be measured uniquely across studies using a mix of qualitative and quantitative indices. In anticipation of this, we evaluated participants' satisfaction with the intervention of interest and as compared to the comparator interventions in a qualitative manner.

Timing of outcome assessment. We performed separate analyses based on different periods of assessment: immediately post-treatment and at one follow-up period at least six months post-treatment but not more than one year.

Search Methods for Identification of Studies

We used several methods to identify both published and unpublished studies for possible inclusion in this review (see below). We did not restrict studies to those reported in any particular language; however, we conducted searches in English and initiated contact with authors in English.

Electronic searches.

CCDAN registers. The Cochrane Collaboration Depression, Anxiety and Neurosis Group (CCDAN) maintains two clinical trials registers (CTR) at their editorial base in Bristol, UK: a references register and a studies-based register. The CCDANCTR-References contains over 26,000 reports of trials on depression, anxiety, and neurosis. Approximately 65% of these references have been tagged to individual, coded trials. The coded trials are held in the CCDANCTR-Studies and records are linked between the two

registers through the use of unique Study ID tags. Coding of trials is based on the EU-Psi coding manual. Please contact the CCDAN Trials Search Co-ordinator for further details.

Reports of trials for inclusion in the Group's registers are collated from routine (weekly), generic searches of MEDLINE, EMBASE and PsycINFO; quarterly searches of the Cochrane Central Register of Controlled Trials (CENTRAL), and review-specific searches of additional databases. Reports of trials are also sourced from international trials registers via the World Health Organization's International Clinical Trials Registry Platform (ICTRP; http://apps.who.int/trialsearch/), drug companies, the handsearching of key journals, conference proceedings, and other (non-Cochrane) systematic reviews and meta-analyses. Details of CCDAN's generic search strategies can be found in the 'Specialised Register' section of the Cochrane Depression, Anxiety and Neurosis Group's module text. We searched the CCDAN Registers in July 2011 and again in October 2012 to update the previous search.

We searched the CCDANCTR-Studies register using the following search strategy:

1. Condition = (anxiety or *phobi* or PTSD or post-trauma* or "post trauma*" or posttrauma* or "stress disorder" or panic or OCD or obsess* or compulsi* or GAD)

2. Intervention = (CBT or cognitive or behavio* or *therap* or treatment or intervention or training or counsel*)

3. Age Group = (adult or aged or unclear or "not stated")

4. Free-Text = (computer* or distance* or remote or tele* or Internet* or web* or WWW or phone or mobile or e-mail* or email* or online* or on-line or videoconferenc* or

video-conferenc* or "chat room*" or "instant messaging" or iCBT)

5. (1 and 2 and 3 and 4)

We searched the CCDANCTR-References register using the following strategy:

1. (anxiety or *phobi* or PTSD or post-trauma* or "post trauma*" or posttrauma* or (stress and disorder*) or panic or OCD or obsess* or compulsi* or GAD):ti,ab,kw

2. (therap* or train*):ti,ab

3. (psychotherap* or cognitive or behavio* or CBT):ti,ab,kw

4. (acceptance* or assertive* or brief* or commitment* or exposure or group or implosive or "problem solving" or problem-solving or "solution focused" or solution-focused or schema):ti,ab,kw

5. (CBT or cognitive or behavio* or "contingency management" or "functional analys*" or mindfulness* or "mind training" or psychoeducat* or relaxation or "role play*"):ti,ab,kw

6. ((2 or 3) and 4) or 5

7. (computer* or distance* or remote or tele* or Internet* or web* or WWW or phone or mobile or e-mail* or email* or online* or on-line or videoconferenc* or video-conferenc* or "chat room*" or "instant messaging" or iCBT):ti,ab,kw

8. 1 and 6 and 7

Searching other resources.

Reference lists. We examined the reference lists of previous meta-analyses (Andrews et al., 2010; Bee et al., 2008; Cuijpers et al., 2009; Cuijpers et al., 2010; Reger & Gahm, 2009; Spek et al., 2007) and of articles selected for inclusion in the present review.

Personal contacts/correspondence. We contacted experts in the field, including principal authors of randomized controlled trials in the field of distance CBT for anxiety, via email and asked them if they were aware of any further studies which meet the present review's inclusion criteria.

Conference abstracts. We searched the abstracts from the annual conferences of the Association for Behavioural and Cognitive Therapies and the Anxiety Disorders Association of America for additional, as yet unpublished, studies.

Unpublished studies. In order to search for unpublished studies, we searched international trial registries including the World Health Organization's ICTRP (http://apps.who.int/trialsearch/) and the CCDAN registers (see above).

Data Collection and Analysis

Selection of studies. In collaboration with the CCDAN Trials Search Co-ordinator, one review author (JVO) conducted searches of electronic databases and reference lists and contacted authors to locate potential trials to be included in the review. Two review authors (JVO and KMB) independently assessed the titles and abstracts of the resulting lists of studies for relevance. We then obtained full articles for potentially relevant abstracts. Both review authors assessed the identified trials independently to determine eligibility as outlined in the criteria for considering studies for this review. We collated and compared assessments; in the case of disagreement with respect to trial eligibility, we made the final decision by discussion and consensus, if necessary with the involvement of another member of the review group (MCW and/or SHS).

Data extraction and management. We extracted data regarding methodology and treatment outcomes from the included studies independently and recorded data using

a data extraction spreadsheet designed by one of the review authors (JVO). If the included trials did not provide complete information (e.g., details of drop-out, group means and standard deviations, etc.), we contacted the primary investigator by email to attempt to obtain unreported data to permit an ITT analysis. We contacted other investigators as needed.

Two review authors (JVO and KMB) extracted the following data independently from each trial report and recorded the data in RevMan 5.1 data tables (Cochrane Collaboration, 2008):

1. description of trials, including primary researcher and year of publication;

2. characteristics of trial methodology, including the diagnostic criteria employed, participant inclusion/exclusion criteria, the screening instrument(s) used, the inclusion/exclusion of comorbidity, the receipt of other interventions simultaneously, and the number of centres involved;

3. characteristics of participants, including age, gender, primary diagnosis, any comorbid diagnoses and duration of primary symptoms;

4. characteristics of the intervention (for both the experimental and comparator interventions), including intervention classification (i.e., CBT, BT, CT), content and components (e.g., psychoeducation, relaxation training, exposure, cognitive restructuring), delivery method (e.g., telephone, video conferencing, email), duration, amount of therapist/experimenter contact, and number of participants randomised to each intervention; and

5. outcome measures employed, as listed in the types of outcome measures section above, as well as the drop-out rates for participants in each treatment condition

and whether the data reflect ITT analyses with last observation carried forward (LOCF) or another method.

Main planned comparisons. We planned to compare each of the outcomes of interest, at post-treatment and six-12 month follow-up, for each of the following comparisons:

1. Therapist-supported distance CBT vs. waiting list control

2. Therapist-supported distance CBT vs. treatment-as-usual

3. Therapist-supported distance CBT vs. other therapist-supported distance non-CBT intervention;

4. Therapist-supported distance CBT vs. non-therapist-supported distance CBT

5. Therapist-supported distance CBT vs. non-therapist-supported distance non-CBT interventions

6. Therapist-supported distance CBT vs. face-to-face CBT

Assessment of risk of bias in included studies. We assessed the risk of bias in each included study using the Cochrane Collaboration's 'Risk of bias' tool (Higgins & Green, 2009). We assessed the following six areas for risk of bias:

1. Sequence generation: was the allocation sequence of participants adequately randomised?

2. Allocation concealment: was the allocation sequence adequately concealed from participants as well as those involved in the enrolment and assignment of participants?

3. Blinding: were participants, study personnel, and those assessing outcomes kept unaware of participants' allocation to a study condition throughout the course of the investigation?

4. Incomplete outcome data: were there incomplete data for the main or secondary outcomes (e.g., due to attrition)? Were incomplete data adequately addressed?

5. Selective reporting: was the study free of suggestions of selective reporting of outcomes (e.g., reporting of a subset of outcomes on the basis of the results)?

6. Other potential threats to bias: was the study free of any other problems (e.g., early stopping, baseline imbalance, cross-over trials, etc.) that could have introduced bias?

Two review authors (JVO and KMB) independently assessed risk of bias for each included study. We resolved disagreements by consensus and discussion with a third review author (MCW or SHS) where necessary. If further information about a particular trial was required to assess its risk of bias, we contacted the primary investigator of the relevant study. We created 'Risk of bias' tables describing the information outlined above, as reported in each study. These tables also include a judgement on the risk of bias made by the review authors for each of the six areas based on the following three categories: (1) low risk of bias, (2) high risk of bias, and (3) unclear or unknown risk of bias.

Measures of treatment effect.

Dichotomous outcomes. We analysed our only dichotomous outcome - remission of anxiety disorders (yes/no) - using odds ratios (ORs) and 95% confidence intervals (CIs) within studies.

Continuous outcomes. As most studies selected for inclusion used different measures to assess sufficiently similar constructs, we compared continuous outcomes (i.e. reduction in general and disorder-specific anxiety symptom severity; quality of life) by calculating the standardized mean difference (SMD) and its 95% confidence interval. However, when all of the studies within a meta-analysis used the same measure to assess an outcome (for example, if all studies within a meta-analysis used the BAI to assess general anxiety symptoms), we compared continuous outcomes by calculating the mean difference (MD) to facilitate the interpretation of the clinical relevance of the findings.

Most included studies used more than one measure to assess each of the continuous outcomes. Thus, a mean score was created across the measures included within each study. Measures of variance for this mean score were created by combining standard deviations across studies according to the method described by Borenstein, Hedges, Higgins, and Rothstein (2009). This method requires the correlation between two measures be known; as such, on the rare occasion when this correlation was not known and could not be identified in prior literature, the measure in question was excluded from analyses. To combine measures of quality of life and disability into one outcome, we reversed the scores of the disability measures (i.e., by subtracting mean scores from the measure total scores) to align them with the quality of life measures.

Endpoint versus change data. We anticipated that we might encounter some studies that reported analyses based on changes from baseline and other studies that reported analyses based on final values. We planned to present the two types of analysis results in separate subgroups to avoid confusion for readers and where appropriate to

combine both types of scores in the final results. Despite these plans, none of the included studies reported change data so we used endpoint data in all meta-analyses.

Skewed data. We dealt with skewed data according to guidelines in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins & Green, 2009) and those published by Higgins, White, and Anzures-Cabrera (2008). In order to conduct the final analysis, transformed or untransformed data had to be obtained for all studies because log-transformed and untransformed data cannot be combined in meta-analyses (Higgins & Green, 2009). In the case that a limited number of studies included in one meta-analysis presented log-transformed data, we back-transformed this data and included untransformed data in the meta-analysis. We then conducted a sensitivity analysis excluding any studies that presented transformed data.

Unit of analysis issues.

Cross-over trials. A number of included studies were cross-over trials. In these trials, participants randomly assigned to a waiting list control condition were permitted to cross-over and pursue the active treatment after their period on the waiting list was complete. To analyze dichotomous and continuous data for these trials, we only included data from participants before they crossed over to their second treatment condition; in other words, only data from the original comparison (waiting list vs. therapist-supported distance CBT) was used in the meta-analyses.

Cluster-randomized trials. When cluster-randomized trials had accounted for clustering within their analyses (through the use of multilevel modelling or general estimating equations, for example) we planned to include data directly in the meta-analyses. For studies that failed to appropriately account for clustering, we planned to

impute the data, following the procedure outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins & Green, 2009), based on the number of clusters reported in each intervention group, the size of each cluster, summary statistics and an estimate of intracluster correlation. We also planned to exclude cluster trials with a high risk of bias (i.e., where clustering was not accounted for in analyses) from sensitivity analyses.

Multiple intervention arms. Several studies with multiple intervention arms met our inclusion criteria. In such cases, we selected paired intervention and comparison arms that best met our selection criteria. We planned to conduct sensitivity analyses excluding any studies with multiple intervention arms that did not report all intervention comparisons.

Dealing with missing data. We used data from ITT analyses whenever they were reported by study authors. In most cases, authors employed a LOCF method to address missing data with the assumption that participants who are missing data following randomisation (i.e., dropouts) did not respond to treatment. Because included studies did not report individual participant data, if authors did not provide ITT analyses in their manuscript, we contacted the primary investigator by email to attempt to obtain unreported data to permit an ITT analysis. When we did not receive responses from study authors we simply included their reported, non-ITT continuous outcome data in the analysis. This was the case for seven studies (Andersson et al., 2009; Frueh et al., 2007b; Hecker, Losee, Roberson-Nay, & Maki, 2004; Litz, Engel, Bryant, & Papa, 2007; McNamee, O'Sullivan, Lelliott, & Marks, 1989; Strachan, Gros, Ruggiero, Lejuez, & Acierno, 2012; Swinson, Fergus, Cox, & Wickwire, 1995). For dichotomous outcomes,

we were able to impute ITT data by assuming that participants who had dropped out did not meet the target event (i.e., diagnostic remission). We conducted sensitivity analyses excluding studies for which ITT data was not available (either from the published manuscript or from study authors) to determine the extent to which missing data influenced effect sizes.

If included trials did not provide complete information (i.e., group means and standard deviations and numbers included in analyses), we contacted the primary investigator by email to attempt to obtain unreported data. We contacted other study investigators as needed. If standard deviations were not available from the authors, we planned to calculate these using other data reported in the article, including t-values, confidence intervals, and standard errors. If that was not possible, we planned to impute standard deviations from other investigations using similar measures and populations.

Assessment of heterogeneity. We tested the extent of statistical heterogeneity in meta-analyses using the I^2 statistic (Higgins & Thompson, 2002), which calculates the percentage of variability due to heterogeneity rather than chance. According to the guidelines outlined in the *Cochrane Handbook for Systematic Reviews of Interventions*, I^2 values may be interpreted as follows:

- 0% to 40% might not be important;
- 30% to 60% may represent moderate heterogeneity;
- 50% to 90% may represent substantial heterogeneity; and
- 75% to 100% represents considerable heterogeneity (Higgins & Green, 2009).

We interpreted the importance of these I^2 values in consideration of the magnitude and direction of effects and the strength of evidence for heterogeneity (as indexed by the *p*

value from the χ^2 test). If there was evidence of heterogeneity, we first re-checked the data for accuracy. We considered sources of heterogeneity according to the pre-specified subgroup and sensitivity analyses listed in the subgroup analysis and investigation of heterogeneity section above.

Assessment of reporting bias. Where there were sufficient numbers of trials to make such a plot meaningful (i.e., at least 10 included studies: Higgins & Green, 2009), we constructed funnel plots to determine the possible influence of publication bias. We enhanced funnel plots with contour lines delineating areas of statistical significance (as suggested by Peters, Sutton, Jones, Abrams, & Rushton, 2008), to assist in the differentiation of asymmetry due to publication bias or other causes.

Data synthesis. We combined data using an inverse-variance random-effects model due to expected variation in the characteristics of the interventions investigated and participant populations. We combined dichotomous outcome measures by computing a pooled odds ratio and 95% CI. We combined continuous outcomes when means and standard deviations were available. When sufficiently similar continuous outcomes were measured differently across studies we calculated an overall standardized mean difference and 95% CI. However, as indicated previously, when outcomes were measured similarly across studies we used a mean difference method. We used RevMan 5.1 software for data synthesis.

Subgroup analysis and investigation of heterogeneity. We conducted subgroup analyses, but interpreted these with caution, due to the risk of false positive conclusions. We planned to perform the following subgroup analyses:

1. gender of participants;

2. type of anxiety disorder (i.e., PD with or without agoraphobia, agoraphobia without a history of panic, SP (social anxiety disorder), PTSD, OCD, specific phobia, GAD, and ADNOS);

3. type of distance delivery based on the five categories described in the types of interventions section;

4. amount of therapist contact, designated as low (90 minutes or less), medium (91-299 minutes), or high (300 minutes or more); and

5. type of CBT (i.e., BT, CT, or CBT).

We were not able to conduct a subgroup analysis based on gender of participants, as none of the included studies distinguished outcomes based on this participant variable.

We also were not able to conduct a subgroup analysis based on type of CBT. Only one study (Morland, Hynes, Mackintosh, Resick, & Chard, 2011) had a stronger focus on CT, as compared to BT or CBT. Similarly, only three studies focused on BT (Andersson et al., 2009; McNamee et al., 1989; Swinson et al., 1995) and each compared BT to a different comparator treatment: face-to-face BT, applied relaxation via telephone, and waiting list control, respectively.

Sensitivity analysis. We conducted sensitivity analyses to determine the extent to which observed pooled effect sizes depend on the quality of the design characteristics of studies. We planned to conduct the following sensitivity analyses:

1. exclusion of studies with a designation of high risk of bias for one or more of the categories as outlined in the assessment of risk of bias in included studies section;

2. exclusion of cluster randomised trials where clustering was not appropriately accounted for in analysis;

3. exclusion of studies with multiple intervention arms with selective reporting of intervention comparisons;

4. exclusion of studies with imputed standard deviations for continuous outcomes;

5. exclusion of studies not reporting (a) dichotomous and (b) continuous outcomes according to the ITT principle; and

6. exclusion of studies with continuous outcomes analysed using LOCF.

Results

Description of Studies

Results of the search. The electronic search of databases (conducted October 2012), yielded 709 citations for consideration for inclusion in the review, including manuscripts in peer-reviewed journals, conference abstracts, and clinical trial registrations. Employing secondary search methods, including searching clinical trial registries, contacting experts in the field, and searching the reference lists of eligible studies, resulted in another 1439 citations for consideration. After de-duplication and following a brief screening of the titles and abstracts, 216 were retrieved for a more detailed evaluation of eligibility. One hundred forty-five studies were subsequently excluded for failing to meet our inclusion criteria. The PRISMA flow diagram shown in Figure 2.1 outlines the study selection process and broad reasons for exclusion. Studies were excluded if (a) participants did not meet diagnostic criteria for an anxiety disorder, as assessed by study authors (Population), (b) the intervention of interest was not CBT, not distance delivered, did not involve a therapist, and/or included too much face-to-face therapist contact (Intervention), (c) the comparator was not appropriate given our selection criteria (Comparator), (d) the trial was not randomised, did not use adequate

diagnostic measures, or was not conducted (Methods), or (3) the trial was ongoing (Ongoing).

After accounting for duplicate reports of the same trial, 38 studies were eligible for inclusion in our review. One study was not included in quantitative analyses because outcome data was not presented independently for each study intervention (Hecker et al., 2004) while a second was not included because only median data was available (Morland et al., 2011), resulting in a final inclusion of 36 trials in the meta-analyses.

Included studies. See Table 2.1 for a summary table of the characteristics of the included studies.

Design. All of the 38 included studies were randomised controlled trials. Eighteen studies were cross-over trials. There were no cluster trials. Eight studies included multiple intervention arms: three (Furmark et al., 2009a; Furmark et al., 2009b; Titov, Andrews, Choi, Schwencke, & Mahoney, 2008c) compared the intervention of interest to two eligible comparators so were included in multiple meta-analyses, four (Berger et al., 2011; Johnston, Titov, Andrews, Spence, & Dear, 2011; Richards, Klein, & Austin, 2006, Robinson et al., 2010) included a third treatment arm not relevant to the present review, and one (Klein, Richards, & Austin, 2006) included two intervention arms of interest so we included the intervention that was most similar to those investigated in other studies.

Sample sizes. Sample sizes of included studies ranged from 13 (Morland et al., 2011) to 204 participants (Andersson, Carlbring, & Furmark, 2012a). The average study sample size was 67 participants.

Setting. Included studies came primarily from one research group in Sweden (15 trials), two groups in Australia (Klein: three trials; Titov: 10 trials), and several loosely

affiliated centres in the United States (four trials). The remaining studies were conducted in Switzerland (two trials), the United Kingdom (two trials), the United States (one trial) and Canada (one trial). Whereas researchers and treating clinicians were located at universities, university-affiliated hospitals or mental health centres, participants received the intervention of interest in their home. Treatment took place over the Internet and telephone. Face-to-face CBT, when included in a trial, was conducted in a psychiatric setting (e.g., university clinic, hospital, mental health clinic).

Participants. Participants were men and women over 18 years of age. The average age of participants across included studies was 38.2 years. Women represented an average of 62% of participants in each study (or 65% when excluding two studies of male military populations). The ethnicity of participants was not reliably reported. For many studies, participants were recruited via media advertisements or a recruitment website (30 studies); in a minority of studies, participants were recruited via clinic referrals (eight studies).

All included participants qualified for one of the following anxiety disorder diagnoses: PD with or without agoraphobia (11 trials), SP (11 trials), PTSD (five trials), GAD (three trials), specific phobia (one trial), OCD (one trial), and agoraphobia (one trial). The five remaining studies included participants with a range of anxiety disorder diagnoses. Thirty-one trials included participants with comorbid diagnoses, one study excluded comorbidities, and six studies did not report on their inclusion/exclusion. Among all studies, regardless of their inclusion/exclusion of comorbidity, 27 studies excluded participants who scored above a certain threshold on a measure of depressive symptoms (e.g., above 30 on the Montgomery-Asberg Depression Rating Scale,

MADRS; Svanborg & Asberg, 1994) and 29 studies excluded participants who endorsed suicidal ideation (e.g., on the MADRS suicide item), with the rationale that they were unclear about how to handle this high risk participant via a distance treatment. Twenty-three studies excluded participants with substance misuse/dependence problems and 21 studies excluded participants with active psychosis, with the rationale that these problems would interfere with anxiety treatment.

Thirty-six trials included participants who were using psychiatric medication (including selective serotonin reuptake inhibitors, serotonin norepinephrine reuptake inhibitors, benzodiazepines, benzodiazepine derivatives, neuroleptics, tricyclic antidepressants, beta-blockers) concurrent with study participation. Participants were typically included only if they had been at a stable dose for a certain time period (one to three months) preceding the study. Five studies included participants engaged in another type of psychological therapy concurrent with study participation.

Interventions.

Experimental interventions. The 38 studies included in the present review include a range of interventions that all share the characteristics of being CBT, distance-based, and therapist-supported. Thirty-three studies tested a CBT intervention, one tested a CT intervention called Cognitive Processing Therapy (Morland et al., 2011), and four investigated BT with a focus on exposure (Andersson et al., 2009; McNamee et al., 1989; Strachan et al., 2012; Swinson et al., 1995).

The majority of the included interventions ($n = 31$) involved Internet-based CBT with participants following five to 15 online treatment modules (mean = 8; median = 8; mode = 6) with email support from therapists. Seven of these studies also provided

therapist support by telephone (Johnston et al., 2011; Litz et al., 2007; Robinson et al., 2010; Spence et al., 2011;Titov et al., 2009; Titov, Andrews, Johnston, Robinson, & Spence, 2010b; Titov et al., 2011) while another seven of these studies also included participation in an online discussion forum (Andersson et al., 2012a; Bergstrom et al., 2010; Furmark et al., 2009a; Furmark et al., 2009b; Spence et al., 2011; Tillfors et al., 2008; Titov et al., 2011). Of the non-Internet-based studies, three studies (Frueh et al., 2007b; Morland et al., 2011; Strachan et al., 2012) involved an eight- to 14-session group CBT intervention delivered via videoconferencing, three studies investigated a bibliotherapy-based intervention supplemented by therapist telephone support (Hecker et al., 2004; McNamee et al., 1989; Swinson et al., 1995), and one study tested a 10-week telephone therapy intervention (Lovell et al., 2006).

Interventions ranged in length from four to 15 weeks (mean = 9; median = 9; mode = 10), not including one study which permitted participants 28 weeks to complete the intervention (Carlbring, Ekselius, & Andersson, 2003). The degree of therapist involvement in the included interventions was widely variable. Several interventions were completely delivered by a clinician, in the same manner as traditional face-to-face CBT (Frueh et al., 2007b; Lovell et al., 2006; Morland et al., 2011; Strachan et al., 2012). The degree of therapist involvement in the bibliotherapy interventions ranged from 60 to 480 minutes. The variability in the Internet-delivered interventions was the greatest; the average total time spent by a therapist per participant ranged from a minimum of 25 minutes (Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001) to a maximum of 376.3 minutes (Richards et al., 2006) with an overall mean of 139.3 minutes and median of 125 minutes. Similarly, the average number of emails sent by study therapists

ranged from a minimum of 5.5 (Berger, Hohl, & Caspar, 2009) to a maximum of 23.7 (Titov et al., 2009) with an overall mean of 12.7 emails and median of 12 emails.

Comparator interventions. Twenty-two studies compared the experimental intervention to a waiting list, attention, or information-only control condition. Four studies compared the experimental intervention to non-CBT therapist-supported distance interventions (i.e., applied relaxation: Carlbring et al., 2003; Furmark et al., 2009b; McNamee et al., 1989; supportive counselling: Litz et al., 2007). Four studies compared therapist-supported distance CBT to unguided distance CBT (i.e., self-help). Finally, 11 studies compared the experimental intervention to traditional, face-to-face group or individual CBT. This number of studies adds up to more than the total number of studies because several studies included more than one comparator.

Outcomes.

Primary outcomes. Each of the included studies reported on the efficacy of therapist-supported distance CBT. Eighteen studies reassessed participants post-treatment for remission of anxiety disorder diagnosis and six studies reassessed diagnostic outcome at a follow-up of six months or greater. Each of the included studies reported on participants' disorder-specific anxiety symptom severity using a validated self-report or observer-rated instrument. Fifteen studies assessed anxiety symptom severity at a follow-up of six months or greater. Twenty-four of the included studies also measured participants' symptoms of general anxiety using validated self-report instruments. Ten studies assessed general anxiety at a follow-up of six months or greater. No studies measured or reported any adverse effects or events.

Secondary outcomes. Twenty-six studies measured quality of life at post-treatment, while eight studies included quality of life as an outcome at six to 12 month follow-up. Participant satisfaction with treatment was indexed by 20 studies at post-treatment. A variety of different measures of treatment satisfaction were used ranging in degrees of comprehensiveness and complexity. Across different measurement approaches, participants were most commonly asked to indicate their overall satisfaction with the treatment program, their satisfaction with particular portions of the treatment program (e.g., therapist correspondence, Internet modules), and their satisfaction with the pace of the treatment program. Of the 20 studies, only six reported treatment satisfaction for both the experimental and comparator interventions; the remaining trials compared the experimental intervention to a waiting list control which did not lend itself to an evaluation of satisfaction.

Excluded studies. Studies were excluded for a variety of reasons (see Figure 2.1). Studies were frequently excluded because the intervention was (a) not distance-based, (b) distance-based but included more than two sessions of face-to-face contact between therapist and participant, (c) not supported by a therapist (i.e., a self-help program), or (d) not CBT. Similarly, studies were excluded if participants did not meet our criteria because they had subclinical anxiety symptoms or an anxiety disorder was not their primary diagnosis. We also excluded a number of studies because a closer look showed that they were not randomised controlled trials or did not compare the intervention of interest to a comparison group that met eligibility criteria.

Ongoing studies. We identified 20 ongoing studies (see Appendix A).

Risk of Bias in Included Studies

Results of the risk of bias assessments of included studies are summarized

succinctly in Table 2.2. Overall, the risk of bias in the included studies is low, with some

notable exceptions related to the nature of clinical trials of psychological treatments.

Allocation (selection bias). The majority of included studies ($n = 32$) used an

adequate method of randomization, primarily an online random number generator, to

avoid selection bias. Of the remaining studies, five reported that participants were

randomized but did not describe the randomization procedure. The final study (Klein et

al., 2006) has a high risk of selection bias due to the use of a sequential randomization

procedure. Most study authors ($n = 31$) did not adequately report allocation concealment.

The remaining seven studies reported allocation concealment procedures that would have

minimized the risk of selection bias (e.g., random assignment was maintained by an

independent research team member who was not involved in other aspects of the study

and who revealed randomization to participants just prior to treatment commencement).

Blinding (performance bias and detection bias). The blinding of participants

and study personnel is difficult when investigating the efficacy of psychological

treatments. Unlike pharmacological trials in which medication type can be concealed, it is

very difficult to blind participants to the characteristics of the treatment they are receiving

as they are active participants. Similarly, it is impossible to blind study therapists to the

treatment they are delivering as they take an active role in its execution. As such, each of

the included studies could be rated as having a high risk of bias because participants and

personnel are not blind to treatment assignment. However, as this is standard practice

with this type of clinical trial, this is not a limitation of the included studies and we did not conduct sensitivity analyses based on this study characteristic.

We indexed blinding of outcome assessment separately for self-report versus observer/interview-rated outcome measures. As participants are not blind to their treatment condition in the included studies, self-report outcomes measured in all of the included studies are not blinded. Twenty studies measured outcomes using observer-rated instruments. In 14 of these studies, interviewers blind to treatment condition conducted outcome assessments ensuring a low risk of bias. Of the remaining six studies, one was compromised by participants who too frequently revealed their treatment condition to interviewers (Berger et al., 2011) and five used at least one interviewer who was aware of participants' random assignment (Klein et al., 2006; Richards et al., 2006; Spence et al., 2011; Titov et al., 2011; Wims, Andrews, & Choi, 2010.

Incomplete outcome data (attrition bias). Attrition bias was not a significant issue in 31 of the included studies. These 31 studies used an ITT analysis by either carrying forward last observations or using mixed models analyses to control for outcomes lost to attrition. Moreover, rates of attrition were often quite similar between treatment conditions. Seven studies did not use an ITT approach and as such may be biased due to attrition (Andersson et al., 2009; Frueh et al., 2007b; Hecker et al., 2004; Litz et al., 2007; McNamee et al., 1989; Strachan et al., 2012 Swinson et al., 1995). We investigated the effect of these studies using sensitivity analyses.

Selective reporting (reporting bias). Thirty-six of the included studies reported results for each of the outcomes they measured, as described in their method. Only two studies had a high risk of reporting bias: (1) Frueh et al. (2007b) reported conducting

clinical interviews post-treatment, however, these results are not reported, and (2)
McNamee et al. (1989) collected both self- and observer-report outcomes but only
analyzed observer-report outcomes due to low rates of return of self-report measures.
With respect to the latter, a systematic or treatment-related reason might account for the
low rate of return and so excluding self-report instruments might bias results.

Other potential sources of bias. No other potential sources of bias were
identified in the included studies.

Effects of Interventions

No studies were located that compared therapist-supported distance CBT to (a)
treatment-as-usual or (b) unguided distance interventions that were not CBT, so these two
comparisons are not discussed any further. Similarly, no adverse events/effects were
reported by study authors for any of the included comparisons and so are not listed
below. The remaining comparisons and outcomes are discussed below. We were
successful in collecting complete information from all studies with the exception of one
that reported means and standard deviations for the participant sample as a whole, not
separated by treatment condition (Hecker et al., 2004). This study was not included in
any analyses.

1. Therapist-supported distance CBT versus waiting list control. Twenty-two
studies compared therapist-supported distance CBT with a waiting-list control:
Andersson et al., 2012a; Berger et al., 2009; Carlbring et al., 2001; Carlbring et al., 2006;
Carlbring et al., 2007; Carlbring et al., 2011; Furmark et al., 2009a; Johnston et al., 2011;
Klein et al., 2006; Paxling et al., 2011; Richards et al., 2006; Robinson et al., 2010;
Silfvernagel et al., 2012; Spence et al., 2011; Swinson et al., 1995; Titov, Andrews,

Schwencke, Drobny, & Einstein, 2008a; Titov, Andrews, & Schwencke, 2008b; Titov et al., 2008c; Titov et al., 2009; Titov et al., 2010b; Titov et al., 2011; Wims et al., 2010.

1.1 Remission of anxiety disorder diagnosis. Nine studies assessed diagnostic remission at post-treatment after therapist-supported distance CBT vs. waiting list control. A meta-analysis with 324 treatment participants and 312 controls yielded an OR of 10.94 (95% CI 6.66 to 17.95) in favour of the experimental intervention, with minimal heterogeneity (I^2=7%). These results did not change significantly following sensitivity analyses.

1.2 Reduction in disorder-specific anxiety symptom severity. All 22 studies that compared therapist-supported distance CBT to a waiting list control assessed disorder-specific anxiety symptoms at post-treatment. Taken together, these 22 studies included 754 treatment participants and 723 control participants. Meta-analytic findings showed a significant SMD of -1.26 (95% CI -1.52 to -1.01; see Figure 2.2) in favour of the experimental condition, with significant heterogeneity (I^2=79%). These results did not change significantly following sensitivity analyses. (One study [Titov et al., 2010b] included three separate anxiety disorder subgroups that completed disorder-specific measures so this study was entered as three studies [Titov et al., 2010 GAD, Titov et al., 2010 Panic, and Titov et al. 2010, Social Phobia] in this meta-analysis).

1.3 Reduction in general anxiety symptom severity. Fourteen studies assessed participants' general anxiety after therapist-supported distance CBT (461 treatment participants) vs. waiting list control (447 controls). Data analysis resulted in a SMD of -0.81 (95% CI -1.12 to -0.49) showing a significantly greater decrease in general anxiety

following the experimental intervention, with substantial heterogeneity (I^2=79%). Results were consistent following sensitivity analyses.

1.4 Quality of life. Nineteen studies reported on participants' quality of life following therapist-supported distance CBT (684 treatment participants) vs. waiting list control (662 controls). Analysis resulted in a SMD of 0.51 (95% CI 0.40 to 0.62) in favour of the experimental intervention, with no significant heterogeneity (I^2=0%). No sensitivity analyses were required because of low risk of bias.

1.5 Participant satisfaction with the intervention. A comparison of treatment satisfaction was not warranted, as authors expectedly did not report on the satisfaction of participants on the waiting list. Fourteen studies reported on participants' satisfaction with treatment (two studies reported overall treatment satisfaction across multiple treatment conditions so specific perceptions about the intervention of interest could not be isolated). With the exception of one study (Swinson et al., 1995), these studies included Internet-based treatment with email/phone support. Overall, participants reported a high level of satisfaction with the intervention, with roughly 90% of participants across these studies reporting being very or mostly satisfied with the treatment. Several studies reported that over 90% of participants found the quality of the online treatment modules and their correspondance with a therapist to be excellent or good. Only a few studies mentioned any problems with the intervention; most notably, three studies reported that a majority of participants (70%; Carlbring et al., 2006; Titov et al., 2008a; Titov et al., 2008b) found the treatment moved too quickly.

Subgroup analyses. There was no difference in treatment effect following subgroup analyses of the primary and secondary outcomes with one exception. For the

general anxiety symptoms outcome, a meta-analysis of three studies with 'high' therapist contact (Klein et al., 2006; Richards et al., 2006; Swinson et al., 1995) resulted in a non-significant SMD of -0.58 (95% CI -1.17 to 0.02) with moderate heterogeneity (I^2=52%). Measures of heterogeneity for disorder-specific and general anxiety symptoms were somewhat less amongst the subgroup of studies investigating SP (I^2=0-35%) as compared to the studies investigating PD (I^2=33-89%).

2. Therapist-supported distance CBT versus therapist-supported distance non-CBT interventions. Four studies compared therapist-supported distance CBT with therapist-supported distance non-CBT interventions: Carlbring et al., 2003; Furmark et al., 2009b; Litz et al., 2007; McNamee et al., 1989.

2.1 Remission of anxiety disorder diagnosis. Only one study assessed diagnostic remission at post-treatment after therapist-supported distance CBT (24 treatment participants) vs. therapist-supported distance non-CBT interventions (21 comparator participants). It found that 42.9% of participants receiving therapist-supported distance CBT vs. 5.8% receiving distance-based supportive counselling were below the PTSD diagnostic cut-off; this was a significant difference. At six month follow-up, they found that 50% of the participants completing therapist-supported distance CBT no longer met diagnostic criteria at follow-up, while all of the participants who had completed Internet-based supportive counselling continued to meet diagnostic criteria; this was also a significant difference.

2.2 Reduction in disorder-specific anxiety symptom severity. The four studies that compared therapist-supported distance CBT to therapist-supported distance non-CBT interventions (applied relaxation or supportive counselling) assessed disorder-specific

anxiety symptoms at post-treatment. Combining the outcomes from these four studies included 60 treatment participants and 65 control participants and resulted in a non-significant SMD of -0.06 (95% CI -0.87 to 0.74), with substantial heterogeneity (I^2=76%). At six to 12 month follow-up (43 treatment and 47 comparator participants), a similar non-significant finding emerged (SMD=-0.51, 95% CI -1.76 to 0.74, I^2=83%). A sensitivity analysis conducted with post-treatment data excluding two studies with high ROB (Litz et al., 2007; McNamee et al., 1989) included two studies (Carlbring et al., 2003; Furmark et al., 2009b) with 40 treatment and 40 control participants and resulted in a significant SMD of 0.59 (95% CI 0.15 to 1.04) in favour of the comparator intervention (I^2=0%).

2.3 Reduction in general anxiety symptom severity. Only three studies assessed participants' general anxiety following therapist-supported distance CBT (54 treatment participants) vs. non-CBT interventions (57 comparator participants). Analysis resulted in a non-significant mean difference of -0.81 (95% CI -4.17 to 2.54), with very minimal heterogeneity (I^2=3%). At six to 12 month follow-up (37 treatment and 39 comparator participants), a similar non-significant finding mean difference of -3.81 (95% CI -11.06 to 3.44) emerged, though moderate heterogeneity was reported (I^2=66%). Results remained non-significant following sensitivity analyses.

2.4 Quality of life. Only two studies reported the quality of life of participants completing therapist-supported distance CBT (40 treatment participants) vs. therapist-supported distance non-CBT interventions (40 comparator participants). Meta-analysis revealed a non-significant SMD of -0.25 (95% CI -0.69 to 0.19), with no significant heterogeneity (I^2=0%). At 12 month follow-up, only one study measured participants'

quality of life, reporting a non-significant difference in quality of life between participants in the distance CBT (29 participants) vs. applied relaxation (29 participants) conditions.

2.5 Participant satisfaction with the intervention. None of the studies comparing therapist-supported distance CBT to therapist-supported non-CBT interventions indexed participants' treatment satisfaction.

Subgroup analyses. Subgroup analyses at post-treatment and follow-up were limited by the number of available studies in these comparisons. The subgroup analyses that could be conducted did not show any significant changes in the above findings nor did they lead to significant reductions in heterogeneity.

3. Therapist-supported distance CBT versus unguided distance CBT. Four studies compared therapist-supported distance CBT with unguided distance CBT: Berger et al., 2011; Furmark et al., 2009a; Furmark et al., 2009b; Titov et al., 2008c.

3.1 Remission of anxiety disorder diagnosis. Only Berger et al. (2011) assessed diagnostic remission after therapist-supported distance CBT vs. unguided distance CBT. They reported that 16/27 participants receiving therapist-supported Internet-based CBT and 15/27 participants completing unguided Internet-based CBT no longer met diagnostic criteria post-treatment.

3.2 Reduction in disorder-specific anxiety symptom severity. The four studies that compared therapist-supported distance CBT to unguided distance CBT (i.e., self-help) assessed disorder-specific anxiety symptoms at post-treatment. Combined, these studies included 127 treatment and 126 control participants and resulted in a non-significant SMD of -0.24 (95% CI -0.69 to 0.21), with substantial heterogeneity

(I^2=68%). At six to 12 month follow-up, three studies reported on this outcome; a meta-analysis of 96 treatment and 96 comparator participants resulted in a SMD of -0.30 (95% CI -0.58 to -0.01) in favour of the experimental intervention (I^2=0%). No sensitivity analyses were required.

3.3 Reduction in general anxiety symptom severity. Only two studies assessed participants' general anxiety after therapist-supported distance CBT (69 treatment participants) vs. self-help interventions (69 comparator participants). Data analysis resulted in a non-significant mean difference of 0.28 (95% CI -2.21 to 2.78), with no heterogeneity (I^2=0%). A similar result was found at 12 month follow-up with the same studies; the mean difference was 0.72 (95% CI -2.12 to 3.57), with no heterogeneity (I^2=0%). No sensitivity analyses were required.

3.4 Quality of life. Three studies indexed quality of life of participants following therapist-supported distance CBT (100 treatment participants) vs. unguided distance CBT (99 control participants). Data analysis resulted in a non-significant SMD of 0.07 (95% CI -0.37 to 0.50), with moderate heterogeneity (I^2=58%). At six to 12 month follow-up, only two of these studies indexed quality of life of participants following treatment (69 treatment and 69 comparator participants) with meta-analysis showing a similar non-significant SMD of -0.19 (95% CI -0.53 to 0.14), with no heterogeneity (I^2=0%). No sensitivity analyses were required.

3.5 Participant satisfaction with the intervention. Two studies indexed participant satisfaction with the intervention. Berger et al. (2011) found that treatment satisfaction was significantly higher in the therapist-supported distance CBT condition as compared to the self-help condition according to the Client Satisfaction Questionnaire

(Attkisson & Zwick, 1982). Similarly, Titov et al. (2008c) found a significantly greater number of participants in the therapist-supported distance CBT condition as compared to the self-help condition were very or mostly satisfied with their treatment. However, Titov et al. (2008c) reported no differences between conditions in perceptions of how logical the treatment was, participants' confidence in recommending the treatment to a friend, and the extent to which treatment had increased participants' confidence in managing their symptoms.

Subgroup analyses. Each of the studies included in this comparison investigated the efficacy of Internet-based CBT for SP so few subgroup analyses were warranted. Only one subgroup analysis deviated from the original findings. A meta-analysis of two studies with medium therapist contact (Furmark et al., 2009a; Furmark et al., 2009b) resulted in a non-significant difference in disorder-specific anxiety symptoms (SMD=-0.31, 95% CI -0.65 to -0.03, I^2=3%) at follow-up where the original overall analysis showed a significant difference in favour of the experimental intervention.

4. Therapist-supported distance CBT versus face-to-face CBT. Eleven studies compared therapist-supported distance CBT with face-to-face CBT: Andersson et al., 2009; Bergstrom et al., 2010; Carlbring et al., 2005; Frueh et al., 2007b; Hecker et al., 2004; Hedman et al., 2011; Kiropoulos et al., 2008; Lovell et al., 2006; Morland et al., 2011; Strachan et al., 2012; Tillfors et al., 2008.

4.1 Remission of anxiety disorder diagnosis. Four studies assessed diagnostic remission at post-treatment after therapist-supported distance CBT (185 treatment participants) vs. face-to-face CBT (180 comparator participants). Meta-analysis yielded a non-significant OR of 1.25 (95% CI 0.79 to 1.98), with no heterogeneity (I^2=0%). At six

to 12 month follow-up, the results of three studies that reported on diagnostic remission, with 83 treatment and 74 comparator participants, resulted in a non-significant OR of 1.41 (95% CI 0.84 to 2.38), with no heterogeneity (I^2=0%). No sensitivity analyses were required.

   4.2 Reduction in disorder-specific anxiety symptom severity. The eleven studies that compared therapist-supported distance CBT to face-to-face CBT assessed changes in symptom specific anxiety. One study did not provide separate outcome data by treatment condition (Hecker et al., 2004) and a second study reported only median scores (without ranges) for treatment outcome (Morland et al., 2011); thus, neither study could not be included in this analysis. Using the remaining nine studies, including 266 treatment participants and 264 control participants, meta-analysis resulted in a non-significant SMD of 0.17 (95% CI -0.12 to 0.45; see Figure 2.3), with moderate heterogeneity (I^2=59%). At six to 12 month follow-up, data from six studies including 206 treatment participants and 200 comparator participants, could be used to assess changes in symptom specific anxiety. Meta-analysis resulted in a non-significant SMD of -0.16 (-0.35 to 0.04) with no heterogeneity (I^2=0%). Results remained non-significant following sensitivity analyses.

   4.3 Reduction in general anxiety symptom severity. Seven studies reported participants' levels of general anxiety post-treatment. One study (Hecker et al., 2004), however, did not report outcomes separately by treatment condition and so could not be included in this meta-analysis. The six studies combined in the meta-analysis included 170 treatment participants and 164 comparator participants and resulted in a non-significant SMD of 0.12 (95% CI -0.35 to 0.59) with significant heterogeneity (I^2=75%). When the Kiropoulos et al. (2008) study was removed from the analysis (because it

presented transformed data, which we back-transformed to include in the analysis), the resulting SMD remained non-significant at -0.14 (95% CI -0.38 to 0.11), and heterogeneity was eliminated: I^2=0%. At six to 12 month follow-up, five studies reported participants' level of general anxiety. However, one study (Hecker et al., 2004) did not report outcomes separately by treatment condition. The remaining four studies included 121 treatment participants and 116 comparator participants and yielded a non-significant SMD of -0.16 (95% CI -0.42 to 0.09), with no heterogeneity (I^2=0%).

4.4 Quality of life. Five studies reported on participants' quality of life following therapist-supported distance CBT (198 treatment participants) vs. face-to-face CBT (194 comparator participants). Analysis resulted in a SMD of 0.26 (95% CI 0.06 to 0.45) in favour of the experimental intervention, with no significant heterogeneity (I^2=0%). This trend continued at six to 12 month follow-up. Four studies comprising 158 treatment and 158 comparator participants resulted in a SMD of 0.33 (95% CI 0.11 to 0.55) in favour of the experimental intervention, with no significant heterogeneity (I^2=0%). No sensitivity analyses were required.

4.5 Participant satisfaction with the intervention. Five studies indexed participant satisfaction with the intervention. Overall, treatment satisfaction was high across both therapist-supported distance CBT and face-to-face CBT. Each of the five studies found no significant difference between conditions in participants' overall satisfaction with the intervention or their perceptions of improvement as a result of treatment. One notable significant difference between treatment conditions appeared in two instances. Frueh et al. (2007b) reported that participants receiving therapist-delivered CBT via videoconferencing reported significantly less comfort in talking to their therapist

as compared to participants receiving traditional, face-to-face CBT. Similarly, Kiropoulos et al. (2008) found that participants receiving therapist-supported Internet-based CBT reported significantly less enjoyment in communicating with their therapist as compared to participants receiving face-to-face CBT.

Subgroup analyses. Results for the outcomes diagnostic remission and general anxiety symptoms remained non-significant following subgroup analyses. For the quality of life outcome, when separated by type of anxiety disorder, at follow-up a meta-analysis of two studies investigating PD (Bergstrom et al., 2010; Carlbring et al., 2005) was not significant (SMD=0.28, 95% CI -0.04 to 0.60, I^2=0%) in contrast to the overall meta-analysis which showed superiority of the therapist-supported distance intervention over face-to-face CBT.

For disorder-specific anxiety symptoms outcome, at post-treatment a meta-analysis of the studies investigating PD (Bergstrom et al., 2010; Carlbring et al., 2005; Kiropoulos et al., 2008) found a significant SMD of 0.29 (95% CI 0.03 to 0.54) with no heterogeneity (I^2=0%) in favour of face-to-face CBT. Similarly, at post-treatment a meta-analysis of two studies investigating PTSD (Frueh et al., 2007b; Strachan et al., 2012) revealed a significant SMD of 0.74 (95% CI 0.06 to 1.4) with no heterogeneity (I^2=0%) in favour of face-to-face CBT. In contrast, at post-treatment a meta-analysis of two studies investigating SP (Hedman et al., 2011; Tillfors et al., 2008) remained non-significant (SMD=-0.18, 95% CI -0.92 to 0.5, I^2=76%). Interestingly, at six to 12 month follow-up it was only the meta-analysis of SP studies that showed a significant difference between groups, with an SMD of -0.39 (95% CI -0.71 to -0.08) with no heterogeneity (I^2=0%) in favour of the experimental intervention.

For disorder-specific anxiety symptoms at post-treatment, the meta-analysis of studies investigating Internet-based CBT remained non-significant, however, the meta-analysis of studies investigating videoconferencing (Frueh et al., 2007b; Strachan et al., 2012) revealed a significant SMD of 0.74 (95% CI 0.06 to 1.4) with no heterogeneity (I^2=0%) in favour of face-to-face CBT. At follow-up, the studies investigating Internet-based CBT (Andersson et al., 2009; Bergstrom et al., 2010; Carlbring et al., 2005; Hedman et al., 2011; Tillfors et al., 2008) found a significant SMD of -0.21 (95% CI -0.42 to 0.0) with no heterogeneity (I^2=0%) in favour of the experimental intervention.

A subgroup analysis of studies with high therapist contact for the disorder-specific anxiety symptoms outcome (Frueh et al. 2007b; Kiropoulos et al., 2008; Lovell et al., 2006; Strachan et al., 2012; Tillfors et al., 2008) resulted in a significant SMD of 0.36 (95% CI 0.09 to 0.63) with no heterogeneity (I^2=0%), in favour of face-to-face CBT at post-treatment. The meta-analysis of studies with low therapist (Andersson et al., 2009; Bergstrom et al., 2010; Hedman et al., 2011) contact remained non-significant and there was only one study with medium therapist contact (Carlbring et al., 2005).

Sensitivity analysis. Sensitivity analyses are detailed in the results section above. Given the available studies for this review, some of the planned sensitivity analyses were not warranted. First, as none of the included studies were cluster randomized trials and none of the included studies with multiple intervention arms had selective reporting of intervention comparisons, sensitivity analyses based on these characteristics were not conducted. Second, as we were not required to impute any standard deviations, we also eliminated that planned sensitivity analysis. Finally, as LOCF was the primary method of

ITT analysis reported by authors, we did not exclude studies using LOCF as it would have eliminated 23 studies.

Discussion

Summary of Main Results

Please refer to Table 2.3 and Table 2.4 for a summary of the main results. The present review investigated the efficacy of therapist-supported, distance CBT in treating anxiety disorders in adults. We identified 38 studies to be included in the review, comparing the intervention of interest to a range of comparators including waiting list control, non-CBT therapist-supported distance interventions, unguided distance CBT, and face-to-face group or individual CBT. The majority of included studies investigated the efficacy of Internet-based CBT with therapist support provided by telephone or email, though seven studies investigated the use of telephone therapy or CBT via videoconferencing.

The present findings suggest that therapist-supported distance CBT is more efficacious than a waiting list control in leading to diagnostic remission, reducing anxiety symptoms (both disorder-specific and general), and improving quality of life. Moreover, results suggest that therapist-supported distance CBT may be as effective as face-to-face group and individual CBT in treating anxiety disorders. Meta-analyses revealed no significant differences in diagnostic remission or anxiety symptoms (both disorder-specific and general) at post-treatment or follow-up for these two interventions.

Other comparisons also showed no difference in outcomes following therapist-supported distance CBT vs. non-CBT therapist-supported interventions and following therapist-supported distance CBT vs. unguided distance CBT. Results of meta-analyses at

six to 12 month follow-up generally mirror the findings found at post-treatment. However, these latter comparisons are generally limited by the small number of studies included in each and the degree of variability in the interventions under investigation across studies. Thus, these findings should be interpreted with caution.

Results largely remained robust following sensitivity analyses conducted to explore the impact of potential sources of bias or heterogeneity. Subgroup analyses suggest that there may be some differences in outcome based on the type of anxiety disorder being treated, the type of distance method employed, or the amount of therapist contact; however, the small number of studies within each subgroup generally limits our ability to draw firm conclusions based on these analyses. More research is needed.

Overall Completeness and Applicability of Evidence

Taken together, the studies included in the present review go a long way toward answering the question, is therapist-supported distance CBT an efficacious treatment for anxiety disorders in adults? In particular, the included studies are of sufficient number to comprehensively compare the efficacy of therapist-delivered distance CBT to a waiting list control in reducing anxiety symptoms. The number of included studies investigating the efficacy of the intervention of interest versus traditional face-to-face CBT in reducing anxiety symptoms also warrants a comparison of these two treatment modalities. In comparison, the number of studies comparing therapist-supported distance CBT to other interventions, including unguided distance CBT (i.e., self-help) and therapist-supported distance non-CBT interventions (e.g., relaxation, supportive counselling), is limited. Therefore, our findings with respect to these latter interventions must be interpreted with

caution. There were no studies comparing therapist-supported distance CBT to treatment-as-usual or to unguided distance non-CBT interventions.

The heterogeneity of the interventions included in the studies in this review, in combination with the number of different anxiety disorders that were investigated, must also be considered. While all studies in this review included therapist-supported distance CBT, overwhelmingly studies tended to focus on Internet-based CBT in which treatment is delivered via a series of web pages with interaction with a therapist via telephone or email. Moreover, these studies have largely focused on the treatment of PD and SP, as well as GAD, to some extent. As such, while we can be more confident in our findings as they relate to these particular interventions, they may overshadow nuances in the findings with respect to other forms of distance delivery (e.g., videoconferencing, telephone supported bibliotherapy). Although subgroup analyses based on type of distance delivery were conducted, the limited number of studies in many of these categories prevented meaningful interpretation.

While PTSD has received some research attention, it has largely been focused on the use of videoconferencing. Some researchers have used Internet-based interventions for PTSD. However, these have more often been prevention-focused, rather than treatment-focused, or have used sub-clinical samples, and as such did not qualify for the present review. The nature of the included trials that focused on PTSD somewhat confounds our ability to conduct subgroup analyses as three of the four included PTSD trials employed videoconferencing and 'high' therapist contact; this confuses the picture when attempting to determine the efficacious aspects of these trials. Moreover, these trials each had a very small sample size, amounting to only 51 participants between the

three studies. More work is needed in this area before conclusions as to the efficacy of CBT delivered via videoconferencing for PTSD can be made.

Researchers have previously raised some concerns about the participants included in investigations of distance-based treatments as many of these studies recruit participants from the community via media advertisements (Cuijpers et al., 2009). This is certainly the case with many of the studies included in the present review. There is some question as to whether these participants are similar enough to participants recruited via clinic referrals as is the case with most traditional RCTs of face-to-face CBT. We attempted to account for this by including only participants with an anxiety disorder diagnosed in a standardized manner. Moreover, research by Titov, Andrews, Kemp, and Robinson (2010c) found that participants in a large-scale Internet-based investigation were as severe in terms of symptom severity, distress, and disability as individuals attending a face-to-face clinic and were more severe than individuals identified via an epidemiological survey.

Finally, with respect to the assessment of study outcomes, the inclusion of diagnostic assessment post-treatment is encouraged in future trials in this field. While all studies measured anxiety symptoms via self-report, more objective measures of participants' diagnostic profile will help in determining the clinical significance of treatment outcomes. This review also highlighted the limited number of studies conducting follow-up assessments of participants' symptoms. While the present results do not suggest significant relapse in symptoms after a six month follow-up period, further studies are needed as a maximum of seven studies contributed to this finding across comparisons. Despite the heterogeneity of the interventions and populations across

studies, the robustness of findings following sensitivity analyses lends credence to the

efficacy of distance therapist-delivered CBT as an alternative method of delivering CBT

to those with anxiety disorders who are in need of intervention.

Quality of the Evidence

We considered the quality of the evidence of the included studies using the

GRADE tool (Higgins et al., 2011). With respect to risk of bias, the included evidence is

of moderate quality. The nature of clinical psychotherapy trials is such that keeping the

treatment condition concealed from the participant or the therapist delivering the

treatment is difficult, if not impossible, thus introducing some potential for bias but

nothing that could be improved upon by higher quality study design. Conversely, there

were some difficulties with (a) blinding of outcome assessors, and (b) incomplete

outcome data in several of the included studies. Sensitivity analyses excluding these

studies suggest that any potential bias introduced by these studies did not affect the meta-

analytic outcomes.

There is a large degree of heterogeneity in a number of the meta-analyses in this

review. Such heterogeneity might be expected for two reasons. First, we included studies

of a range of anxiety disorders including PD, SP, GAD, specific phobia, OCD, and

PTSD. It seems possible there are nuances unique to each of these disorders that might

facilitate or hamper the efficacy of their treatment via distance, therapist-delivered CBT.

Second, the nature of the distance interventions included in this review is quite diverse.

Interventions range from Internet-based treatment programs with therapist support by

email or telephone, to programs delivered via telephone with the help of mailed treatment

materials, to treatment delivered entirely by clinicians by way of videoconferencing

technology. Even within these larger subcategories, differences in the amount of therapist contact are substantial. Subgroup analyses might allow us to uncover the effects of such heterogeneity, however, for now there remain too few studies within the different anxiety disorders and/or treatment types to permit very meaningful subgroup analyses. Thus, heterogeneity does remain somewhat of a concern in the present review. Nevertheless, our speculation is that this heterogeneity might be explained by the expected factors discussed here as opposed to any bias in the included studies.

In considering the quality of the evidence, we also examined indirectness of the included studies (i.e., the degree to which the included studies address the review objective) and imprecision of each study's findings. Across included studies, we had no concerns with indirectness. As far as imprecision, some of the included studies are limited by small sample size. The meta-analyses attempt to address such small samples by combining studies where appropriate. Future studies will continue to contribute precision to findings.

Finally, we considered whether publication bias might have affected the evidence. The number of studies within each comparison in the present review did not permit the analysis of many meaningful funnel plots. We did, however, observe a good degree of consistency between trials recorded in clinical trial registries and published manuscripts. We also contacted authors in the field to inquire about any unpublished findings (this did not seem to be a problem). With these factors in mind, we hypothesize that publication bias does not limit the quality of the included evidence. Overall, the included evidence, across studies and comparisons, is of moderate quality. This finding lends confidence to

the present meta-analytic results and conclusions about the efficacy of distance, therapist-delivered CBT for anxiety disorders.

Potential Biases in the Review Process

Given the variability within the field of distance treatment, it is possible that there are several biases inherent in the present review. First, it is important to note that distance-based treatment touches on several different types of interventions including remote communication interventions (Bee et al., 2008), Internet-based or Internet-aided interventions (Andersson, Cuijpers, Carlbring, & Lindefors, 2007; Spek et al., 2007), computer-based or computer aided interventions (Andrews et al., 2010; Cuijpers et al., 2009; Reger & Gahm, 2009), and guided self-help (Cuijpers et al., 2010). Distance treatment borrows components from each of these fields while maintaining a unique identity. While we believe we have accurately defined the parameters of therapist-delivered distance CBT, our definition of the field may have biased the studies included in the review.

Second, we elected to include only those interventions that did not include face-to-face therapist contact during active treatment. This may have excluded studies that were simply conducted within therapists' offices for practical purposes, and only included brief therapist interaction, but could in fact have been feasible from a client's home as well. In this way, the included studies may not comprehensively include all those treatments that could feasibly be conducted via distance. Third, we included only interventions with active therapist involvement. This decision was made because (a) there seems to be an important distinction between guided and unguided treatment, and (b) some prior research has suggested that therapist involvement may be an important part of

distance treatment (Andersson, 2009b; Spek et al., 2007). Nevertheless, this decision impacted the type of trials included in the present review and led to the exclusion of some distance-based studies that did not directly involve therapists but included interactive voice response software (Greist et al., 2002). While preliminary work has been done, further research will need to investigate the importance of active vs. automated vs. no therapist involvement in distance treatment.

Another potential bias in the review process may have been introduced as we elected to include only those studies in which participants were identified as meeting diagnostic criteria for an anxiety disorder as determined by a validated interview or questionnaire. While this is good practice for the empirical validity of the present review, it may not accurately reflect clinical practice in the real-world. It is likely that, as a part of regular clinical practice, clients with sub-clinical diagnoses might be assigned to pursue a distance-based treatment. We might assume that these treatments would be as effective for individuals with sub-clinical symptom patterns as they are for those with diagnosed disorders (Spek et al., 2007); however, our exclusion of these populations prevents any firm statements in this regard.

It is also worth mentioning that given the conceptual and operational overlap between quality of life and disability measures in the anxiety disorder literature (Mogotsi et al., 2000), we included both outcomes within the same meta-analysis. However, given research suggesting that while these concepts are overlapping they are also distinct (Hambrick, Turk, Heimberg, Schneier, & Liebowitz, 2003), it may be that some variability in the impact of treatment on these measures was missed through their

amalgamation. Future studies on distance-based treatment should consider assessing both quality of life and disability as distinct treatment outcomes.

Finally, it is also necessary to note that our method of statistical analysis may have introduced some bias into the results. In combining multiple measures within one study that assessed the same outcome (e.g., combining several measures of panic symptoms into one M and SD), we made use of a method described by Borenstein et al. (2009) that requires the availability of bivariate correlations between the study measures in order for them to be combined. In six studies in the present review, these correlations were not available. In these situations, we simply excluded the measure in question from the overall mean and measure of variance. The general concordance between each of the symptom measures within each study (i.e., a series of symptom measures tended to show similar direction and degree of change from pre- to post-treatment) means that the exclusion of one measure should not significantly impact the results. However, this process may nevertheless have introduced some small degree of bias into the findings.

Agreements and Disagreements with Other Studies or Reviews

Results of this systematic review are in line with findings from several prior reviews. As can be seen from an examination of the present review's included studies, the field of distance treatment is varied and diverse. That said, past meta-analyses have focused on different aspects of distance treatment and included some subgroups of studies that are included in the present review.

Only one meta-analysis has taken a similar approach to ours here and inclusively investigated 'distance, therapist-supported' interventions including treatments that rely on telephone, Internet/email, and/or videoconferencing to administer treatment (Bee et al.,

2008). In line with our findings, their review suggested preliminary evidence for the use of remote therapy to treat anxiety as compared to waitlist control conditions ($d = 1.15$). However, their review excluded many of the studies used in the present review because they included 'minimal therapist contact'.

A number of other meta-analyses have investigated the efficacy of a particular type of distance treatment, specifically Internet-based CBT. These meta-analyses have ranged from a quite broad scope investigating the efficacy of Internet interventions for any health problems ($d = 0.53$; Barak, Hen, Boniel-Nissim, & Shapira, 2008), to a more focused scope investigating the efficacy of Internet CBT for clinical and subclinical anxiety and mood symptoms ($d = 0.96$; Spek et al., 2007) or anxiety and mood disorders in Sweden ($d = 0.91$; Andersson et al., 2007). Taken together, these reviews support the present findings that Internet-based interventions, as one type of distance-based treatment, are efficacious in reducing anxiety symptoms as compared to control interventions (e.g., waiting list control). Within their broad meta-analysis, Barak et al. (2008) found that interventions designed to treat PTSD and those targeting PD showed the largest effect sizes ($g = 0.88$ and 0.80, respectively). Spek et al. (2007) found that those interventions that included therapist contact, as opposed to those that did not, showed a particularly large effect size ($d = 1.00$). It should be noted that some concerns were raised about the methodological quality of the studies included in these types of reviews given their small sample sizes, the absence of details about randomization and treatment allocation methods, and lack of adequate information about treatment compliance and credibility (Postel , de Haan, & De Jong, 2008).

Finally, several meta-analyses have investigated the effects of computer-based psychotherapy for mental health problems, the results of which are also in accordance with the present findings. In a meta-analysis of computer-aided psychotherapy (including treatment delivered via stand-alone or Internet-linked computers, smartphones, palmpilots, interactive voice response, and computer software) for anxiety disorders, Cuijpers et al. (2009) found that computer-aided psychotherapy was more effective than control conditions ($d = 1.08$) in reducing anxiety symptoms and computer-aided psychotherapy outcomes did not differ significantly from those outcomes achieved through face-to-face treatment. Similarly, Reger and Gahm (2009) found medium to large effects sizes when comparing computer- and Internet-based CBT to waiting list, placebo, and/or treatment-as-usual comparators in treating anxiety. When they investigated the effects of therapist involvement on their findings, no significant differences based on amount of therapist contact were identified. Most recently, Andrews et al. (2010) investigated the effects of computer therapy for anxiety and depression (including both computer- and Internet-aided treatments) as compared to control conditions and face-to-face treatment. They found computer-based therapy to be superior to control for the treatment of SP ($g = 0.92$), PD ($g = 0.83$), and GAD ($g = 1.12$). They also found a non-significant difference in outcome between computer-based and face-to-face CBT.

It is important to note that these latter meta-analyses looked more broadly at methods of administering treatment via computer technology, including but not limited to the Internet. Moreover, they included research into non-therapist-supported interventions, interventions administered using interactive voice response, as well as those that included substantial face-to-face contact. They often did not include studies with minimal therapist

guidance or studies that incorporated other forms of distance treatment beyond computer-based interventions (e.g., telephone-based bibliotherapy). Nevertheless, despite the differences between these meta-analyses and our own, the overall body of research serves to add further evidence for the efficacy of distance therapist-delivered CBT in treating anxiety disorders.

Authors' Conclusions

Implications for Practice

The present findings, in consideration of the quality and quantity of the included studies, suggest that therapist-supported distance CBT is an efficacious treatment for many anxiety disorders among adults. Not only do meta-analytic results show that this means of treatment delivery results in significantly better outcomes for adults than a waiting list control, but it also suggests that therapist-supported distance CBT may be as efficacious as face-to-face CBT in treating anxiety. Face-to-face CBT is currently the intervention of choice for the treatment of anxiety disorders (Bisson & Andrew, 2007; Hunot et al., 2007; Norton & Price, 2007; Stewart & Chambless, 2009). In light of the studies included in our review, findings are particularly true for therapist-supported distance treatment that is Internet-based with therapist support via email and/or phone. Fewer studies of other types of distance methods were included in this review so future research may be needed before these other types of distance delivery (e.g., videoconferencing) are incorporated into clinical practice.

Nevertheless, our results, supported by prior meta-analyses (Andrews et al., 2010; Cuijpers et al., 2009) lend credence to researchers' suggestions that distance therapist-supported CBT be more widely incorporated into general clinical practices. The benefit

of distance delivery is in its ability to extend treatment to individuals who may not be able to access treatment through traditional means. It may be that the next step is to uncover the most effective way to make this type of service delivery available to potential clients. For example, it may be possible to administer as an extended service through regular mental health clinics. Alternatively, distance treatment may be more easily administered through clinics devoted entirely to distance treatment. We know of a local example wherein distance treatment for childhood mental health problems is delivered to families via telephone through a unique service offered by the children's hospital (McGrath et al., 2011). Given the present review, it seems timely to incorporate some types of distance treatment into clinical practice; Internet-based programs appear to be efficacious in reducing anxiety symptoms and there are many individuals in need of treatment who could benefit from this type of delivery. The limited number of studies investigating telephone- and videoconferencing-based treatments suggest that they have the potential for extending treatment to those in need, however, further research is needed to confirm their efficacy.

Implications for Research

The present review suggests some important directions for future research. First, while the included studies largely support the use of Internet-based CBT with therapist support via phone and/or email, there are a more limited number of studies into other forms of distance delivery (e.g., videoconferencing). Further research into these types of distance-based treatments are needed. Second, each of the included studies in this review employed various amounts of therapist contact in delivering the distance interventions. Subgroup analyses based on amount of therapist contact did not suggest a difference from

the overall pooled; however, the subgroups were rather small and set somewhat arbitrarily. Future research into the optimal amount of therapist contact would help maximize the efficacy and efficiency with which therapist-delivered distance CBT could be delivered. Finally, as suggested above, future effectiveness studies examining the best way to incorporate distance treatment into regular clinical practice seems to be an important next step in the field.

Table 2.1

Summary of Included Studies Table

| Study | Diagnosis & Comorbidity | Participant Characteristics *(M age, age range, sex, country of residence)* | Co-Use of Medication | N | Intervention | | Control | Outcomes |
					Type & Duration	Therapist Contact		
Andersson et al. (2009)	Specific Phobia, Spider Type\ \ comorbidity not reported	*M* age=25.6 (4.1) 18-65 years 84.8% women Sweden	Not reported	27	IBT with email: 4 wks; 5 online modules	*M* total time spent per participant = 25 min	Orientation and 1 3-hour live exposure session	specific phobia sx; general anxiety sx
Andersson et al. (2012a)	SP\ \ comorbidity included but not reported	ICBT *M* age=38.1 (11.3) WLC *M* age=38.4 (10.9) 19-71 years 61% women Sweden	13.7% using medication	204	ICBT with email: 9 wks; 9 online modules	*M* time spent per participant per week = 15 min	Online Discussion Group	diagnostic status; SP sx; QOL; general anxiety sx;
Berger et al. (2009)	SP\ \ 26.9% comorbid Axis I disorder	*M* age=28.9 (5.3) 19-43 years 44.2% women Switzerland, France, Belgium	Excluded	52	ICBT with email: 10 wks; 5 online modules	*M*=5.5 emails from participant\ \ weekly emails from therapist	WLC	SP sx; treatment satisfaction
Berger et al. (2011)	SP\ \ 38% comorbid Axis I disorder; 12% PD, 10% Specific Phobia, 2% GAD, 22% MDD/Dysthymia, 2% ED	*M* age=37.2 (11.2) 19-62 years 53.1% women Switzerland	7.4% using medication	54	ICBT with email: 10 wks; 5 online modules	*M*=6.16 (*SD*=4.56; range=1-17) emails from participant\ \ *M*=12.44 (*SD*=2.85; range=6-17) emails from therapist	Unguided ICBT\ \ 10 weeks; 5 online modules	diagnostic status; SP sx; treatment satisfaction

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention		Control	Outcomes
					Type & Duration	Therapist Contact		
Bergstrom et al. (2010)	15.4% PD 84.6% PD with Agoraphobia comorbidity not reported	ICBT *M* age=33.8 (9.7) GCBT *M* age=34.6 (9.2) 18 years or older 61.5% women Sweden	45% using medication; 34% SSRI/SNRIs, 13% BZ, 24% BZ derivatives or neuroleptics; 5% TCAs	104	ICBT with email: 10 wks; 10 online modules	*M*=11.3 (*SD*=4.3) emails from therapist *M* total time spent per participant = 35.4 min (*SD*=19)	10 weekly 2-hour sessions of GCBT	diagnostic status; PD sx; QOL
Carlbring et al. (2001)	Panic Disorder comorbidity included but not reported	*M* age=34 (7.5) 21-51 years 71% women Sweden	64% using medication; 44% SSRIs, 10% BZ, 5% TCAs, 5% beta-blockers	41	ICBT with email: 7-12 wks; 6 online modules	*M* reciprocal emails = 7.5 (*SD*=1.2; range=6-15) *M* total time spent per participant = 90 min	WLC	diagnostic status; PD sx; QOL; general anxiety sx; treatment satisfaction
Carlbring et al. (2003)	9.1% PD 90.9% PD with Agoraphobia 39.1% Specific Phobia, 4.3% SP, 13% Mood Disorder	*M* age=38 (8.6) 18-60 years 69% women Sweden	50% SSRIs, 22.7% BZ, 22.7% TCAs, 4.5% beta-blockers	22	ICBT with email: 28 weeks; 6 online modules	*M* total time spent per participant = 30 min	Internet-based applied relaxation with therapist support 28 weeks; 9 online modules	diagnostic status; PD and agoraphobia sx; general anxiety sx; QOL
Carlbring et al. (2005)	49% PD 51% PD with Agoraphobia 49% Anxiety Disorder; 6% MDD	*M* age=35.0 (7.7) 18-60 years old 71% women Sweden	30.6% SSRIs, 8.2% BZ, 6.1% TCAs, 6.1% beta blockers	49	ICBT with email: 10 wks; 10 online modules	*M* reciprocal emails =15.4 (*SD*=5.5; range=4-31) *M* total time spent per participant =150 min	10 weekly 45-60 min sessions of individual CBT	diagnostic status; PD and agoraphobia sx; general anxiety sx; QOL

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention		Control	Outcomes
					Type & Duration	Therapist Contact		
Carlbring et al. (2006)	Panic Disorder comorbidity included but not reported	*M* age=36.7 (10) 18-60 years 60% women Sweden	54% using medication	60	ICBT with email & phone: 10 wks; 10 online modules	*M* reciprocal contacts = 13.5 (*SD* =4.4; range=7-29) *M* time spent per participant per week = 12 min *M* length phone call = 11.8 min (range= 9.6-15.6)	WLC	diagnostic status; PD and agoraphobia sx; general anxiety sx; QOL; treatment satisfaction
Carlbring et al. (2007)	SP comorbidity included but not reported	ICBT *M* age=32.4 (9.1) WLC *M* age=32.9 (9.2) 18-60 years 64.9% women Sweden	Included but not reported	60	ICBT with email & phone: 9 wks; 9 online modules	*M* time spent per participant per week = 22 min *M* length phone call = 10.5 min (*SD*= 3.6)	WLC	SP sx; general anxiety sx; QOL
Carlbring et al. (2011)	9% PD 22% PD with Agoraphobia 39% SP 20% GAD 13% ADNOS 2% OCD, 2% PTSD, 20% MDD, 7% mild depression; 15% Dysthymia	*M* age=38.8 (10.7) 22-63 years 76% women Sweden	26% using an antidepressant or anxiolytic	54	ICBT with email: 10 wks; 6-10 online modules	*M* time spent per participant per week = 15 min	Attention Control 10 wks of posts in an online support forum	diagnostic status; anxiety sx (broadly); QOL; general anxiety sx

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention Type & Duration	Therapist Contact	Control	Outcomes
Frueh et al. (2007b)	<u>Posttraumatic Stress Disorder</u> 74% Anxiety, 84% Mood, 24% Substance Use, & 26% Psychotic Disorders	VCBT *M* age=54.6 (5) GCBT *M* age=55.7 (5.1) 18 years or older 0% women USA	Included but not reported	38	Group VCBT: 14 wks; 14 group sessions	14 90-min group sessions	14 weekly 90-min sessions of GCBT	PTSD sx; treatment satisfaction
Furmark et al. (2009a)	<u>SP</u> comorbidity not reported	ICBT *M* age=35 (10.2) WLC *M* age=35.7 (10.9) Bib *M* age=37.7 (10.3) 18 years or older 67.5% women Sweden	13.9% using medication	120	ICBT with email: 9 wks; 9 online modules	*M* time spent per participant per week = 15 min	(1) Bib: 9 wks; 9 lessons (2) WLC	SP sx; general anxiety sx; QOL
Furmark et al. (2009b)	<u>SP</u> comorbidity not reported	ICBT *M* age=34.9 (8.4) Bib *M* age=32.5 (8.5) Applied Relaxation *M* age=36.4 (9.8) 18 years or older 67.8% women Sweden	6.7% using medication	87	ICBT with email: 9 wks; 9 online modules	*M* time spent per participant per week = 15 min	(1) Bib: 9 wks; 9 lessons (2) Internet-based applied relaxation: 9 wks; 9 online modules	SP sx; general anxiety sx; QOL

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention		Control	Outcomes
					Type & Duration	Therapist Contact		
Hecker et al. (2004)	<u>15% PD</u> <u>85% PD with Agoraphobia</u> 29% GAD, 10% SP, 2% PTSD, 25% Bipolar disorder, 2% Dysthymia, 2% Alcohol Abuse, 2% Trichotil-omania, 2% Bereavement	*M* age=41.31 (10.4) 18 years or older 79% women USA	62.5% using medication	48	Bib with phone: 10 wks; 15 lessons; 4 telephone sessions	30-min introductory session and 3 10-min phone sessions	4 60-90-min GCBT sessions over 10 wks	PD & agoraphobia sx; general anxiety sx
Hedman et al. (2011)	<u>SP</u> 47.5% Anxiety Disorder, 15.1% MDD	ICBT *M* age=35.2 (11.1) GCBT *M* age=35.5 (11.6) 18-64 years 35.7% women Sweden	19.8% SSRIs, 4.8% SNRIs	126	ICBT with email: 15 wks; 15 online modules	*M*=17.4 emails per participant *M* time spent per participant per week = 5.5 min (*SD*=3.6)	15 weekly 2.5-hour sessions of GCBT	diagnostic status; SP sx; QOL; general anxiety sx
Johnston et al. (2011)	<u>20.6% PD with or without Agoraphobia</u> <u>34.4% SP</u> <u>45% GAD</u> 29% Anxiety Disorder, 9.2% Affective Disorder, 32.1% both disorders	*M* age=41.62 (12.83) 19-79 years 58.8% women Australia	29% using medication	139	ICBT with email & phone: 10 wks; 8 online modules	*M*=8.83 (*SD*=3.29) emails per participant *M*=7.54 (*SD*=2.43) phone calls per participant *M* total time spent per participant = 69.09 min (*SD*=32.29)	WLC	disorder-specific sx; general anxiety sx; QOL; treatment satisfaction

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention		Control	Outcomes
					Type & Duration	Therapist Contact		
Kiropoulos et al. (2008)	41.9% PD 58.1% PD with Agoraphobia 72.1% comorbid Mood, Anxiety, Somatoform, or Substance Disorder	*M* age=38.96 (11.13) 20-64 years 72.1% women Australia	47.7% using medication	86	ICBT with email: 6 wks, 6 required & 2 optional online modules	*M*=18.24 (*SD*=9.82) emails from therapist *M*=10.64 (*SD*=8.21) emails from participant *M* total time spent per participant = 352 min (*SD*=240)	12 weekly 1-hour sessions of individual CBT	diagnostic status; PD and agoraphobia sx; general anxiety sx; QOL; treatment satisfaction
Klein et al. (2006)	18% PD 82% PD with Agoraphobia 15% SP, 5% GAD, 20% Specific Phobia, 5% PTSD, 25% MDD, 4% Dysthymia, 2% Bipolar disorder, 13% Hypochon-driasis	*M* age=38.25 (10.6) 18-70 years 80% women Australia	32.7% BZ, 9.1% antidepressants, 10.9% BZ and antidepressants	37	ICBT with email: 6 wks; 6 online modules	*M*=16.39 (*SD*=5.7) emails from therapist *M*=13.06 (*SD*=6.2) emails from participant *M* total time spent per participant = 332.5 min (*SD*=131.8)	Information Control: 6 telephone check-ins over 6 wks	diagnostic status; PD and agoraphobia sx; general anxiety sx; treatment satisfaction
Litz et al. (2007)	PTSD comorbidity included but not reported	ICBT *M* age=38.63 (9.41) Supportive Counseling *M* age=39.86 (7.72) 21-65 years 22.2% women USA	Included but not reported	45	ICBT with email & phone: 8 wks	Not indexed; periodic and ad lib	Internet-based supportive counseling: 8 wks; periodic therapist contact	diagnostic status; PTSD sx; general anxiety sx

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention		Control	Outcomes
					Type & Duration	Therapist Contact		
Lovell et al. (2006)	OCD comorbidity not reported	Telephone CBT *M* age =33.4 (9) Face-to-face CBT *M* age =30.4 (10) 18-65 years 43% women United Kingdom	51.4% using medication	72	Telephone-based CBT: 10 wks; 10 phone sessions	2 1-hour weekly sessions and 8 half-hour weekly sessions	10 weekly 1-hour sessions of individual CBT	OCD sx; treatment satisfaction
McNamee et al. (1989)	Agoraphobia comorbidity excluded	*M* age=45 29-60 years 69.6% women United Kingdom	Included (if no more than 10mg of diazepam or its equivalent) but not reported	23	Telephone-based BT: 12 wks; 10 phone sessions	10 12-min phone sessions	Telephone-based relaxation: 12 wks; 10 12-min phone sessions	agoraphobia sx
Morland et al. (2011)	PTSD comorbidity not reported	VCBT *M* age=53 (19.6) GCBT *M* age=48.6 (14.2) 28-77 years 0% women USA	Included but not reported	13	Group VCBT: 6 wks; 12 group sessions	12 90-min group sessions	12 weekly 90-min sessions of GCBT	PTSD sx; treatment satisfaction
Paxling et al. (2012)	GAD comorbidity included but not fully reported; 22.5% MDD	*M* age=39.3 (10.8) 18-66 years 79.8% women Sweden	37.1% using medication	89	ICBT with email: 8 wks; 8 online modules	*M* total time spent per participant = 97 min (*SD*=52)	WLC	GAD sx; general anxiety sx; QOL

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention Type & Duration	Therapist Contact	Control	Outcomes
Richards et al. (2006)	21.9% PD 78.1% PD with Agoraphobia 22% SP, 13% GAD, 9% Specific Phobia, 6% PTSD, 9% MDD, 6% Hypo-chondriasis, 3% Somatization	*M* age=36.59 (9.9) 18-70 years 68.8% women Australia	15.6% anti-depressants, 12.5% BZ, 9.4% antidepressants and BZ	21	ICBT with email: 8 wks, 6 online modules	*M*=18 (*SD*=6.5) emails from therapist *M*=15.3 (*SD*=12.8) emails from participant *M* total time spent per participant =376.3 min (*SD*=156.8)	Information Only Control Weekly status updates to clinician and access to online non-CBT info	diagnostic status; PD and agoraphobia sx; general anxiety sx; QOL
Robinson et al. (2010)	GAD comorbidity included but not reported	*M* age=46.96 (12.7) 18-80 years 68.3% women Australia	Included but not reported	100	ICBT with email and phone: 10 wks; 6 online modules	*M* =33.2 (*SD*=4) emails/calls per participant *M* total time spent per participant = 80.8 min (*SD*=22.6)	WLC	diagnostic status; GAD sx; QOL; treatment satisfaction
Silfvernagel et al. (2012)	7% PD 83% PD with Agoraphobia 16% SP 19% GAD 2% ADNOS 32% comorbid disorder	*M* age=32.4 (6.9) 20-45 years 65% women Sweden	47% using medication	57	ICBT with email: 8 wks; 6-8 online modules	*M* time spent per participant = 15 min/week	WLC	diagnostic status; PD sx; general anxiety sx; QOL

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention Type & Duration	Therapist Contact	Control	Outcomes
Spence et al. (2011)	PTSD 62% MDD, 33% SP, 31% PD with or without Agoraphobia, 26% GAD; 17% OCD	*M* age=42.6 (13.1) 21-68 years 81% women Australia	60% using medication	44	ICBT with email & phone: 8 wks; 7 online modules	*M*=5.39 (*SD*=3.54) emails per participant *M*=7.87 (*SD*=2.56) phone calls per participant *M* total time spent per participant = 103.91 min (*SD*=96.53)	WLC	diagnostic remission; PTSD sx; QOL; general anxiety sx; treatment satisfaction
Strachan et al. (2011)	PTSD 22.5% MDD	*M* age=30.4 (7.6) 18 years or older 7.5% women USA	Included but not reported	20	Group VCBT: 8 wks; 8 group sessions	8 90-min group sessions	8 weekly 90-min sessions of GCBT	PTSD sx; general anxiety sx
Swinson et al. (1995)	PD with Agoraphobia comorbidity included but not reported	*M* age=40.5 (10.81) 18-65 years 88.1% women Canada	83% using medication, of whom 94% using BZ	46	Telephone-based BT: 10 wks; 8 phone sessions	8 60-min phone sessions	WLC	PD & agoraphobia sx; general anxiety sx; treatment satisfaction
Tillfors et al. (2008)	SP comorbidity included but not reported	ICBT *M* age=32.3 (9.7) ICBT+exposure *M* age= 30.4 (6.3) 19-53 years 78.9% women Sweden	Included but not reported	38	ICBT with email: 9 wks; 9 online modules	*M*=35 min per participant per week	ICBT with email (9 online modules) + 5 live 2.25-hour exposure sessions; 9 wks	SP sx; general anxiety sx; QOL; treatment satisfaction
Titov et al. (2008a)	SP comorbidity included but not reported	*M* age=38.13 (12.24) 18-72 years 59% women Australia	29% using medication	105	ICBT with email: 10 wks; 6 online modules	*M* total time spent per participant = 125 min (*SD*=25)	WLC	SP sx; QOL; treatment satisfaction

Study	Diagnosis & Comorbidity	Participant Characteristics *(M age, age range, sex, country of residence)*	Co-Use of Medication	N	Intervention		Control	Outcomes
					Type & Duration	Therapist Contact		
Titov et al. (2008b)	SP comorbidity included but not reported	*M* age=36.79 (10.93) 20-61 years 62.96% women Australia	25.9% using medication	88	ICBT with email: 10 wks; 6 online modules	*M* total time spent per participant = 126.76 min (*SD*=30.89)	WLC	SP sx; QOL; treatment satisfaction
Titov et al. (2008c)	SP comorbidity included but not reported	*M* age=37.97 (11.29) 18-64 years 61.05% women Australia	25.9% using medication	98	ICBT with email: 10 wks; 6 online modules	*M* total time spent per participant = 168 min (*SD*=40)	(1) Unguided ICBT 10 wks; 6 online modules (2) WLC	SP sx; QOL; treatment satisfaction
Titov et al. (2009)	GAD comorbidity included but not reported	*M* age=44 (12.98) 18 years or older 76% women Australia	29% using medication	48	ICBT with email & phone: 9 wks, 6 online modules	*M* =23.7 emails, 5.5 instant messages, and 4.1 calls per participant *M* total time spent per participant = 130 min	WLC	diagnostic status; GAD sx; QOL; treatment satisfaction
Titov et al. (2010b)	26.9% PD with Agoraphobia 29.5% SP 43.6% GAD 28.2% Anxiety Disorder, 20.5% Affective Disorder, 26.9% both disorders	*M* age=39.5 (13) 18 years or older 67.9% women Australia	47.4% using medication	86	ICBT with email & phone: 8 wks; 6 online modules	*M* =23.6 emails from therapist *M* total time spent per participant = 46 min (*SD*=16)	WLC	diagnostic status; disorder-specific anxiety sx; QOL; treatment satisfaction

Study	Diagnosis & Comorbidity	Participant Characteristics (*M age, age range, sex, country of residence*)	Co-Use of Medication	N	Intervention Type & Duration	Therapist Contact	Control	Outcomes
Titov et al. (2011)	10% PD with or without Agoraphobia 11% SP 28% GAD 51% MDD 81% had a comorbidity	*M* age=43.9 (14.6) 18-79 years 73% women Australia	54% using medication	74	ICBT with email & phone: 10 wks; 8 online modules	*M*=5.45 (*SD*=3.57) emails per participant *M*=9.35 (*SD*=2.96) phone calls per participant *M* total time spent per participant = 84.76 min (*SD*=50.37)	WLC	disorder-specific sx; general anxiety sx; QOL; treatment satisfaction
Wims et al. (2010)	PD with or without Agoraphobia 21% SP, 31% GAD, 10% OCD, 7% PTSD, 21% MDD	*M* age=42.08 (12.29) 18 years or older 76% women Australia	31% using medication	59	ICBT with email: 8 wks; 6 online modules	*M* =7.5emails from therapist *M* total time spent per participant = 75 min	WLC	diagnostic status; PD & agoraphobia sx; QOL

Notes: All data in the above table represent only that included in/relevant to the present review. ADNOS = anxiety disorder, not otherwise specified; Bib = Bibliotherapy; BZ = benzodiazepine; ED = eating disorder; GAD = generalized anxiety disorder; GCBT = group cognitive behavioural therapy; IBT = internet-based behavioural therapy; ICBT = internet-based cognitive behavioural therapy; MDD = major depressive disorder; OCD = obsessive compulsive disorder; PD = panic disorder; PTSD = posttraumatic stress disorder; QOL = quality of life; SNRI = serotonin-norepinephrine re-uptake inhibitor; SP = social phobia; SSRI = selective serotonin re-uptake inhibitor; sx = symptoms; TCA = tricyclic antidepressant; VCBT = videoconferencing cognitive-behavioural therapy; WLC = waiting list control.

Table 2.2

Risk of Bias of Included Studies

	Random Sequence Generation	Allocation Concealment	Blinding of Participants and Personnel	Blinding of Outcome Assessment: Self-Report	Blinding of Outcome Assessment: Observer	Incomplete Outcome Data	Selective Reporting
Andersson et al. (2009)	?	?	-	-	n/a	-	+
Andersson et al. (2012a)	+	?	-	-	+	+	+
Berger et al. (2009)	+	?	-	-	n/a	+	+
Berger et al. (2011)	+	+	-	-	-	+	+
Bergstrom et al. (2010)	+	+	-	+	+	+	+
Carlbring et al. (2001)	+	+	-	-	n/a	+	+
Carlbring et al. (2003)	+	?	-	-	n/a	+	+
Carlbring et al. (2005)	+	?	-	-	+	+	+
Carlbring et al. (2006)	+	?	-	-	+	+	+
Carlbring et al. (2007)	+	?	-	-	n/a	+	+
Carlbring et al. (2011)	+	?	-	-	+	+	+
Frueh et al. (2007b)	+	?	-	-	n/a	-	-
Furmark et al. (2009a)	+	?	-	-	n/a	+	+
Furmark et al. (2009b)	+	?	-	-	n/a	+	+
Hecker et al. (2004)	?	?	-	-	?	-	+
Hedman et al. (2011)	+	+	-	-	+	+	+
Johnston et al. (2011)	+	+	-	-	n/a	+	+
Kiropoulos et al. (2008)	+	?	-	-	+	+	+
Klein et al. (2006)	-	?	-	-	-	+	+
Litz et al. (2007)	?	?	-	-	+	-	+
Lovell et al. (2006)	+	+	-	+	+	+	+
McNamee et al. (1989)	?	?	-	n/a	+	-	-
Morland et al. (2011)	+	?	-	+	+	+	+
Paxling et al. (2011)	+	?	-	-	+	+	+

	Random Sequence Generation	Allocation Concealment	Blinding of Participants and Personnel	Blinding of Outcome Assessment: Self-Report	Blinding of Outcome Assessment: Observer	Incomplete Outcome Data	Selective Reporting
Richards et al. (2006)	?	?	-	-	-	+	+
Robinson et al. (2010)	+	?	-	-	n/a	+	+
Silfvernagel et al. (2012)	+	?	-	-	+	+	+
Spence et al. (2011)	+	?	-	-	-	+	+
Strachan et al. (2012)	+	?	-	n/a	+	-	+
Swinson et al. (1995)	+	+	-	-	n/a	-	+
Tillfors et al. (2008)	?	?	-	-	n/a	+	+
Titov et al. (2008a)	+	?	-	-	n/a	+	+
Titov et al. (2008b)	+	?	-	-	n/a	+	+
Titov et al. (2008c)	+	?	-	-	n/a	+	+
Titov et al. (2009)	+	?	-	-	n/a	+	+
Titov et al. (2010b)	+	?	-	-	n/a	+	+
Titov et al. (2011)	+	?	-	-	-	+	+
Wims et al. (2010)	+	?	-	-	-	+	+

Note. + = low risk of bias; - = high risk of bias; ? = unclear/unknown risk of bias; n/a = not applicable.

Table 2.3

Summary of Findings Table: Therapist-Supported Distance CBT Compared to Waiting List Control for Anxiety Disorders in Adults

Therapist-delivered distance CBT compared to waiting list control for anxiety disorders in adults

Patient or population: patients with anxiety disorders
Settings: outpatient care via telephone, Internet/email, and/or videoconferencing
Intervention: therapist-delivered distance CBT
Comparison: waiting list control

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Waiting list control	Therapist-delivered distance CBT				
Diagnostic Remission at Post-Treatment Indexed by a standardized interview or clinically accepted measure cut-off score	**Study population**		10.07 (6.51 to 15.57)	731 (11 studies)	⊕⊕⊕⊖ **moderate**[1]	
	12 per 100	100 per 100 (77 to 100)				
	Moderate					
	7 per 100	75 per 100 (48 to 100)				
Disorder-Specific Anxiety Symptom Severity at Post-Treatment Indexed by a range of disorder-specific self-report measures		The mean disorder-specific anxiety symptom severity at post-treatment in the intervention groups was **1.26 standard deviations lower** (1.53 to 0.99 lower)		1420 (23 studies)	⊕⊕⊕⊖ **moderate**[2,3]	A standard deviation of 0.80 or greater represents a large difference between groups.[4]
General Anxiety Symptom Severity at Post-Treatment Indexed by a range of measures of anxiety symptoms in general		The mean general anxiety symptom severity at post-treatment in the intervention groups was **0.83 standard deviations lower** (1.16 to 0.49 lower)		851 (13 studies)	⊕⊕⊕⊖ **moderate**[3]	A standard deviation of 0.80 represents a large difference between groups.[4]
Adverse Events at Post-Treatment - not measured	See comment	See comment	Not estimable	-	See comment	No adverse events were reported for participants in the experimental or control conditions across all studies.
Quality of Life at Post-Treatment Indexed by self-report measures of quality of life or functional disability		The mean quality of life at post-treatment in the intervention groups was **0.51 standard deviations higher** (0.39 to 0.62 higher)		1289 (18 studies)	⊕⊕⊕⊕ **high**	A standard deviation of 0.5 represents a moderate difference between groups.[4]

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Downgraded primarily because four of the included studies did not blind their outcome assessors to participants' group assignment.
[2] While participants in the included studies were not blind to their treatment condition when completing self-report measures and therapists were not blind to the treatment they were delivering, these study characteristics cannot be avoided in this type of clinical treatment.
[3] The heterogeneity amongst the included studies was quite high. This may be explained by the variety of anxiety disorders investigated and differences in the treatment details; however, the number of studies that could be included in subgroup analyses was not sufficient to provide useful reasons for this heterogeneity.
[4] According to Cohen's (1969) interpretation of effect sizes.

Table 2.4

Summary of Findings Table: Therapist-Supported Distance CBT Compared to Face-to-Face CBT for Anxiety Disorders in Adults

Therapist-delivered distance CBT compared to face-to-face CBT for anxiety disorders

Patient or population: patients with anxiety disorders
Settings: outpatient care via telephone, Internet/email, and/or videoconferencing
Intervention: therapist-delivered distance CBT
Comparison: face-to-face CBT

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk Face-to-face CBT	Corresponding risk Therapist-delivered distance CBT				
Diagnostic Remission at Post-Treatment Indexed by a standardized interview or clinically accepted measure cut-off score	**Study population**		OR 1.25 (0.79 to 1.98)	365 (4 studies)	⊕⊕⊕⊖ **moderate**[1]	
	41 per 100	**46 per 100** (35 to 57)				
	Moderate					
	45 per 100	**51 per 100** (39 to 62)				
Disorder-Specific Anxiety Symptom Severity at Post-Treatment Indexed by a range of disorder-specific self-report measures		The mean disorder-specific anxiety symptom severity at post-treatment in the intervention groups was **0.17 standard deviations higher** (0.12 lower to 0.45 higher)		530 (9 studies)	⊕⊕⊕⊖ **moderate**[1]	There was no significant difference between groups.
General Anxiety Symptom Severity at Post-Treatment Indexed by a range of measures of anxiety symptoms in general		The mean general anxiety symptom severity at post-treatment in the intervention groups was **0.12 standard deviations higher** (0.35 lower to 0.59 higher)		334 (6 studies)	⊕⊕⊕⊖ **moderate**[1]	There was no significant difference between groups.
Adverse Events at Post-Treatment - not measured	See comment	See comment	Not estimable	-	See comment	No adverse events were reported for participants in the experimental or control conditions across all studies.
Quality of Life at Post-Treatment Indexed by self-report measures of quality of life or functional disability		The mean quality of life at post-treatment in the intervention groups was **0.26 standard deviations higher** (0.06 to 0.45 higher)		392 (5 studies)	⊕⊕⊕⊕ **high**	A standard deviation of 0.20 represents a small difference between groups.[2]
Participant Satisfaction indexed by a mix of qualitative and	See comment	See comment	Not estimable	0 (5 studies)	See comment	Studies reported high overall treatment satisfaction across both conditions.

| quantitative self-report measures | | |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **OR:** Odds ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Downgraded primarily because several included studies provided incomplete outcome data (though sensitivity analyses suggest no difference in findings when these studies are excluded).
[2] According to Cohen's (1969) interpretation of effect sizes.

SEARCH PROCESS 1: CCDAN registers
a) CCDAN Studies = 93 studies (192 refs)
b) CCDAN References = 517 refs
  (Unique records)

SEARCH PROCESS 2: Other databases

Clinicaltrials.gov = 827
WHO International Clinical Trials Registry = 552

SEARCH PROCESS 3: Additional resources
a) Reference Screening = 43
b) Personal Communication = 17
  (Unique records)

SCREENING: no. of records screened after de-duplication
1a = 190
1b = 499
2 = 748
3 = 31

Records excluded:
Population = 855
Intervention = 341
Comparator = 22
Methods = 24

ELIGIBILITY: no. of full-text articles assessed
1a = 62
1b = 99
2 = 45
3 = 10

Records excluded:
Population = 30
Intervention = 54
Comparator = 22
Methods = 19
Ongoing = 20

INCLUDED STUDIES: no. of studies included in qualitative analysis
1a = 12 studies
1b = 25 studies
2 = 1 study
3 = 0 studies

Comparison 1:
vs. Waiting list
22 studies
(1477 participants)

Comparison 2:
vs. Therapist-supported distance non-CBT
4 studies
(125 participants)

Comparison 3:
vs. Unguided distance CBT
4 studies
(199 participants)

Comparison 4:
vs. Face-to-face CBT
9 studies
(530 participants)

Figure 2.1. PRISMA diagram of study selection.

Study or Subgroup	Distance CBT Mean	SD	Total	Waiting List Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Andersson 2012	29.94	8.27	102	42.38	8.05	102	5.1%	-1.52 [-1.83, -1.21]
Berger 2009	36.77	8.9	31	48.33	7.08	21	4.2%	-1.39 [-2.00, -0.77]
Carlbring 2001	33.86	4.63	21	45.43	5.96	20	3.7%	-2.13 [-2.91, -1.35]
Carlbring 2006	13.83	1.65	30	21.98	2.05	30	3.2%	-4.32 [-5.27, -3.38]
Carlbring 2007	22.58	6.03	29	37.08	6.52	28	4.0%	-2.28 [-2.96, -1.60]
Carlbring 2011	0.99	0.58	27	1.48	0.4	27	4.4%	-0.97 [-1.54, -0.40]
Furmark 2009a	34.43	7.15	40	45.54	9.46	40	4.6%	-1.31 [-1.80, -0.83]
Johnston 2011	7.54	5.7	46	11.79	4.6	42	4.8%	-0.81 [-1.25, -0.37]
Klein 2006	8.96	5.48	19	19.5	5.36	18	3.6%	-1.90 [-2.69, -1.11]
Paxling 2011	32.14	6.41	44	39.6	3.92	45	4.7%	-1.40 [-1.86, -0.93]
Richards 2006	13.53	5.48	12	17.5	3.59	9	3.3%	-0.80 [-1.70, 0.11]
Robinson 2010	51.45	12.28	47	64.22	11.81	48	4.8%	-1.05 [-1.48, -0.62]
Silfvernagel 2012	6.54	4.97	29	13.81	5.49	28	4.3%	-1.37 [-1.95, -0.79]
Spence 2011	44.78	17.29	23	51.79	12.51	19	4.2%	-0.45 [-1.06, 0.17]
Swinson 1995	20.68	5.68	20	31.37	4.75	22	3.8%	-2.01 [-2.77, -1.26]
Titov 2008a	29.94	9.05	50	42.46	11.54	49	4.8%	-1.20 [-1.63, -0.77]
Titov 2008b	29.01	11.54	41	44.79	10.17	40	4.6%	-1.44 [-1.93, -0.94]
Titov 2008c	29.76	8.02	31	44.25	13.56	34	4.5%	-1.27 [-1.81, -0.73]
Titov 2009	56.75	10.78	24	66.14	8.7	21	4.2%	-0.93 [-1.55, -0.32]
Titov 2010 GAD	60.94	9.4	18	61.94	11.16	16	4.0%	-0.10 [-0.77, 0.58]
Titov 2010 Panic	7.7	3.97	10	15	6.72	11	3.1%	-1.25 [-2.21, -0.30]
Titov 2010 Social Phobia	13.25	10.69	12	18.36	11.91	11	3.5%	-0.44 [-1.27, 0.39]
Titov 2011	7.63	5.3	19	8.88	4.11	17	4.1%	-0.26 [-0.91, 0.40]
Wims 2010	41.6	6.3	29	45.1	6.15	25	4.4%	-0.55 [-1.10, -0.01]
Total (95% CI)			754			723	100.0%	**-1.26 [-1.52, -1.01]**

Heterogeneity: Tau² = 0.31; Chi² = 109.04, df = 23 (P < 0.00001); I² = 79%
Test for overall effect: Z = 9.63 (P < 0.00001)

Favours Distance CBT   Favours Waiting List

Figure 2.2. Forest plot: Therapist-supported distance CBT versus waiting list control for anxiety symptom severity at post-treatment.

Study or Subgroup	Distance CBT Mean	SD	Total	Face-to-Face CBT Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Andersson 2009	10.7	6.8	13	10.1	5.6	14	8.5%	0.09 [-0.66, 0.85]
Bergstrom 2010	12.2	5.48	50	10.9	5.17	54	15.0%	0.24 [-0.14, 0.63]
Carlbring 2005	14.68	1.99	25	14.58	1.67	24	11.5%	0.05 [-0.51, 0.61]
Frueh 2007	68.11	11	9	56.58	10.1	12	6.5%	1.06 [0.12, 1.99]
Hedman 2011	27.93	6.66	64	31.68	7.94	62	15.6%	-0.51 [-0.86, -0.15]
Kiropoulos 2008	11.46	4.07	44	9.4	4.27	37	13.8%	0.49 [0.05, 0.93]
Lovell 2006	14	6.9	35	13.4	7.7	33	13.1%	0.08 [-0.39, 0.56]
Strachan 2012	53.86	24.88	7	46.2	12.85	10	6.1%	0.39 [-0.59, 1.37]
Tillfors 2008	25.7	6.27	19	24	6.69	18	10.0%	0.26 [-0.39, 0.90]
Total (95% CI)			266			264	100.0%	0.17 [-0.12, 0.45]

Heterogeneity: Tau² = 0.10; Chi² = 19.41, df = 8 (P = 0.01); I² = 59%
Test for overall effect: Z = 1.14 (P = 0.25)

Std. Mean Difference
IV, Random, 95% CI

-4 -2 0 2 4
Favours Distance CBT   Favours Face-to-Face CBT

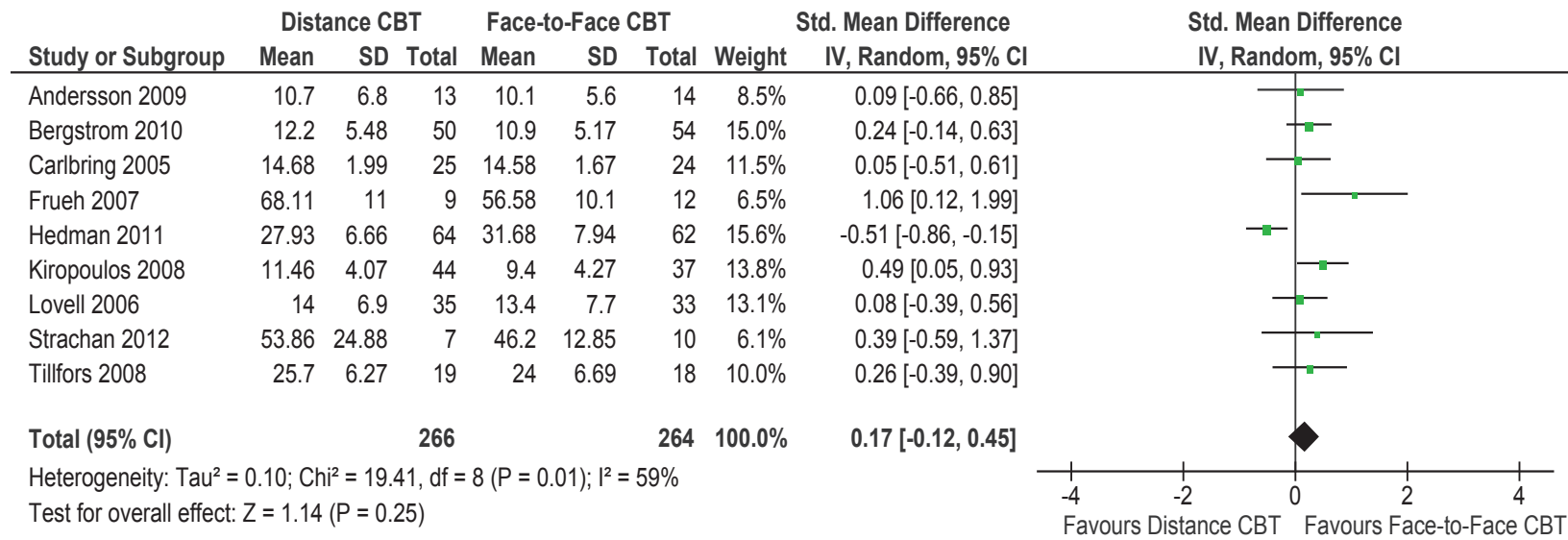*Figure 2.3.* Forest plot: Therapist-supported distance CBT versus face-to-face CBT for anxiety symptom severity at post-treatment.

CHAPTER 3. PROLOGUE TO STUDY 2

The results of Study 1 showed that delivering treatment for anxiety to participants using a remote communication technology in place of face-to-face sessions can successfully reduce anxiety symptoms. The series of meta-analyses conducted in Study 1 suggest that distance cognitive behaviour therapy (CBT) is (a) more efficacious than a waiting list control and (b) as successful as face-to-face CBT in treating anxiety. Taken together, the findings suggest that distance treatment is a promising method of overcoming a number of the barriers to treatment at the individual level, including both practical barriers, such as difficulties accessing transportation to treatment, and emotional barriers, such as worries about stigma associated with mental health care (Collins, Westra, Dozois, & Burns, 2011).

The next study, Study 2, shifts the focus from addressing barriers to treatment at the individual level to addressing barriers to treatment at the treatment efficacy level. Despite the existence of empirically validated treatments for anxiety, these treatments are not effective for all clients, all of the time (Dugas et al., 2010; DiMauro, Dominigues, Fernandez, & Tolin, 2013). One factor that might complicate the efficacy of treatment is the role of comorbid conditions (Olatunji, Cisler, & Tolin, 2010a). Recently, researchers have considered a new approach to treating comorbidities by treating shared underlying risk factors or core processes of the comorbid conditions (e.g., neuroticism), rather than treating the disorder-specific symptoms themselves (Barlow, Allen, & Choate, 2004). These interventions are often referred to as 'transdiagnostic' interventions.

The goal of Study 2 was to investigate the suitability of anxiety sensitivity (AS), a fear of arousal-related physiological sensations, as a target of transdiagnostic treatment.

More specifically, Study 2 explores the associations of AS with a range of different emotional disorder symptoms, including panic, social phobia, generalized anxiety, posttraumatic stress, and depressive symptoms. Because AS is composed of three lower-order factors (Taylor, 1999), Study 2 also looked at the unique relations of these lower-order factors with specific emotional disorder symptoms. Prior research has highlighted a number of important connections between AS and mood and anxiety disorders (Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009); however, Study 2 adds to this literature by using the Anxiety Sensitivity Index – 3 (Reiss, Peterson, Taylor, Schmidt, & Weems, 2008) to measure AS. As compared to previous versions of this measure, the psychometric properties are improved (Taylor et al., 2007) allowing for a more valid exploration of the relations between the lower-order factors of AS and mood and anxiety disorders. Findings from Study 2 could inform us to whether reducing AS might have transdiagnostic implications.

CHAPTER 4. STUDY 2: ANXIETY SENSITIVITY INDEX (ASI-3) SUBSCALES PREDICT UNIQUE VARIANCE IN ANXIETY AND DEPRESSIVE SYMPTOMS[2]

Abstract

Anxiety sensitivity (AS) has been implicated in the development and maintenance of a range of mental health problems. The development of the Anxiety Sensitivity Index – 3, a psychometrically sound index of AS, has provided the opportunity to better understand how the lower-order factors of AS – physical, psychological, and social concerns – are associated with unique forms of psychopathology. The present study investigated these associations among 85 treatment-seeking adults with high AS. Participants completed measures of AS, anxiety, and depression. Multiple regression analyses controlling for other emotional disorder symptoms revealed unique associations between AS subscales and certain types of psychopathology. Only physical concerns predicted unique variance in panic, only cognitive concerns predicted unique variance in depressive symptoms, and social anxiety was predicted by only social concerns. Findings emphasize the importance of considering the multidimensional nature of AS in understanding its role in anxiety and depression and their treatment.

Introduction

Anxiety sensitivity (AS) is an important individual difference factor that has received research attention for its role in the development and maintenance of mental health problems (e.g., Calkins et al., 2009; Schmidt, Mitchell, & Richey, 2008; for

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[2] This article is adapted from 'Olthuis, J. V., Watt, M. C., & Stewart, S. H. (in press). Anxiety Sensitivity Index (ASI-3) subscales predict unique variance in anxiety and depressive symptoms, *Journal of Anxiety Disorders*' with permission from Elsevier (see Appendix C). As first author of this article, I designed the study, organized and managed participant recruitment, collected data including conducting standardized assessments, conducted the data analyses, wrote the manuscript and revised the manuscript in accordance with suggestions from my co-authors, the peer reviewers, and the journal editor.

reviews, see Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009). More specifically, AS is an enduring fear of arousal-related sensations that arises from the tendency to interpret these sensations catastrophically, believing that they will have serious physical, psychological, or social consequences (Reiss, 1991; Reiss & McNally, 1985). For example, an individual with high AS who experiences a racing heart might fear this sensation portends a heart attack. In contrast, individuals with low AS regard these sensations as unpleasant but harmless (McNally, 1999).

Psychometric studies largely support the idea that AS, as measured by the Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992), constitutes a global construct composed of several lower-order factors detailing fear of specific anxiety symptoms and associated catastrophic consequences. The most consistent factor solution to the ASI includes three lower-order factors: physical concerns, cognitive concerns, and social concerns (Taylor, 1999). High scores on the physical concerns factor denote worry about the physical health consequences of arousal sensations (e.g., heart palpitations leading to a heart attack). High cognitive concerns are associated with worries that psychological symptoms, such as concentration difficulties, might lead to cognitive consequences such as mental incapacitation. Finally, high social concerns result from thoughts that publicly-observable anxiety symptoms might lead to social censure or rejection. These lower-order factors are important as they may reflect unique mechanisms through which AS acts as a vulnerability factor for specific mental health symptoms.

Clark's cognitive theory of panic (1986) provides one useful model for understanding the role of AS in the development and maintenance of mental health problems. Clark suggested that when an individual interprets an otherwise benign

arousal-related sensation catastrophically, in the manner of those with high AS, his/her perception of threat is enhanced, leading to increased severity of arousal symptoms and ultimately some type of maladaptive behaviour (e.g., panic attack, avoidance). In accordance, research has widely shown high levels of AS among those with panic disorder (PD: e.g., Taylor, Koch, McNally, & Crockett, 1992). Longitudinal studies show that high AS predicts the development of panic attacks (Maller & Reiss, 1992; Schmidt, Lerew, & Jackson, 1997, 1999; Schmidt et al., 2008) and has a pathoplastic relation with panic (Schmidt & Bates, 2003). Consistent with its theoretical role in motivating avoidance, AS is positively associated with agoraphobia symptoms (White, Brown, Somers, & Barlow, 2006).

Research suggests that physical, as compared to social or cognitive, concerns are most closely associated with PD (Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004) and that individuals with PD have higher AS physical concerns than those with other anxiety disorders or a community sample (Carleton, Abrams, Asmundson, Antony, & McCabe, 2009; Rector, Szacun-Shimizu, & Leybman, 2007; Zinbarg, Barlow, & Brown, 1997). Similarly, studies have shown that physical concerns are the most predictive of fearful responding to CO_2 challenge, a panic-related phenomena (Brown, Smits, Powers, & Telch, 2003; Carter, Suchday, & Gore, 2001; Zinbarg, Brown, Barlow, & Rapee, 2001; Zvolensky, Feldner, Eifert, & Stewart, 2001). In addition, longitudinal studies have found AS physical concerns to predict panic-relevant symptoms (Grant, Beck, & Davila, 2007), behavioural avoidance (among adolescents; Wilson & Hayward, 2006), and the clinical course of PD (Benitez et al., 2009). In fact, newer models of PD posit the AS physical

concerns factor, as opposed to global AS, as an active panicogenic factor (Pilecki, Arentoft, & McKay, 2011).

Beyond PD, high levels of AS have also been associated with social phobia (SP; e.g., Ball, Otto, Pollack, Uccello, & Rosenbaum, 1995; Norton, Cox, Hewitt, & McLeod, 1997). This is likely due to the fear of negative evaluation resulting from a display of observable anxiety symptoms (Cox, Borger, & Enns, 1999). Research has also shown that lower AS levels predict recovery from SP (Vriends et al., 2007). Of the AS subscales, social concerns has consistently been most closely linked with social anxiety. A number of studies have found that high social concerns could differentiate those with SP from those with PD or major depression or healthy controls (Rector et al., 2007; Rodriguez et al., 2004; Zinbarg et al., 1997). However, it should be noted that Rector et al. (2007) found that high AS cognitive concerns might also predict SP.

High AS has also been found among those with generalized anxiety disorder (GAD; e.g., Deacon & Abramowitz, 2006; Rodriguez et al., 2004) and non-clinical worriers (e.g., Viana & Rabian, 2008). Researchers have speculated that this connection may be due to the fear of uncontrollable psychological symptoms (i.e., worry) that can characterize both individuals with high AS and those with GAD (Rector et al., 2007). Consistent with this hypothesis, some studies suggest that GAD might be characterized by high AS cognitive concerns. For instance, of GAD, major depression, and SP, Rodriguez et al. (2004) found that AS cognitive scores were most closely associated with GAD. Similarly, Rector et al. (2007) found that those with GAD had higher cognitive concerns than those with SP, though not than those with PD.

Studies also consistently show that people with PTSD and PTSD symptoms have higher AS than those without (e.g., Asmundson & Stapleton, 2008; Hagh-Shenas, Goodarzi, Dohbozorgi, & Farashbandi, 2005). Second to PD, AS levels are highest amongst those with PTSD as compared to any other anxiety disorder (Taylor, Koch, & McNally, 1992). Moreover, the severity of PTSD symptoms is correlated with AS (Fedoroff, Taylor, Asmundson, & Koch, 2000; Stephenson, Valentiner, Kumpula, & Orcutt, 2009), and with AS physical concerns in particular (Asmundson & Stapleton, 2008; Feldner, Lewis, Leen-Feldner, Schnurr, & Zvolensky, 2006). However, studies have also found that AS cognitive concerns are particularly predictive of PTSD-relevant symptoms (Feldner et al., 2006; Lang, Kennedy, & Stein, 2002; Vujanovic, Zvolensky, & Bernstein, 2008). Researchers have suggested that high AS may amplify an individual's emotional reaction to trauma, making those with high AS more likely to develop PTSD after trauma exposure (Taylor, 2004). This hypothesis is supported by longitudinal studies showing that those with high AS were more likely to develop PTSD symptoms after a trauma (e.g., Keogh, Ayers, & Francis, 2002). However, researchers have also postulated that high AS might arise from trauma exposure (Taylor, 2004). Recent work supports a reciprocal relationship between AS and PTSD symptom levels in the year following a traumatic physical injury (Marshall, Miles, & Stewart, 2010).

It is not only anxiety disorders that have been associated with high AS. Researchers have also found higher levels of AS among individuals with depression as compared to healthy controls, on par with the magnitude of AS elevations among those with SP and GAD (Otto, Pollack, Fava, Uccello, & Rosenbaum, 1995). Longitudinal research has shown high AS to predict levels of depression five weeks later (Schmidt et

al., 1997). Several studies have shown that only the cognitive, and not the physical or social, factor of AS, predicts depressive symptoms in clinical (Cox, Enns, & Taylor, 2001; Taylor, Koch, Woody, & McLean, 1996; Zinbarg et al., 2001) and non-clinical samples (Deacon, Abramowitz, Woods, & Tolin, 2003). Carleton et al. (2009) found that AS cognitive concerns can distinguish between those with a depressive disorder versus healthy controls, even when the total ASI score cannot. Furthermore, depression, but not anxiety disorders, predicts scores on the AS cognitive concerns subscale (Rodriguez et al., 2004). Similarly, individuals with anxiety disorders with comorbid depression score higher on AS cognitive, but not physical or social, concerns, versus individuals with anxiety disorders without comorbid depression (Rector et al., 2007). Given these findings, researchers have suggested that AS cognitive concerns might be a "depression-specific form of anxiety sensitivity" (Taylor et al., 1996, p. 478). Depressive symptoms may be intensified by the fear of losing control captured by AS cognitive concerns (Watt & Stewart, 2008). However, our understanding of the specific link between depression and AS cognitive concerns is not completely clear; several studies have found major depression (Rodriguez et al., 2004) or depressive symptoms (Rector et al., 2007) to also be associated with high AS social concerns.

Unfortunately, much of the research into the relation between AS lower-order factors and psychopathology is limited due to the measurement of AS using the original ASI (Peterson & Reiss, 1992). The original 16-item ASI includes a physical concerns factor composed of eight items while the social and cognitive concerns factors are made up of four items each. This may limit the reliability of these latter two factors and fail to adequately index the social and cognitive concerns constructs. Moreover, some of the

items in the ASI may lack sufficient content validity because they do not target specific dimensions (Taylor et al., 2007). In the past, revisions to the ASI (Taylor & Cox, 1998a, b) have generally lacked a stable factor structure. Given these limitations, we cannot be entirely confident with the results of past studies of the relations between the ASI subscales and emotional disorder symptoms.

More recently, Taylor et al. (2007) constructed a new version of the ASI, the ASI-3. The ASI-3 consists of 18 items, with six items each comprising the physical, cognitive, and social concerns subscales. Their comprehensive construction and validation of the measure included a factor analysis replicated in six clinical and non-clinical samples from North American and European countries. The ASI-3 demonstrates good internal consistency, and convergent, discriminant, and criterion-related validity (Taylor et al., 2007). The use of the ASI-3 is thus preferred to the original ASI when studying the dimensions of AS.

After the development of the ASI-3, Taylor et al. (2007) called for further research into whether the prediction of psychopathology differs among the ASI-3 subscales. Only a few studies have addressed this research gap. Among trauma-exposed adults, Fetzner et al. (2011) found the physical concerns subscale of the ASI-3 to be the most robust predictor of PTSD symptoms. Whereas past research has also suggested an important role for cognitive concerns in PTSD (Feldner et al., 2006; Lang et al., 2002; Vujanovic et al., 2008), Fetzner et al. (2011) found this factor to only significantly predict hyperarousal. In another study, Carleton et al. (2010) found the social, but not physical or cognitive, concerns subscale of the ASI-3, to account for significant variance in social interaction and performance anxiety among a healthy sample.

Most recently, Kemper et al. (2012) examined how the ASI-3 subscales discriminated between different symptom patterns among a clinical sample. Consistent with prior research, they found that individuals with PD or agoraphobia reported more physical concerns than those with other mental health problems. Depressive symptoms showed the strongest association with the cognitive concerns subscale, fear of negative evaluation with social concerns, vigilance for body symptoms with physical concerns, and subjective physical complaints with the physical and cognitive concerns subscales.

Study Aims and Hypotheses

Given the limitations of the previous versions of the ASI, further research is needed to re-explore these questions with a scale that reliably and validly captures the three lower-order factors of AS (i.e., the ASI-3). The present study aimed to contribute to this important gap in the literature. We examined the unique associations between AS physical, cognitive, and social concerns with specific types of anxiety (i.e., panic, social anxiety, generalized anxiety, and posttraumatic stress) and depressive symptoms among a community-recruited, treatment-seeking sample of adults. We also considered the unique associations of the ASI-3 subscales to specific anxiety and depressive symptoms after controlling for other emotional disorder symptoms.

The present investigation extended the findings from the few previous studies using the ASI-3 by using a diverse and representative community-recruited sample of treatment-seeking adults. In addition, the present study examined a broad range of emotional disorder symptoms including panic, posttraumatic stress, generalized anxiety, depression, and social phobia fear and avoidance symptoms both as outcome and control variables. Social phobia fear and avoidance, generalized anxiety, and depression

symptoms have not yet been widely explored with the ASI-3. By considering a range of emotional disorder symptoms, this study provided the opportunity to investigate diagnostic specificity with respect to the ASI-3 subscales and build on work begun by Kemper et al. (2012).

Based on prior research, we expected AS to be associated with greater frequency and/or severity of symptoms of each of panic, generalized anxiety, posttraumatic stress, social anxiety, and depression. We also hypothesized that AS physical concerns would be associated with panic symptoms, AS social concerns would be associated with social anxiety, and AS cognitive concerns with posttraumatic stress, generalized anxiety, and depressive symptoms.

Method

Participants and Procedures

Participants for this investigation were treatment-seeking adults who were part of a larger randomized controlled trial investigating the efficacy of a telephone-delivered cognitive behavioural therapy intervention for high AS (Olthuis, Stewart, & Watt, 2012). Participants were recruited from the community via newspaper advertisements and posters displayed in educational and health centres. Given the requirements of the larger treatment study, to qualify for participation individuals had to meet the following inclusion criteria: (a) be 18 years of age or older, (b) be able to read English, (c) live in Nova Scotia, Canada, (c) have high AS, as indexed by a score of >23 on the ASI-3 (i.e., one standard deviation above the non-clinical ASI-3 mean; Reiss, Peterson, Taylor, Schmidt, & Weems, 2008), and (d) have good enough physical health to allow for 30 minutes per week of running/brisk walking for a period of seven weeks. (This latter

criterion was necessary as the treatment included a physical exercise component as interoceptive exposure.) Similarly, due to the constraints of the larger study in which this investigation was embedded, individuals were excluded from participation if they had active psychosis, current suicidal ideation, were already engaged in mental health treatment, or had started a new, or changed an existing, pharmacological treatment in the past three months.

Individuals responding to study advertisements contacted the researchers and completed a brief telephone screening to ensure they met the inclusion criteria. Of the 182 individuals who expressed interest in the study, nine were not interested in the treatment (e.g., treatment was too long, phone bill would be expensive), we lost contact with 17, and 53 did not qualify for participation (under 18 years, $n=1$; active psychosis, $n=1$; out of province, $n=2$; recent medication change, $n=4$; low AS, $n=11$; physical health limitation, $n=13$; engaged in other psychological treatment, $n=21$). Those participants who met criteria and consented to participate were mailed a self-report questionnaire to be completed and returned to the investigators by mail. In addition, participants' mental health diagnoses were assessed via a telephone-administered Structured Clinical Interview for DSM-IV (SCID-IV; First, Spitzer, Gibbon, & Williams, 1997). Eight clinical psychology doctoral students conducted the SCID-IV interviews, with weekly group supervision from one of two licensed clinical psychologists.

Of the 103 individuals eligible for the study, 85 people (M age = 36.3, SD = 11.4, range = 18-65 years; 80% women) completed the questionnaire and SCID-IV assessment and comprise the sample for the present study (the remaining 18 failed to return the questionnaire and/or complete the SCID-IV assessment). Participants' primary diagnoses

from the SCID-IV were: 18% SP, 13% GAD, 13% PD, 11% PD with Agoraphobia, 6%

Anxiety Disorder Not Otherwise Specified (ADNOS), 6% Major Depressive Disorder

(MDD), 5% Agoraphobia, 5% Adjustment Disorder, 2% Dysthymia, and 1% PTSD. The

remaining 20% of participants did not meet criteria for a current Axis I diagnosis. Forty

percent of participants had one or more current comorbid Axis I disorders (11% GAD,

10% SP, 7% PD, 5% MDD, 5% Substance Use Disorder, 4% Dysthymia, 4% OCD, 4%

PTSD, 2% Hypochondriasis, 1% Cyclothymia, 1% ADNOS, 1% Eating Disorder).

Power analysis with G*Power (1992-2008) suggested that 64 participants would

provide us with 80% power to detect a moderate correlation ($r = .30$) at $\alpha = 0.05$. Thus,

with 85 participants we were adequately powered for the present study.

Measures

Anxiety Sensitivity Index – 3 (ASI-3; Taylor et al., 2007). AS was measured

using the ASI-3, an 18-item self-report questionnaire composed of three six-item

subscales: physical (e.g., "It scares me when my heart beats rapidly"), cognitive (e.g.,

"When my mind goes blank, I worry there is something terribly wrong with me"), and

social (e.g., "It scares me when I blush in front of people") concerns. Participants are

asked to indicate the extent to which they agree or disagree with each item on a 5-point

Likert scale (0 = *very little* to 4 = *very much*). Subscale (range = 0-24) and total (range =

0-72) scores are calculated by summing relevant items. The ASI-3 has good internal

consistency (α's range from .76 to .86 for physical concerns, .79 to .91 for cognitive

concerns, and .73 to .86 for social concerns), and convergent, discriminant, structural,

and criterion-related validity (Taylor et al., 2007).

Panic Attack Questionnaire – IV (PAQ-IV; Norton, Zvolensky, Bonn-Miller, Cox, & Norton, 2008). Participants reported on their panic symptoms using sections of the PAQ-IV which assesses the specific features of PD. For the purposes of the present study, participants reported the degree to which they experience a series of 14 symptoms when they are having a panic attack (e.g., sweating, chest pain, fear of dying, etc.) on a 5-point Likert scale (0 = *doesn't occur* to 4 = *very severe*). Participants without panic attacks would thus score 0 on this measure. Scores are summed across the 14 items for a symptom severity score (range = 0-56). The PAQ-IV is a relatively new version of the original PAQ; however, previous versions have been empirically validated and the PAQ-IV has strong concurrent validity (Norton et al., 2008).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item self-report measure that assesses an individual's general tendency to worry excessively – the central feature of GAD. Participants are asked to indicate how typical each statement (e.g., "I worry all the time") is of them on a 5-point Likert scale (1 = *not at all typical* to 5 = *very typical*). The PSWQ has shown good internal consistency and test-retest reliability (Molina & Borkovec, 1994). Scores on the PSWQ (range = 16-80) have been found to be significantly higher among individuals with GAD than among those with any other anxiety disorder (Brown, Antony, & Barlow, 1992).

Life Stressor Checklist – Revised (LSC-R; Wolfe & Kimmerling, 1997) **and Modified PTSD Symptom Scale** (MPSS; Falsetti, Resnick, Resick, & Kilpatrick, 1993). Posttraumatic stress symptoms were measured in a two-step process. First, participants reported on their lifetime exposure to traumatic and stressful events using a modified

version of the LSC-R. Participants were presented with a list of traumatic events and asked to indicate whether any of the events had occurred. Only participants who indicated that they had experienced a traumatic event were asked to complete the MPSS. The MPSS assesses the frequency and severity of 17 posttraumatic stress symptoms corresponding to DSM-IV criteria. Participants reported how often they experience these symptoms (e.g., "Have you had repeated intrusive or upsetting thoughts or recollections of the event?") using a 4-point Likert scale (0 = *not at all* to 3 = *5 or more times per week*), as well as how severe these symptoms were using a 5-point scale (0 = *not at all distressing* to 4 = *extremely distressing*). A total score indexing frequency and severity was calculated by summing across all items (range = 0-119; scoring described in Falsetti et al., 1993). If participants reported experiencing more than one traumatic event they were asked to complete the MPSS while thinking about the event that was currently affecting them the most. Participants who did not report experiencing a DSM-IV qualifying traumatic event were excluded from analyses using the MPSS. The MPSS has shown good internal consistency and concurrent validity in prior research (Falsetti et al., 1993).

Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987). Social anxiety symptoms were measured using the LSAS. The LSAS presents participants with 16 social or performance situations (e.g., "calling someone you don't know very well") for which they are asked to rate their fear of each situation on a 4-point scale (0 = *none* to 3 = *severe*) as well as the degree to which they avoid each situation on a 4-point scale (0 = *never* to 3 = *usually*). The LSAS can be scored as a total score by summing across all items (range = 0-144) or as a set of subscale scores (e.g., fear and avoidance subscales)

by summing across the relevant items. Because the purposes of this investigation were to differentiate between different emotional disorder symptoms rather than amongst the nuances within disorder-specific symptoms, we used the LSAS total score in our analyses. Internal reliability of the LSAS is consistently strong and the LSAS has good convergent and discriminant validity (Heimberg et al., 1999).

Depression Anxiety Stress Scales – 21: Depression Subscale (DASS-21; Lovibond & Lovibond, 1995). Current depressive symptoms were measured using the DASS-21 Depression subscale, based on Clark and Watson's (1991) tripartite model of anxiety and depression. The DASS-21 is a shortened version of the original 42-item DASS. On the items that make up the depression subscale, participants indicate the extent to which a particular emotional state (e.g., "I felt down-hearted and blue") has applied to them over the past week on a 4-point scale (0 = *did not apply to me at all* to 3 = *applied to me very much or most of the time*). A score for the depression subscale was calculated by summing the seven items in the subscale and multiplying the score by 2 to allow for comparisons to DASS-42 severity ratings (range = 0-42). The DASS-21 Depression subscale has good internal consistency and good concurrent validity with the Beck Depression Inventory (Antony, Bieling, Cox, Enns, & Swinson, 1998).

Results

Overall, participants' scores on study measures (see Table 4.1) generally resemble those from clinical samples (e.g., Fresco, Mennin, Heimberg, & Turk, 2003; Heimberg & Holaway, 2007; Norton et al., 2008; Reiss et al., 2008). Mean ASI-3 scores ($M = 38.9$) were at least as high as those reported in other clinical samples of individuals with PD ($M = 32.6$) and SP ($M = 31.4$; Reiss et al., 2008). The mean score on the LSAS ($M = 65.9$)

fell within the "marked social phobia" range and was much higher than that found in non-anxious controls ($M = 13.7$), though somewhat less than scores seen in clinical samples with SP (e.g., $M = 74.41$; Heimberg & Holaway, 2007). The mean score on the PSWQ ($M = 62.0$) resembled that of clinical samples with GAD (e.g., $M = 68.1$; Fresco et al., 2003). As we used an abbreviated form of the PAQ-IV, we could not compare scores with clinical samples on this measure; however, symptom severity endorsement at an item level for the present sample seems to resemble that of clinical panickers (e.g., chest pain or discomfort $M = 1.66$ vs. $M = 1.57$; feelings of unreality $M = 1.57$ vs. $M = 1.71$; trembling or shaking $M = 2.35$ vs. $M = 2.05$, latter means from Norton et al., 2008). The mean score on the DASS-21 Depression subscale ($M = 18.1$) fell within the "moderate severity" range (Lovibond & Lovibond, 1995). This mean score is somewhat lower than the mean score on the DASS-21 Depression subscale among a clinical sample of individuals with MDD ($M = 29.96$) but somewhat higher than the mean score among individuals with PD ($M = 12.75$) or SP ($M = 13.19$; Antony et al., 1998).

Sixty-six participants reported experiencing a traumatic event and completed the MPSS. The most commonly reported traumatic events were: the sudden death of someone close to them ($n=32$), experiencing a serious physical or mental illness ($n=31$), witnessing violence between family members ($n=30$), being abused or physically attacked by someone they knew ($n=25$), and having a serious accident ($n=25$), but also included a range of other events (e.g., witnessing a serious accident, being in a serious disaster, being raped or sexually abused). The mean score on the MPSS ($M = 42.1$) did not reach the clinical cut-off for treatment samples (≥ 71) but came close to the clinical cut-off for community (≥ 46) samples (Falsetti et al., 1993).

Bivariate correlations between the ASI-3 subscales and each of the symptom measures can also be found in Table 4.1. The ASI-3 total score was correlated with each of the symptom measures except, somewhat unexpectedly, the PSWQ. As anticipated, the physical, cognitive, and social concerns subscales of the ASI-3 were strongly correlated with the ASI-3 total score and were generally related to each other. However, the physical and social concerns subscales were not correlated. There was also substantial inter-correlation among some of the outcome measures with the largest overlap occurring between the MPSS and the DASS-21 Depression scores and the DASS-21 Depression and the LSAS scores.

The ASI-3 subscales showed some unique and specific correlations with the emotional disorder symptom measures. The cognitive subscale, only, was correlated with scores on the measures of depressive (DASS-21) and posttraumatic stress (MPSS) symptoms. Both the social and cognitive subscales were correlated with social phobia (LSAS) symptom scores, and both the physical and social subscales were correlated with panic (PAQ-IV) symptom scores. As with the ASI-3 total score, none of the ASI-3 subscales was correlated with scores on the PSWQ.

We conducted a series of five multiple linear regression analyses to examine the unique relations between each of the ASI-3 subscales and the anxiety and depression symptom measures. For each multiple regression, the physical, cognitive, and social subscales of the ASI-3 were entered together as a block (i.e., in one step) as predictor variables and one of the five symptom measures (i.e., the PAQ-IV, PSWQ, MPSS, LSAS, or DASS-21 Depression subscale) was entered as the outcome or criterion variable. This approach allowed us to account for overlap between the predictors (i.e., the AS subscales)

and between the predictors and the criterion variables while identifying unique variance in the criterion variable accounted for by each of the predictors. Results of these analyses are reported in Table 4.2. First, physical concerns emerged as the only significant predictor of unique variance in panic symptoms on the PAQ-IV, $\beta = 0.30$, $p = .007$. Second, none of AS physical, social, or psychological concerns emerged as significant predictors of generalized anxiety on the PSWQ. Third, cognitive concerns emerged as the only significant predictor of unique variance in DASS-21 Depression symptoms, $\beta = 0.41$, $p = .001$. Fourth, both social, $\beta = 0.36$, $p = .001$, and cognitive, $\beta = 0.23$, $p = .044$, concerns were found to predict significant, unique variance in social anxiety symptoms on the LSAS. Finally, while the overall regression model did not significantly predict posttraumatic stress symptoms, unique variance in posttraumatic stress symptoms on the MPSS was marginally predicted only by the cognitive concerns subscale of the ASI-3, $\beta = 0.25$, $p = .065$.

Next, we re-ran these analyses looking at the unique relations between the ASI-3 subscales and specific anxiety and depressive symptom measures after controlling for participants' other emotional disorder symptoms. To do this we conducted a subsequent four multiple linear regressions. In each of these regressions, one of the PAQ-IV, PSWQ, LSAS, or DASS-21 Depression subscale was entered as the outcome or criterion variable. Then, the remaining symptom measures were entered together as a block in the first step of the regression and the physical, cognitive, and social subscales of the ASI-3 were entered together as a block in the second step of the regression. The MPSS was not entered as a control variable because only data for trauma-exposed individuals were available. We conducted a supplemental multiple linear regression with the MPSS as the

outcome variable and including only trauma-exposed individuals. In this supplemental

regression the other emotional disorder measures were entered together as a block in the

first step of the regression and the ASI-3 subscales were entered together in the second

step of the regression. Overall, this approach allowed us to look at the role of our primary

variables of interest (the AS subscales) while controlling for the influence of emotional

disorder symptoms.

The block of other emotional disorder symptom scales predicted significant

variance in each of the five outcomes ($R^2 = .15$, $p = .008$ for PAQ-IV to $R^2 = .26$, $p =$

.001 for MPSS). AS subscales provided unique information over and above the influence

of other emotional disorder symptoms in three of five cases (i.e., all but PSWQ and

MPSS scores). In the case of the PSWQ ($\Delta R^2 = .06$, $p = .158$) and the MPSS ($\Delta R^2 = .01$,

$p = .841$), the second step of the regression model, including the ASI-3 subscales, did not

predict significant variance in symptoms. Physical concerns continued to emerge as the

only significant AS subscale predictor of unique variance in panic symptoms on the

PAQ-IV, $\beta = 0.29$, $p = .010$, and cognitive concerns continued to emerge as the only

significant AS subscale predictor of unique variance in DASS-21 Depression symptoms,

$\beta = 0.38$, $p = .001$. Social concerns (and no longer cognitive concerns) was the only AS

subscale to predict significant, unique variance in social anxiety symptoms on the LSAS,

$\beta = 0.35$, $p = .001$. Results for the PAQ-IV, DASS-21 Depression, and LSAS are reported

in Table 4.3.

Discussion

The present study investigated the unique associations between the ASI-3

subscales – physical, cognitive, and social concerns – and specific types of anxiety and

depressive symptoms. While the AS subscales have previously been linked with particular mental health problems (for reviews, see Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009), much of this research is limited due to the use of the original 16-item ASI (Peterson & Reiss, 1992) which did not adequately assess each of the three components of AS (Taylor et al., 2007). In the present study, we aimed to overcome this limitation by using the ASI-3 to comprehensively assess the physical, cognitive, and social components that comprise AS (Taylor et al., 2007).

The present findings support prior research showing an association between AS, as a global construct, and a variety of anxiety (panic symptoms, social anxiety) and depressive symptoms (for reviews, see Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009), including posttraumatic stress symptoms among trauma exposed individuals. The present sample of treatment-seeking adults reported mean ASI-3 scores ($M = 38.9$) at least as high as those reported in other samples of individuals with PD ($M = 32.6$) and SP ($M = 31.4$) and, as expected given they were selected for their high AS levels, much more severe than non-clinical samples ($M = 12.8$; Reiss et al., 2008).

The present findings also suggest important specificity with respect to the relations between the ASI-3 subscales and particular types of anxiety and depressive symptoms. First, we found that physical concerns, only, predicted unique variance in panic symptoms (PAQ-IV), even when controlling for symptoms of other emotional disorders. This finding is in line with theories of panic (Clark, 1986; Pilecki et al., 2011) and prior cross-sectional (Rector et al., 2007; Zinbarg et al., 1997), longitudinal (Grant et al., 2007), and experimental (Zvolensky et al., 2001) research with the ASI suggesting a strong relation between AS physical concerns and panic symptoms. Using the ASI-3,

Kemper et al. (2012) also found a strong relation between AS physical concerns and body vigilance, a panic-relevant characteristic.

Not unexpectedly, we also found a unique relation between the DASS-21 Depression scale and AS cognitive, but not physical or social, concerns. Again, this finding held true when controlling for symptoms of other emotional disorders. This result is very much in line with past findings (Carleton et al., 2009; Cox et al., 2001; Kemper et al., 2012; Rodriguez et al., 2004; Zinbarg et al., 2001) and adds to the growing body of research in support of AS cognitive concerns as being the unique component of AS associated with depression (Taylor et al., 1996). Longitudinal studies would be helpful to further understand the relationship between these constructs.

Finally, we found that both social and cognitive concerns predicted significant variance on a measure of fear and avoidance of social and performance situations. This result extends recent findings with the ASI-3 showing a link between AS social concerns and social anxiety symptoms among a non-clinical sample (Carleton et al., 2010) and between AS social concerns and fear of negative evaluation among a clinical sample (Kemper et al., 2012). Interestingly, we also found an association between cognitive concerns and social anxiety symptoms; this is not a consistent finding in prior research with the original ASI. Previous studies with the ASI-3 have found a significant bivariate correlation between cognitive concerns and social anxiety but have not found the ASI-3 cognitive concerns subscale to be predictive of social anxiety when controlling for other AS dimensions (Kemper et al., 2012). Several possibilities exist for the present finding. First, individuals with high cognitive concerns may worry that losing control of mental faculties may result in social displays of odd behaviour resulting in embarrassment. This

worry may contribute to symptoms of social anxiety. It may be that this relation has only been identified now because the original ASI, unlike the ASI-3, did not adequately assess AS cognitive concerns. Second, or perhaps in addition, this finding may have arisen because AS cognitive concerns may be more closely linked to social anxiety avoidance behaviours rather than strictly social fear. The use of the LSAS in the present study allowed us to assess these avoidance behaviours which were not assessed by Kemper et al. (2012), who measured only individuals' degree of social fear using the Fear of Negative Evaluation scale (Watson & Friend, 1969). This hypothesis is supported by prior research showing AS (White et al., 2006), and cognitive concerns in particular (among adolescents; Wilson & Hayward, 2006), to be predictive of behavioural avoidance. Finally, this finding may be partly due to the correlation between social anxiety and depressive symptoms in the present study ($r = .38$, $p<.001$), as research suggests individuals with comorbid depression score higher on AS cognitive (but not physical or social) concerns as compared to individuals without this comorbidity (Rector et al., 2007). In support of this hypothesis, when we accounted for symptoms of other emotional disorders in our regression analysis we found that AS cognitive concerns no longer predicted variance in LSAS symptoms while both AS social concerns and depressive symptoms did.

With respect to posttraumatic stress symptoms, results must be interpreted remembering that analyses were conducted with only those participants who endorsed experiencing a DSM-IV traumatic event. Consequently, our power to detect small effects with respect to the MPSS may be limited. Furthermore, the sample is limited in its non-specificity to PTSD: only 5% of participants qualified for a primary or secondary PTSD

diagnosis. As such, findings are relevant to posttraumatic stress symptoms but may not be representative of the relation of AS to PTSD among a sample meeting diagnostic criteria. Nevertheless, other researchers have also explored the association between AS and posttraumatic stress symptoms among trauma-exposed individuals who do not necessarily meet criteria for a PTSD diagnosis (Fetzner et al., 2011).

Overall, regression analyses looking at the association of ASI-3 subscales with posttraumatic stress symptoms, both before and after controlling for other emotional disorder symptoms, were not significant. However, because our sample was small and a trend in the expected direction was observed, we offer some interpretation of the ASI-3 – posttraumatic stress symptoms association here. AS cognitive concerns emerged as a marginally significant unique predictor of posttraumatic stress symptoms when emotional disorder symptoms were not controlled for. This finding is in line with several studies showing that AS cognitive concerns are predictive of PTSD symptoms (Feldner et al., 2006; Lang et al., 2002; Vujanovic et al., 2008). However, studies (Asmundson & Stapleton, 2008; Feldner et al., 2006), including one using the ASI-3 (Fetzner et al., 2011), have also found AS physical concerns to predict posttraumatic stress symptoms, which we did not. This discrepancy might be due to sample differences; while both we and Fetzner et al. (2011) used community-recruited samples, we limited participants to those who were interested in and able to perform physical activity. It may be that some individuals with high physical concerns and posttraumatic stress symptoms elected not to participate or were ineligible for participation in the study because of the physical exercise component. Alternatively, this discrepancy may be due to measurement differences; Fetzner et al. (2011) measured posttraumatic stress symptoms using the

Posttraumatic Stress Disorder Checklist – Civilian (Weathers, Litz, Herman, Huska, & Keane, 1994) which asks individuals to report how much they have been bothered by a symptom, while we used the MPSS which measures participants' frequency and severity of symptoms. It may be that ASI subscales are differentially related to these different aspects of posttraumatic stress symptoms. Finally, as suggested above, due to the non-specificity of our sample for PTSD diagnoses, we may have missed important connections between AS physical concerns and PTSD symptoms. Further research in this area is needed.

Importantly, marginal effects of AS cognitive concerns on posttraumatic stress symptoms disappeared when controlling for symptoms of other emotional disorders. The role of cognitive concerns in posttraumatic stress symptoms may be accounted for by its correlation with depressive symptoms ($r = .39$, $p<.01$ in the present study) which also show a strong association with AS cognitive concerns. This overlap will be an important consideration in future studies.

In light of the unique associations between the ASI-3 subscales and anxiety and depressive symptoms found here, it is notable that none of the ASI-3 subscales were predictive of generalized anxiety symptoms, as measured by the PSWQ, either before or after controlling for the influence of other emotional disorder symptoms. Furthermore, the total ASI-3 score was not correlated with the PSWQ in contrast to prior research, which found a strong positive correlation between PSWQ scores and total AS among non-clinical worriers using a previous version of the ASI (Viana & Rabian, 2008), and that AS cognitive concerns were more strongly predictive of a diagnosis of GAD than of major depression or SP (Rodriguez et al., 2004). Although our sample is relatively small,

the failure to detect this relation was not likely due to a lack of power, as a power analysis suggests we were adequately powered to detect moderate effects (see Method). Instead, this negative finding is in line with McNally's (2002) contention that AS is much more relevant for PD than for GAD. He suggested that while both groups experience anxiety symptoms, only those with PD display a marked fear of the symptoms themselves (McNally, 2002). To our knowledge, there have been no other studies looking at the PSWQ and the ASI-3. In light of our negative findings and previous mixed findings, the relation between GAD-like symptoms and AS, including AS cognitive concerns, warrants further examination with the ASI-3.

Taken together, the results of this study have several important implications. First, results confirm important specificity with respect to the relations among the lower-order factors of AS and different mental health problems. This finding emphasizes the importance of considering the multidimensional nature of AS in furthering our understanding of its role in anxiety and depression. Second, the results found in the present investigation using the ASI-3, and their degree of consistency with previous studies using the original ASI, lend credence to the results found in this prior body of work. In other words, these findings suggest that we can be somewhat confident in previously discovered associations linking AS cognitive concerns with depression, AS physical concerns with panic, and AS social concerns with social anxiety. Third, the manner in which our findings deviate from prior research suggest areas that require closer scrutiny. For instance, the relation between AS cognitive concerns and GAD symptoms remains as of yet unclear, as does the possible importance of cognitive concerns to symptoms of social anxiety. The number of discrepancies between prior research and the

current findings with respect to AS cognitive concerns suggests that, indeed, the improved psychometric properties of the ASI-3 in measuring this particular lower order factor may more accurately elucidate the relevance of AS cognitive concerns to psychopathology. Alternatively, our findings suggest a potentially important role for comorbid depressive symptoms in explaining the association between AS cognitive concerns and both posttraumatic stress and social anxiety symptoms. Finally, the present results suggest ways in which research might focus on specific AS concerns in understanding how AS serves as a risk and/or maintenance factor in the development and maintenance of anxiety and depression.

The results of this investigation should be considered in light of several limitations. First, all symptom measures were self-report, allowing for the possibility that participants under- or over-reported the severity and/or frequency of their mental health symptoms. Second, data was collected at a single time point, preventing any inferences about the causal links between AS physical, cognitive, and social concerns and anxiety and/or depressive symptoms. Future longitudinal research should continue to examine the role of AS and its components in the development and maintenance of anxiety and depression. Third, the sample size and the limited number of participants in each distinct diagnostic category prevented an examination of the contribution of the ASI-3 subscales in predicting different diagnoses. As such, future research should address this gap in the literature. Fourth, because we restricted participants to those with high AS, the independent and dependent variables may suffer from range restriction due to the highly symptomatic nature of the sample. Moreover, the relations observed amongst the AS factors and psychopathology in the present study may not hold true for those with lower

AS levels. Nevertheless, our interest lies in understanding how AS might contribute to mental health symptoms and thus examining these relations amongst a symptomatic sample is very informative. Fifth, because the ASI-3 measures AS among adults, these findings are limited to adult populations. While researchers have investigated the unique contributions of AS lower order factors to psychopathology among youth (e.g., McLaughlin, Stewart, & Taylor, 2007), these studies used the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991) which suffers from many of the same limitations as the original ASI. A revision of the CASI and future research into the utility of its factors in predicting youth mental health problems may be warranted.

Finally, the present results must be interpreted with consideration to the nature of our sample. We selected participants for their high AS status rather than their diagnosis, resulting in overlap amongst the anxiety and depressive symptoms reported by each participant. In other words, there was comorbidity in our sample and correlations between symptom measures. Most notably, depressive symptoms were positively associated with a number of anxiety disorder symptoms. This overlap may complicate the unique symptom – AS factor associations that we investigated (i.e., relations between AS factors and particular symptoms might be partially explained by a common comorbidity or co-occurring symptom pattern) and so the present findings should be considered with this in mind. Nevertheless, we attempted to account for this comorbidity by including other emotional disorder symptoms in our regression analyses with many findings staying consistent in this context. Furthermore, our use of a treatment-seeking community sample reflects real world clinical presentations (i.e., anxiety comorbid with depressive

symptoms) making our findings relevant to assessment and treatment in the clinic. The concordance of our findings with prior research also supports the validity of our findings.

Ultimately, understanding the unique contributions of the lower order factors of AS to different types of emotional symptoms will help to identify individuals' specific vulnerabilities to emotional disorders and inform targeted intervention and prevention efforts. Given the relevance of AS to such a range of mental health problems, researchers are already looking at AS treatment strategies such as physical exercise (e.g., Smits et al., 2008) and cognitive behavioural therapy (e.g., Watt & Stewart, 2008; Watt, Stewart, Lefaivre, & Uman, 2006). Furthermore, specific information about the relevance of AS lower order factors to emotional disorder symptoms might inform treatment components. For instance, when high AS physical concerns are problematic (i.e., with panic), interoceptive exposure activities, such as physical exercise, aimed at reducing fear of arousal-related sensations might be particularly useful. In addition, consideration of AS lower order factors as underlying contributors to multiple diagnoses may help in the formulation of transdiagnostic treatments. For example, by targeting AS cognitive concerns, a clinician might be able to reduce both social anxiety and depressive symptoms. Further research in this area will continue to elucidate ways in which targeting AS and its components can help treat psychopathology.

Table 4.1

Means, Standard Deviations, Reliability Statistics, and Bivariate Correlations for Study Measures

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. ASI-3 Total	38.94	13.51	.88	.73***	.80***	.63***	.34**	.06	.27*	.43***	.30**
2. ASI-3 Physical	11.45	6.51		.87	.35**	.17	.34**	.05	.11	.18	.13
3. ASI-3 Cognitive	10.29	6.91			.92	.30**	.17	-.06	.29*	.34**	.40***
4. ASI-3 Social	17.20	5.27				.84	.23*	.15	.16	.43***	.10
5. PAQ-IV	22.71	13.72					.84	.31**	.33**	.19	.23**
6. PSWQ	62.04	10.26						.76	.22	.23*	.27*
7. MPSS^	42.06	32.38							.97	.21	.39**
8. LSAS	65.85	29.05								.96	.38***
9. DASS-Dep	18.09	12.46									.91

Note: Cronbach's alpha for each measure is presented on the diagonal. ASI – 3 = Anxiety Sensitivity Index – 3; DASS-Dep = Depression Anxiety Stress Scales, Depression subscale; LSAS = Liebowitz Social Anxiety Scale; MPSS = Modified PTSD Symptom Scale; PAQ-IV = Panic Attack Questionnaire – IV; PSWQ = Penn State Worry Questionnaire; ***p<.001; **p<.01, *p<.05. ^Only participants endorsing a DSM-IV qualifying Criterion A traumatic event are included in means, standard deviations, and correlations with the MPSS.

Table 4.2

Multiple Regression Analyses of the ASI-3 Subscales on Mental Health Symptoms

Outcome Variable	Predictor Variables	β	*t*	Sr^2	R^2
1. PAQ-IV Total					.15**
	Physical Concerns	.25	2.09*	.08	
	Cognitive Concerns	.12	.93	.00	
	Social Concerns	.15	1.23	.03	
2. PSWQ					.04
	Physical Concerns	.07	.59	.00	
	Cognitive Concerns	-.13	-1.10	.01	
	Social Concerns	.18	1.54	.02	
3. DASS-21 Depression					.16**
	Physical Concerns	-.01	-.08	.00	
	Cognitive Concerns	.41	3.59**	.13	
	Social Concerns	-.03	-.23	.00	
4. LSAS					.24***
	Physical Concerns	.03	.23	.00	
	Cognitive Concerns	.23	2.08*	.04	
	Social Concerns	.34	3.39**	.11	
5. MPSS^					.08
	Physical Concerns	.03	.23	.00	
	Cognitive Concerns	.25	1.88+	.05	
	Social Concerns	.03	.26	.00	

Note. DASS-21 Depression = Depression Anxiety Stress Scales, Depression subscale; LSAS = Liebowitz Social Anxiety Scale; MPSS = Modified PTSD Symptom Scale; PAQ-IV = Panic Attack Questionnaire – IV; PSWQ = Penn State Worry Questionnaire; ***$p<.001$; **$p<.01$, *$p<.05$, +$p<.08$. ^Only participants endorsing a DSM-IV qualifying Criterion A traumatic event are included in regression analyses with the MPSS.

Table 4.3

Multiple Regression Analyses of the ASI-3 Subscales on the PAQ-IV, DASS-21

Depression, and LSAS When Controlling for Comorbid Emotional Disorder Symptoms

	β	t	Sr^2	R^2	ΔR^2
1. Outcome Variable: PAQ-IV					
Step 2				.25	.11*
PSWQ	.22	2.00*	.04		
DASS-21 Depression	.20	1.66	.03		
LSAS	-.06	-.48	.00		
ASI-3 Physical Concerns	.29	2.66*	.07		
ASI-3 Cognitive Concerns	-.02	-.13	.00		
ASI-3 Social Concerns	.17	1.44	.02		
2. Outcome Variable: DASS-21 Depression					
Step 2				.34	.12**
PAQ	.18	1.66	.02		
PSWQ	.23	2.23*	.04		
LSAS	.26	2.31*	.05		
ASI-3 Physical Concerns	-.13	-1.19	.02		
ASI-3 Cognitive Concerns	.38	3.50**	.11		
ASI-3 Social Concerns	-.16	-1.52	.02		
3. Outcome Variable: LSAS					
Step 2				.33	.16**
PAQ	-.05	-.48	.00		
PSWQ	.14	1.27	.01		
DASS-21 Depression	.26	2.31*	.05		
ASI-3 Physical Concerns	.04	.34	.00		
ASI-3 Cognitive Concerns	.14	1.17	.01		
ASI-3 Social Concerns	.35	3.40**	.10		

Note. Step 1 (i.e., emotional disorder symptom scales as predictors) in each regression equation is not reported here simply in order to condense space as they are not the primary focus.; ASI-3 = Anxiety Sensitivity Index – 3; DASS-21 Depression = Depression Anxiety Stress Scales, Depression subscale; LSAS = Liebowitz Social Anxiety Scale; PAQ-IV = Panic Attack Questionnaire – IV. ***p<.001; **p<.01, *p<.05.

CHAPTER 5. PROLOGUE TO STUDY 3 AND STUDY 4

Findings from Study 2 serve as confirmation of prior research that anxiety sensitivity (AS) is linked to a number of anxiety and mood symptoms. Moreover, Study 2 highlighted the unique associations between the lower-order factors of AS and specific disorders: physical concerns with panic, cognitive concerns with depression, and social concerns with social phobia. There were also some hints of possible associations of cognitive concerns with social phobia and posttraumatic stress. Taken together with the extant literature on AS, it seems that AS would be an appropriate target for transdiagnostic treatment. In other words, if we can reduce AS via treatment we might expect to see related reductions in anxiety and mood symptoms that are associated with elevated levels of AS.

The aim of Study 3 and Study 4 was to test this hypothesis. Study 3 and 4 report the results of a randomized controlled trial of the efficacy of an eight session telephone-delivered cognitive behaviour therapy (CBT) treatment in reducing high AS, as compared to a waiting list control. In addition to exploring the effect of treatment on AS, Study 3 reports the effects of treatment on panic, social phobia, generalized anxiety, posttraumatic stress, and depressive symptoms. Though not yet explored in this dissertation, Study 4 reports the effects of this treatment on alcohol use outcomes so as to truly explore the intervention's transdiagnostic implications. A growing body of research has linked high, vs. low, AS to more frequent endorsement of alcohol use (Stewart, Peterson, & Pihl, 1995), alcohol-related problems (Watt, Stewart, Birch, & Bernier, 2006a), and risky drinking motives (Stewart, Zvolensky, & Eifert, 2001).

Taken together, Study 3 and Study 4 provide insight into the possibility of using an AS-targeted intervention to address symptoms across diagnostic categories. In other words, they explore they utility of using transdiagnostic treatment to address some of the barriers to treatment at the treatment efficacy level. Moreover, because the treatment tested in Study 3 and 4 is telephone-delivered, it also integrates findings from Study 1, suggesting that delivering therapy over a distance is an effective way to overcome practical and emotional barriers to treatment at the individual level. As such, the trial reported in Study 3 and 4 represents a culmination of research into ways to reduce barriers to treatment access for individuals with anxiety disorders in need of care.

CHAPTER 6. STUDY 3: TELEPHONE-DELIVERED CBT FOR HIGH ANXIETY
SENSITIVITY: A RANDOMIZED CONTROLLED TRIAL[3]

Abstract

Objective. High anxiety sensitivity (AS) is associated with the development and
maintenance of anxiety and depressive symptoms, and is theorized to be a mediator of
treatment outcomes for anxiety and depression. The present study tested the efficacy of a
telephone-delivered cognitive behavioural therapy (CBT) intervention in reducing high
AS and its associated anxiety and depressive symptoms. **Method**. Treatment-seeking
participants with high AS were recruited from the community ($N = 80$; M age = 36 years;
79% women; 76% Caucasian) and randomly assigned to an eight week telephone CBT
program or a waiting list control. Participants completed a series of anxiety and
depression symptom and diagnostic measures at pre- and post-treatment. **Results**.
Multilevel modeling showed the treatment was successful in reducing AS, as well as
panic, social phobia, posttraumatic stress symptoms, and number of DSM-IV-TR
diagnoses per participant when compared to a waiting list control, and these gains were
generally maintained at 12 week and 20 week follow-ups. Generalized anxiety and
depressive symptoms, however, did not improve as a result of treatment. Mediated
moderation analyses showed treatment-related changes in AS mediated anxiety symptom
changes. **Conclusion**. Results of the present study provide promising evidence for this
transdiagnostic treatment approach. Reductions in anxiety symptoms across diagnostic
categories stemming from this AS-targeted intervention may have implications for

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[3] This article is adapted from 'Olthuis, J. V., Watt, M. C., Mackinnon, S. P., & Stewart, S. H. (2013).
Telephone-delivered CBT for high anxiety sensitivity: A randomized controlled trial' and is currently under
review (revise/resubmit) at a peer-reviewed journal. As first author of this article, I designed the study,
organized and managed participant recruitment, collected data including conducting standardized
assessments, delivered therapy, conducted the data analyses with the guidance of S. P. Mackinnon, wrote
the manuscript and revised the manuscript in accordance with suggestions from my co-authors.

helping a broad array of clients with various anxiety disorders and comorbid conditions that share AS as a common risk or maintenance factor.

Introduction

Anxiety disorders are one of the most common mental health problems worldwide, with yearly prevalence estimates ranging from 8-18% (Alonso & Lépine, 2007; Kessler, Chiu, Demler, & Walters, 2005b). They have an early onset (Kessler, 2007) and a chronic course (Bruce et al., 2005), are associated with significant functional impairment (Bijl & Ravelli, 2000), and often lead to the adoption of maladaptive strategies to reduce anxiety (Badour, Blonigen, Boden, Feldner, & Bonn-Miller, 2012). Moreover, high rates of comorbidity can exacerbate anxiety. Anxiety disorders often co-occur with each other and with mood disorders (Alonso & Lepine, 2007; Kessler et al., 2005b), with rates of comorbidity in clinical samples reaching greater than 50% (Brown, Campbell, Lehman, Grisham, & Mansell, 2001).

Evidently, there is a need for treatment for anxiety and its comorbidities. It is widely recognized that cognitive behavioural therapy (CBT) is an effective treatment for various anxiety disorders, including panic disorder (PD), social phobia (SP), generalized anxiety disorder (GAD), and posttraumatic stress disorder (PTSD) (Norton & Price, 2007; Stewart & Chambless, 2009), and for depression (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). However, the current trend in CBT practice is to treat comorbidities consecutively or in parallel rather than in an integrated manner. Some studies show that comorbidity does not interfere with treatment outcomes (Allen et al., 2010; Tsao, Mystkowski, Zucker, & Craske, 2002) while others suggest comorbid conditions may disrupt treatment efficacy (Chambless, Renneberg, Gracely, Goldstein, &

Fydrich, 2000; Farris, Epstein, McCrady, & Hunter-Reel, 2012). Given the prevalence of

comorbidity, researchers are exploring integrated interventions targeted at transdiagnostic

risk factors. Transdiagnostic interventions assume that mental health problems are

manifestations of shared risk factors or core processes (e.g., high neuroticism); thus,

treatment targeting these underlying factors/processes could reduce symptoms across a

range of disorders (Barlow, Allen, & Choate, 2004; Ellard, Fairholme, Boisseau,

Farchione, & Barlow, 2010).

A salient example of a transdiagnostic intervention is Barlow's (2011) Unified

Protocol which teaches neurotic individuals to respond adaptively to strong negative

affect by adjusting maladaptive cognitive appraisals, modifying emotion-driven

behaviour, and preventing emotional avoidance (Barlow et al., 2004). Preliminary studies

of this intervention have shown it to successfully reduce anxiety and depressive

symptoms across diagnostic categories (Ellard et al., 2010; Farchione et al., 2012). Given

the promise of this treatment approach, the present study aimed to test a similar trans-

diagnostic intervention. Instead of neuroticism, however, we targeted the underlying risk

factor of anxiety sensitivity (AS).

AS is an individual difference factor implicated in the development and

maintenance of anxiety disorders (Olatunji & Wolitzky-Taylor, 2009). More specifically,

AS is an enduring fear of arousal-related physiological sensations (e.g., increased heart

rate) arising from the tendency to interpret these sensations catastrophically, believing

that they will have serious physical, psychological, or social consequences (Reiss, 1991;

Reiss & McNally, 1985). For example, an individual with high AS who experiences a

racing heart might fear this sensation portends a heart attack. In contrast, those with low AS regard these sensations as unpleasant but harmless.

Clark's cognitive theory of panic (1986) provides one model for understanding the role of AS in psychopathology. In this model, when an individual interprets an otherwise benign arousal-related sensation catastrophically (similar to a person with high AS) his/her perception of threat is enhanced, leading to increased severity of arousal symptoms and maladaptive behaviours (e.g., panic attacks, avoidance). Accordingly, studies have shown that high AS predicts fearful responding to physical sensations generated by a CO_2 challenge (Zvolensky, Feldner, Eifert, & Stewart, 2001) and that AS is high among those with PD (Taylor, Koch, McNally, & Crockett, 1992b). High AS prospectively predicts the development of panic attacks (Schmidt, Lerew, & Jackson, 1997). Consistent with its theoretical role in motivating avoidance, AS is associated with agoraphobia symptoms (White, Brown, Somers, & Barlow, 2006).

Next to PD, AS levels are highest among those with PTSD (Taylor, Koch, & McNally, 1992a). Studies consistently show that people with PTSD symptoms have higher AS than those without (Asmundson & Stapleton, 2008) and that AS and PTSD symptom severity are correlated (Stephenson, Valentiner, Kumpula, & Orcutt, 2009). Researchers have suggested that AS may amplify the emotional reaction to trauma (Taylor, 2004) and longitudinal studies do show that those with high AS are more likely to develop PTSD symptoms after a trauma (Keogh, Ayers, & Francis, 2002). However, researchers have also postulated that high AS might arise from trauma exposure (Taylor, 2004) or that there may be a reciprocal relationship between AS and PTSD symptoms after a trauma exposure (Marshall, Miles, & Stewart, 2010).

High levels of AS also exist among those with SP (Norton, Cox, Hewitt, & McLeod, 1997). This is likely due to the fear that a display of observable anxiety symptoms might lead to negative public evaluation (Cox, Borger, & Enns, 1999). In accordance, research has shown that lower AS levels predict recovery from SP (Vriends et al., 2007). High AS has also been found among those with GAD (Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004) and non-clinical worriers (Viana & Rabian, 2008). This connection may be due to the fear of uncontrollable psychological symptoms (i.e., worry) that can characterize both high AS and GAD (Rector, Szacun-Shimizu, & Leybman, 2007).

People with depression also report higher AS levels as compared to healthy controls, and depressed people's AS levels are on par with those seen in anxiety disorders (Otto et al., 1995). Moreover, high AS predicts depression five weeks later (Schmidt et al., 1997). Several studies have shown that the cognitive concerns lower order factor of AS (which captures a fear of losing control), rather than the physical or social concerns factors, predicts depressive symptoms in clinical (Cox, Enns, & Taylor, 2001) and non-clinical samples (Deacon, Abramowitz, Woods, & Tolin, 2003). In fact, AS cognitive concerns have been argued to be a "depression-specific form of anxiety sensitivity" (Taylor, Koch, Woody, & McLean, 1996, p. 478).

In light of the relation between AS and anxiety and depression, it seems useful to explore interventions that target AS; such interventions may have transdiagnostic implications. Research shows that CBT-oriented interventions which include psychoeducation and cognitive restructuring and/or focus on interoceptive exposure to arousal-related body sensations can reduce high AS (Keough & Schmidt, 2012; Smits,

Berry, Tart, & Powers, 2008b; Watt, Stewart, Lefaivre, & Uman, 2006b). Moreover, AS is a mediator of anxiety and depression treatment outcome (Arch, Wolitzky-Taylor, Eifert, & Craske, 2012; Otto et al., 1995; Smits, Powers, Cho, & Telch, 2004) including Barlow's Unified Protocol (Sauer-Zavala et al., 2012).

Given the promise of an AS-focused intervention for reducing anxiety and depression, our objective was to test the efficacy of a CBT intervention designed to reduce high AS. In addition, we aimed to deliver the treatment in a way that would increase its accessibility. According to a national survey, only 11% of those with a current anxiety disorder received some form of treatment in the previous year (Ohayon, Shapiro, & Kennedy, 2000). Obstacles to treatment can include time constraints and other responsibilities (e.g., work, childcare), transportation difficulties, a lack of qualified clinicians or available services, fear of stigma, physical or mental health conditions limiting travel, and long waiting lists (Collins, Westra, Dozois, & Burns, 2004; Mojtabai et al., 2011). Many of these barriers are particularly relevant for rural communities, which tend to have fewer services and qualified clinicians, and longer commutes to services (Hauenstein et al., 2006). These obstacles can discourage individuals from seeking treatment, increase the severity of psychopathology, and create a negative relationship between treatment seekers and service organizations (McGrath & Cunningham, 2005).

A distance delivery approach to treatment is one way to increase access to services while still delivering empirically-supported treatment. Distance-based treatment involves using remote communication technologies (e.g., telephone, email, videoconferencing) to connect therapist and client, in place of face-to-face meetings. This

communication is supplemented by the provision of materials to the client by mail, book, and/or the Internet. Distance delivery can facilitate treatment access for those with difficulties getting to services and increase patient confidentiality by allowing individuals to engage in treatment from the privacy of their home. Recent systematic reviews of distance-based treatment suggest that distance-based CBT is more effective than a waiting list control and as effective as face-to-face CBT in treating anxiety and depression (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Bee et al., 2008; Spek et al., 2007).

Study Aims and Hypotheses

The present study had two objectives. First, we aimed to test the efficacy of a telephone-delivered CBT intervention for AS in reducing AS among a community sample of treatment-seeking individuals with high AS. Second, we explored the transdiagnostic implications of this intervention by examining changes in panic, generalized anxiety, posttraumatic stress, SP, and depression symptoms pre- to post-treatment. The current treatment was developed from an evidence-based brief CBT protocol for reducing AS (Watt et al., 2006b). This, in addition to meta-analytic evidence for the amenability of AS to CBT treatment (Smits et al., 2008b), meant we anticipated that the current treatment would reduce AS. Moreover, because AS has been shown to mediate anxiety and depression treatment outcome (Smits et al., 2004), we hypothesized that the present treatment would lead to decreases in anxiety and depressive symptoms.

Method

Participants

We recruited participants through notices in newspapers and posters in health, education, and community centres (February to December, 2011) advertising a research study for those with fears of anxiety-related sensations. To be eligible to participate, individuals had to be ≥18 years of age, have access to a telephone, and meet criteria for high AS, as reflected by a score of ≥23 on the Anxiety Sensitivity Index – 3 (ASI-3; Taylor et al., 2007), which is one standard deviation above the non-clinical population mean (*M*=12.8, *SD*=10.6; Reiss, Peterson, Taylor, Schmidt, & Weems, 2008). Individuals also completed Health Canada's Physical Activity Readiness Questionnaire (PARQ; Shephard, Cox, & Simper, 1981) to screen for any contraindications to physical activity (e.g., hypertension, cardiac disease) that would prohibit them from participating in the exercise (i.e., interoceptive exposure) component of treatment. If the PARQ raised concerns with an individual's suitability for physical exercise, he/she was required to secure a note from his/her doctor indicating his/her readiness for exercise to be eligible.

In addition, individuals could not be engaged in other current psychotherapy. They were permitted to be using a pharmacological intervention as long as their medication and dosage had been stable for the three months prior to treatment and remained so during the study. Finally, individuals were screened for psychosis using the Psychotic Screening Module of the Structured Clinical Interview for DSM-IV-TR (SCID; First, Spitzer, Gibbon, & Williams, 2002), and current suicidal ideation with an item from the Beck Depression Inventory – II (Beck, Steer, & Brown, 1996). The treatment under

investigation did not address these mental health concerns and thus individuals with current psychosis and/or suicidal ideation were excluded.

Overall, 182 individuals expressed interest in participating. Of those, 109 qualified for participation and 80 consented, completed pre-treatment assessment procedures, and were randomized to a treatment condition (see Figure 6.1). Characteristics of the final study sample ($N = 80$) can be found in Table 6.1 and Table 6.2. According to the baseline SCID, 33 participants (41%) presented with one current Axis I diagnosis, 23 (29%) had a primary and comorbid condition, 11 (14%) qualified for two or more comorbidities, and 13 (16%) did not qualify for a DSM-IV-TR diagnosis.

Procedure

Those who qualified for participation provided verbal informed consent over the telephone and signed a written informed consent form via mail. Participants were then randomized using an online random number generator (www.randomization.com) to either the CBT treatment condition (CBT) or to a waiting list control (WLC), but were not informed of their random assignment until after completing the pre-treatment assessment. Participants completed a self-report questionnaire by mail and a telephone-administered SCID (First et al., 2002) assessment by an interviewer blind to treatment condition. Interviewers were clinical psychology PhD students trained in SCID administration and supervised by registered psychologists. Upon completion of the telephone interview and the self-report questionnaire, participants began either the CBT or WLC condition.

All participants completed assessment measures eight and 12 weeks later to coincide with completion of the telephone therapy sessions and the interoceptive

exposure component of treatment, respectively, for those in the CBT condition. Those in the CBT condition also completed the same measures at 20 weeks. Twelve weeks after the start of both the CBT and WLC conditions, participants also completed a telephone-administered SCID (First et al., 2002) conducted by interviewers blind to participants' treatment condition. Participants were compensated with $10 gift cards to a local grocery or book store for completing questionnaires at each time point. All study procedures were approved by the relevant Research Ethics Board.

Telephone-delivered CBT.   Participants in the CBT condition received telephone-delivered CBT for high AS. Research suggests a general receptiveness to receiving psychiatric services via telephone (Grubaugh, Cain, Elhai, Patrick, & Frueh, 2008). The CBT protocol was developed from a brief empirically validated CBT intervention for high AS (Watt et al., 2006b), published as a self-help resource by Watt and Stewart (2008). Participants were mailed this book at the outset of treatment and it served as a treatment manual. Participants were assigned weekly reading and homework exercises and a therapist guided participants through the treatment by providing individualized support and feedback in weekly 50 minute telephone sessions.

The intervention was divided into an eight week program consisting of four modules. The first module included psychoeducation about AS (week 1) and how it is related to mental health problems (week 2). The second module focused on cognitive restructuring (weeks 3-4). The third module introduced interoceptive exposure (weeks 5-6); participants were asked to run/brisk walk three times per week for 10 minutes through the remainder of treatment and for four weeks after the telephone therapy sessions had concluded. Participants completed weekly interoceptive exposure tracking sheets and

were provided with a Polaris heart rate monitor to ensure they were raising their heart rate sufficiently to mimic body arousal sensations during the exposure. Finally, the fourth module focused on relapse prevention (week 7) and how individuals could extend treatment gains (week 8). Therapists were six registered psychologists and six senior clinical psychology PhD students trained in the CBT protocol by one of the authors. Students were supervised by registered psychologists during weekly one hour group supervision sessions.

Waiting list control (WLC). Participants assigned to the WLC condition did not receive any intervention. They received a check-in phone call from research personnel after four weeks, designed to encourage their continued engagement in the research study. WLC participants were invited to switch over to the CBT condition after the 12 week assessment.

Materials

Structured Clinical Interview for DSM-IV (SCID; First et al., 2002). We administered all modules of the SCID, a structured diagnostic interview, to assess for DSM-IV-TR diagnoses. Reliability estimates tend to be >.60 across disorders (Zanarini et al., 2000). The SCID has been administered successfully over the telephone (Furmark et al., 2009).

Anxiety Sensitivity Index – 3 (ASI-3; Taylor et al., 2007). The ASI-3 is an 18-item self-report measure that indexes AS, or the amount of fear an individual experiences with respect to anxiety-related body sensations. Participants indicate the extent to which they agree or disagree with each item (e.g., "It scares me when my heart beats rapidly") on a 5-point Likert scale (0 = *very little* to 4 = *very much*). Items are summed for a total

score. The ASI-3 can also be separated into three 6-item lower order subscales measuring fear of physical sensations (physical concerns), fear of psychological sensations (cognitive concerns), and fear of social consequences of anxiety sensations (social concerns). The ASI-3 has good internal reliability and criterion validity (Taylor et al., 2007). Twelve week test-retest reliability for the WLC was $r = .74$.

Panic Attack Questionnaire – IV (PAQ-IV; Norton, Zvolensky, Bonn-Miller, Cox, & Norton, 2008). We used portions of the PAQ-IV, a measure of the specific features of PD, asking participants to report the degree to which they experienced 14 panic symptoms (e.g., sweating) on a 5-point Likert scale (0 = *doesn't occur* to 4 = *very severe*); summing these items provided a PAQ-IV total score. The PAQ-IV is relatively new, however, previous versions of the PAQ have been empirically validated and the PAQ-IV has strong concurrent validity (Norton et al., 2008).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item self-report questionnaire that assesses an individual's general tendency to worry excessively – a core trait of GAD. Participants are asked to indicate on a 5-point Likert scale (1 = *not at all typical* to 5 = *very typical*) how typical of them is a statement (e.g., "I worry all the time"). Items are summed for a total score. The PSWQ has good internal consistency and test-retest reliability (Molina & Borkovec, 1994) and validity in relation to GAD (Brown, Antony, & Barlow, 1992).

Life Stressor Checklist – Revised (LSC-R; Wolfe & Kimmerling, 1997) and the **Modified PTSD Symptom Scale** (MPSS; Falsetti, Resnick, Resick, & Kilpatrick, 1993). On the LSC-R, participants were asked to indicate which, if any, of a list of traumatic events had happened to them. Those who indicated that they had experienced a traumatic

event completed the MPSS, which assesses how often participants experience a series of PTSD symptoms (e.g., "Have you had repeated or intrusive upsetting thoughts or recollections of the event?") using a 5-point Likert scale (0 = *not at all* to 3 = *5 or more times per week*) as well as how severe these symptoms were (1 = *not at all distressing* to 5 = *extremely distressing*). An overall score was calculated by summing these two subscales. Only participants endorsing a DSM-IV-TR criterion A qualifying traumatic event were included in analyses with the MPSS. Those who reported experiencing more than one traumatic event completed the MPSS thinking about the event that was currently affecting them to the greatest degree. The MPSS has shown good internal consistency and concurrent validity (Falsetti et al., 1993).

Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987). SP symptoms were measured using the LSAS. The LSAS presents 16 social or performance situations (e.g., "Calling someone you don't know very well") for which participants rate their fear (0 = *none* to 3 = *severe*) and the degree to which they avoid each situation (0 = *never* to 3 = *usually*). We created an overall SP score by summing all items. The LSAS has strong internal reliability ($\alpha = 0.95$) and good convergent and discriminant validity (Baker, Heinrichs, Kim, & Hofmann, 2002).

Depression Anxiety Stress Scales – 21 Depression Subcale (DASS-21 Depression; Lovibond & Lovibond, 1995*).* Current, non-specific symptoms of depression were evaluated using the DASS-21 Depression subscale. Individuals indicate the extent to which a particular negative emotional state (e.g., "I felt that I had nothing to look forward to") has applied to them over the past week on a 4-point scale (0 = *did not apply to me* to 3 = *applied to me very much or most of the time*). Depression subscale scores are

calculated by summing across the subscale items and multiplying by two to compare it to DASS-42 norms. The DASS-21 has good internal consistency and concurrent validity (Antony, Bieling, Cox, Enns, & Swinson, 1998).

Sheehan Disability Scale (SDS; Leon, Shear, Portera, & Klerman, 1992). Using an 11-point scale, participants rated their functional disability, or the extent to which their mental health symptoms disrupted their functioning in three domains: Work/school, family life/responsibilities, and social life. The SDS has been shown to be reliable and have satisfactory construct and criterion validity (Leon et al., 1992).

Treatment Satisfaction. To assess satisfaction with treatment, participants answered a series of open-ended questions about their experience (e.g., "What did you like best about the treatment?"). Participants also rated how satisfied they were with the treatment on a 10-point scale (10 = *very satisfied*) and whether they would recommend the treatment to a friend.

Working Alliance Inventory – Short Form Revised (WAI-SR; Hatcher & Gillaspy, 2006). The WAI-SR is a 12-item self-report measure of therapeutic alliance comprised of three subscales: (a) Agreement on the goals of therapy (e.g., "My therapist and I are working towards mutually agreed upon goals"), (b) agreement on the tasks of therapy (e.g., "My therapist and I agree on what it is important for me to work on"), and (c) the therapist-client bond (e.g., "I feel that my therapist appreciates me"). Participants responded using a 5-point Likert scale (1 = *seldom* to 5 = *always*). Overall and subscale scores are calculated by summing the appropriate items. The WAI-SR has good internal consistency and convergent and discriminant validity (Hatcher & Gillaspy, 2006).

Data Analytic Plan

To check if randomization resulted in balanced groups, differences between the CBT and WLC conditions were assessed using analysis of variance (ANOVA) and chi-squares (χ^2) in SPSS 20.0. Hypotheses were tested using multilevel modelling with HLM 7.0 software (Scientific Software International, Inc., Lincolnwood, IL). A two-level model was specified with repeated measures (level-1) nested within people (level-2). Multilevel models have numerous advantages when compared to ANOVA: (a) They handle missing data using a maximum likelihood approach, which provides more statistical power, and relatively unbiased parameter estimates when compared to listwise deletion and single imputation methods (Graham, 2009); (b) they account for the non-independence of observations associated with repeated measurement, reducing the risk of Type I error; and (c) they can accommodate unequal time periods between assessment periods (Gueorguieva & Krystal, 2004).

We estimated separate models for each of the outcome variables using restricted maximum likelihood estimation. At level 1, time was entered as a predictor: Time 1 (baseline) was coded as 0, time 2 (8 weeks) as 2, and time 3 (12 weeks) as 3 to represent the unequal amounts of time between measurement occasions. Because there were three measurement occasions, we tested a linear growth curve with random slopes and random intercepts. We also explored the possibility of quadratic growth curves using fixed slopes and random intercepts (at least four measurement occasions are required for random slopes in a quadratic growth curve; Mroczek & Griffin, 2007). At level 2, treatment group (WLC = 0 and CBT = 1) was included as a predictor. The time*group interaction

was tested by including a cross-level effect between time at level 1 and group at level 2.

Thus, the equations for linear analyses were:

Level-1 Model
$$OUTCOME_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + e_{ti}$$

Level-2 Model
$$\pi_{0i} = \beta_{00} + \beta_{01}*(GROUP_i) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}*(GROUP_i) + r_{1i}$$

And the equations for quadratic analyses were:

Level-1 Model
$$OUTCOME_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + \pi_{2i}*(QUADTIME_{ti}) + e_{ti}$$

Level-2 Model
$$\pi_{0i} = \beta_{00} + \beta_{01}*(GROUP_i) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}*(GROUP_i)$$
$$\pi_{2i} = \beta_{20} + \beta_{21}*(GROUP_i)$$

If the treatment was successful, we would expect a significant cross-level interaction.

When cross-level interactions were significant, we probed the interaction using a simple

slopes approach (Preacher, Curran, & Bauer, 2006). We used the formula provided by

Snijders and Bosker (1999) to calculate pseudo-R^2 values as a measure of effect size.

Mediated moderation was assessed using the procedure outlined by Muller, Judd, and

Yzbert (2005). This analysis will test whether the time*group interaction has an indirect

effect on outcomes through AS. We measured clinical significance by: (1) Examining

changes in functional disability in a multilevel model, (2) examining the number of SCID

diagnoses per participant as an outcome variable in a multilevel model, (3) using the

Jacobson and Truax (1991) approach for assessing clinically significant change for AS,

and (4) using paired sample t-tests to see if gains in the CBT group were maintained from

the 12 week to 20 week follow-up.

Results

Pre-Treatment Differences on Demographic Variables

The two groups did not differ significantly on sex, $\chi^2(1) = 0.67$, $p = 0.41$, age, $F(1,79) = .02$, $p = 0.88$, and use of psychotropic medication, $\chi^2(1) = 1.92$, $p = 0.17$.

Participant Dropout

Of the 80 participants randomized, 69% completed the post-treatment assessment and 74% completed the 12 week assessment. In the CBT condition, 30/40 participants completed at least six of the eight sessions and were considered "completers" as these six sessions covered the core treatment content (the last two focused on relapse prevention). Of those 30 participants, five did not return post-treatment measures and two surveys were lost in the mail. Reasons for drop out from the CBT condition were: No time for treatment (n=4), moved out of the area of licensed practice (n=2), no reason provided (n=3), and treatment was a bad fit (n=1).

Normality and Descriptive Statistics

We assessed normality of variables using a visual inspection of the shape of the distribution and an interpretation of the SPSS skew statistic using a threshold of ±1.00 as indicative of a departure from normality (Meyers, Gamst, & Guarino, 2006). The MPSS data was very positively skewed so we log transformed MPSS scores before analysis. Table 6.3 presents mean scores for each outcome variable across all three time points. Mean ASI-3 scores at pre-treatment were as high as those found in individuals with PD ($M = 32.6$) and SP ($M = 31.4$; Reiss et al., 2008). Mean LSAS scores were higher than those found in non-anxious controls ($M = 13.7$), but somewhat less than clinical samples ($M = 74.41$), falling in the "moderate to marked SP" range (Heimberg & Holaway, 2007).

PSWQ mean scores were slightly less than those in clinical samples ($M = 68.1$; Fresco, Mennin, Heimberg, & Turk, 2003). Symptom severity endorsement at an item level on the PAQ resembled that of clinical panickers (e.g., chest pain or discomfort $M = 1.64$ in our sample and $M = 1.57$ in a clinical sample; Norton et al., 2008). The mean score on the MPSS did not reach the clinical cut-off for community (≥ 46) samples (Falsetti et al., 1993). Mean DASS-21 Depression scores were lower than among individuals with MDD ($M = 29.96$) but still within the "moderate severity" range and higher than among individuals with PD ($M = 12.75$) or SP ($M = 13.19$; Antony et al., 1998).

Table 6.3 also presents correlations between study variables at pre-treatment. The ASI-3 was correlated with PAQ, LSAS, and DASS-21 Depression scores, but unexpectedly not with PSWQ or MPSS scores. There was an expected amount of intercorrelation among the anxiety measures. DASS-21 Depression scores were correlated with each of the other measures.

Multilevel Models

The coefficients for cross-level time*group interaction effects, the simple slopes separated by treatment group, and pseudo-R^2 values are presented in Table 6.4. Both linear and quadratic models were tested; we reported results for quadratic models only if the time^2*group cross-level interaction was significant at $p < .05$. When significant cross-level interactions were found, data were plotted graphically to aid interpretation (see Figures 6.2-6.4).[4]

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[4] Because time was coded 0, 2, and 3, the linear relationships may have a slight bend in the middle when graphed. This occurs because there were unequal distances between time points. Re-coding time as 0, 1, and 2 would fix this problem, but we opted against this approach to better represent the unequal time lags during analysis in the figures.

Anxiety sensitivity. The change in ASI-3 scores over time was best described as quadratic. A quadratic model with fixed slopes and random intercepts revealed a significant quadratic time*group interaction (see Figure 6.2), and the model accounted for 15.9% of the variance in ASI-3 scores. While the WLC condition showed a smaller but significant linear decrease in AS over time, the CBT condition showed a significant quadratic change, with a linear reduction in AS sharper than that of the WLC group during the first eight weeks of treatment that was maintained in the subsequent four weeks.

We also examined separate models for each of the AS subscales. There was a significant quadratic time*group interaction in predicting AS physical concerns ($B = 1.26$, $t_{78} = 2.33$, $p < .05$) that accounted for 8.1% of the variance. Simple slopes showed a small linear decrease in AS physical concerns over time for the WLC ($B = -0.53$, $t_{65} = -2.36$, $p < .05$; 2.8% variance accounted for) and significant quadratic change over time for the CBT condition ($B = 1.17$, $t_{46} = 2.59$, $p < .05$; 14.1% variance accounted for), reflecting a sharp linear reduction in AS between pre-treatment and eight weeks which is maintained at 12 weeks. For AS cognitive concerns, scores significantly decreased over time for both the CBT and WLC conditions; however, no significant linear ($B = -0.96$, $t_{78} = -1.90$, $p = .06$) or quadratic ($B = 1.08$, $t_{110} = 1.77$, $p = .08$) time*group interaction emerged. A significant linear time*group interaction emerged in predicting AS social concerns ($B = -1.07$, $t_{78} = -2.25$, $< .05$) that accounted for 25.2% of the variance. The CBT group's AS social concerns ($B = -2.04$, $t_{47} = -6.23$, $< .001$; 16.6% variance accounted for) decreased at a rate of more than twice that of the WLC group ($B = -0.96$, $t_{65} = -4.21$, $< .001$; 4.3% variance accounted for).

Panic symptoms. There was a significant linear time*group interaction (see Figure 6.3a) predicting PAQ panic symptoms. This relation was not better explained by a quadratic relation. The CBT group's panic symptoms decreased at a rate of more than twice that of the WLC group for every unit of time. The linear model accounted for 25.7% of the variance in PAQ scores.

Social phobia symptoms. There was a significant linear time*group interaction predicting SP symptoms (see Figure 6.3b). This relation was not better explained by a quadratic relation. The CBT group showed double the rate of change in SP symptoms per unit of time as compared to the WLC group. The linear model accounted for 6.6% of the variance in LSAS scores.

Posttraumatic stress symptoms. PTSD symptoms were predicted by a significant linear time*group interaction (see Figure 6.3c), and were not better explained by a quadratic relationship. PTSD symptoms in the CBT group decreased in a significant linear fashion while there was no significant change in the WLC group's PTSD symptoms over time. The linear model accounted for 8.23% of the variance in MPSS scores.

Generalized anxiety symptoms. While there was an overall main effect of time, showing that generalized anxiety significantly decreased over time for both the CBT and WLC conditions, no significant linear or quadratic group*time interactions emerged. This suggests generalized anxiety did not improve due to treatment.

Depression. There was an overall main effect of time on depression symptoms revealing a decrease in depressive symptoms over time in both the CBT and WLC groups. However, no significant linear or quadratic group*time interactions emerged,

suggesting that the intervention did not reduce symptoms of depression to a greater extent than the passing of time.

Mediation Analyses

Given our hypotheses about the role of AS reductions in decreasing mental health symptoms, we also tested for mediated moderation. Specifically, we investigated whether the time*group interaction predicts reduced AS, which in turn predicts decreased mental health symptoms. According to Muller and colleagues (2005), there need to be direct effects among variables in order to test for mediation. As such, we only tested for a mediating role of AS for panic, SP, and posttraumatic stress symptoms.

Panic symptoms. The significant time*group interaction on the PAQ was fully mediated by AS. AS was a significant predictor of panic symptoms in the model ($B = 0.38$, $p < .001$), and the time*group interaction was reduced from statistical significance ($B = -3.39$, $p < .01$) to nonsignificance ($B = -0.16$, $p = 0.91$) when AS was added as a mediator.

Social phobia symptoms. The significant time*group interaction on the LSAS was fully mediated by AS. AS was a significant predictor of SP symptoms in the model ($B = 0.60$, $p < .01$), and the time*group interaction was reduced from statistical significance ($B = -3.31$, $p < .05$) to nonsignificance ($B = 0.35$, $p = 0.86$) when AS was added as a mediator.

Posttraumatic stress symptoms. The significant time*group interaction on the MPSS was fully mediated by AS. AS was a significant predictor of PTSD symptoms in the model ($B = 0.01$, $p < .05$), and the time*group interaction was reduced from statistical

significance ($B = -0.06$, $p < .05$) to nonsignificance ($B = 0.02$, $p = 0.64$) when AS was added as a mediator.

Clinical Significance

There was a significant linear time*group interaction in predicting functional disability (see Figure 6.4a). There was a significant linear reduction in functional disability over time for both the CBT and WLC groups; however, the rate of change for the CBT group was more than double that of the WLC group. The linear model accounted for 2.7% of the variance.

There was a significant linear time*group interaction in predicting number of SCID diagnoses ($\beta = -0.17$, $t_{78} = -3.15$, $p < .01$; see Figure 6.4b). The linear model accounted for 19.6% of the variance the model. Simple slopes show a significant linear reduction in number of diagnoses over time for both groups with the CBT group showing a steeper rate of change ($\beta = -0.26$, $t_{39} = -7.20$, $p < .001$) than the WLC ($\beta = -0.10$, $t_{39} = -2.68$, $p < .05$). The linear model accounted for 6.15% of the variance for the WLC condition and 29.38% for the CBT condition.

We also identified participants in each condition whose post-treatment ASI-3 scores were closer to the normal population mean than to the dysfunctional population mean and who evidenced reliable change according to Jacobson and Truax's (1991) formula. Of the participants in the CBT group who completed the ASI-3 at the 12 week assessment, 45.8% met criteria for recovery (i.e., evidence of reliable change and ASI-3 score closer to normal population mean), another 16.7% showed clinically significant improvement (i.e., evidence of reliable change), 33.3% were unchanged, and 4.2% had deteriorated. In contrast, of the participants in the WLC group who completed the ASI-3

at the 12 week assessment, 17.6% were recovered, another 8.8% were improved, 73.5%

were unchanged, and none had deteriorated.

Finally, participants in the CBT group also completed a follow-up questionnaire

at 20 weeks. We compared values on the 12 week and 20 week follow-ups using paired

sample t-tests to see if treatment gains were maintained.. Findings show no difference in

12 week and 20 week follow-up scores for the CBT group for each of AS (t_{17} = -0.43, p =

0.68, d = 0.10), panic (t_{18} = 1.11, p = 0.28, d = 0.26), SP (t_{18} = 1.71, p = 0.11, d = 0.39),

generalized anxiety (t_{17} = 1.79, p = 0.09, d = 0.42), and depressive symptoms (t_{18} = 0.43,

p = 0.67, d = 0.10), or functional disability (t_{15} = 1.16, p = 0.26, d = 0.29). Posttraumatic

stress symptoms were significantly lower at 20 weeks than at 12 weeks (t_{16} = 4.52, p <

.001, d = 0.74) suggesting continued improvement.

Treatment Satisfaction and Therapeutic Alliance

All participants in the CBT condition reported that they would recommend the

treatment to a friend. The mean treatment satisfaction was 8.9/10 (SD = 1.1).

Qualitatively, participants reported finding the therapists understanding, caring,

supportive, helpful, and insightful, and the phone sessions and anxiety reduction

strategies learned during treatment to be helpful. Participants' responses on the WAI-SR

suggest a high degree of therapeutic alliance. The mean score on the WAI-SR was 55.48

(SD = 3.39) with mean scores of 18.50 (SD = 1.56) on the goal subscale, 19.05 (SD =

1.40) on the bond subscale, and 17.79 (SD = 1.44) on the task subscale.

When asked what was most helpful about the treatment, participants equally

endorsed each of: The phone therapy sessions, the personalized support, learning

strategies such as examining the evidence, the physical exercise, and the combination of

reading and phone therapy. All but one participant found the treatment very convenient to engage in, particularly because they did not have to leave their home and because therapists offered flexible scheduling. Only a few concerns were reported: Wanted more sessions ($n=7$), would have preferred face-to-face treatment or to see therapist's picture ($n=4$), parts of the sessions were not relevant to the individual ($n=2$), difficulty scheduling sessions ($n=2$), and parts of the treatment manual were dry, confusing, and/or too theory-based ($n=7$).

Discussion

The present study investigated the efficacy of a telephone-based CBT intervention for high AS among a community-recruited treatment-seeking sample. The primary aim was to test the intervention's efficacy in reducing high AS as compared to a WLC, while a second objective was to investigate reductions in high AS-associated mental health symptoms as a result of the treatment. Results showed that the treatment was successful in reducing AS when compared to a WLC. In line with prior research showing the susceptibility of AS to CBT (Smits et al., 2008b), AS decreased over the first 8 weeks of treatment, and these gains were maintained at 12 week and 20 week follow-ups.

As hypothesized, we also found reductions in mental health symptoms associated with high AS. Participants in the CBT group showed significantly greater reductions in panic, SP, and posttraumatic stress symptoms than participants in the WLC condition, and these gains were maintained at 12 and 20 week follow-ups. These findings were expected given previously established associations between high AS and anxiety disorders suggesting that AS might contribute to their development and maintenance (Olatunji & Wolitzky-Taylor, 2009). Moreover, mediated moderation analyses revealed

that reductions in AS mediated the changes in panic, SP, and PTSD symptoms resulting from treatment. In other words, the treatment reduced AS over time, which in turn led to decreases in panic, SP, and PTSD symptoms. Again, this finding is in line with evidence that AS might mediate the outcome of disorder-specific anxiety treatments (Arch et al., 2012; Smits et al., 2004) and transdiagnostic protocols (Sauer-Zavala et al., 2012).

Unexpectedly, depressive and generalized anxiety symptoms did not reliably decrease as a result of treatment. This may be because the intervention did not lead to reductions in AS cognitive concerns. Research suggests that the AS-depression association may be specifically due to the link between AS cognitive concerns and depressive symptoms (Cox et al., 2001; Deacon et al., 2003) to the extent that AS cognitive concerns might be a "depression-specific form of anxiety sensitivity" (Taylor et al., 1996, p. 478). Similarly, the connection between AS and generalized anxiety is likely through AS cognitive concerns, possibly due to the common fear of uncontrollable psychological symptoms (e.g., worry, difficulty concentrating; Rector et al., 2007; Rodriguez et al., 2004). Thus, we may not have seen a change in depressive or generalized anxiety symptoms due to a mismatch between the content of the intervention and the nature of the relation between AS and both depression and generalized anxiety. It may be that the interoceptive exposure component of the intervention (i.e., physical exercise) did not target AS cognitive concerns but was more relevant to AS physical concerns. A second possible reason for the lack of treatment effect on worry pertains to the lack of correlation between worry and AS at pre-treatment. While previous studies have documented a connection between AS and the PSWQ (Keough, Riccardi, Timpano, Mitchell, & Schmidt, 2010), we did not find a correlation between the PSWQ and ASI-3

at baseline, which may help explain the limited change in participants' generalized anxiety with an AS focused treatment.

As one measure of clinical significance, results showed a greater reduction in the number of SCID diagnoses for participants in the CBT group from pre- to post-treatment than those in the WLC group. This finding suggests that symptom reductions resulting from treatment were sufficient to lead to diagnostic remission. In addition to mental health symptoms, we also considered whether participants experienced an improvement in functional disability as a result of treatment as another measure of clinical significance. Participants in the CBT group endorsed a significantly greater reduction in symptom interference in their life than those in the WLC. This suggests that symptom reductions stemming from treatment had real-life implications.

Taken together, the present findings provide support for the use of CBT strategies including psychoeducation, cognitive restructuring, and interoceptive exposure to target AS as a transdiagnostic approach to mental health treatment. Like Barlow et al.'s (2011) Unified Protocol, by targeting AS as an underlying risk factor the present study resulted in symptom reductions across anxiety disorders. This treatment appears promising in helping a broad array of clients with various anxiety disorders. By targeting AS we may have a better ability to treat comorbid conditions that share AS as a common risk or maintenance factor.

In addition to the promise of transdiagnostic interventions, the present study adds to evidence of the efficacy of telephone service delivery (Hecker, Losee, Roberson-Nay, & Maki, 2004; Lovell et al., 2006). Despite the lack of face-to-face sessions, telephone-based interventions can still include all of the key components of CBT including

psychoeducation, cognitive restructuring, and exposure. Qualitative feedback collected from study participants about the telephone-based treatment was overwhelmingly positive. The majority of participants extolled its convenience and their comfort with communicating with their therapist via telephone. Participants reported finding the phone therapy sessions helpful for their personalized support and for learning useful strategies to target anxiety. Therapeutic alliance scores were also high, in line with other telephone-based treatment studies (Lingley-Pottie & McGrath, 2006), supporting the idea that an alliance based on mutual agreement of goals and tasks and a positive bond can exist between therapist and client via this treatment delivery medium.

The present study has limitations. First, analyses rely predominantly on self-report symptom measures; participants may have under- or over-reported the severity of their symptoms. Second, due to limited resources the telephone-administered SCIDs were not reviewed by a second, independent assessor; this may have introduced some degree of interviewer bias into the data. The standardized nature of the SCID does, however, attempt to control for interviewer bias. We also did not record telephone sessions to check therapist adherence to the treatment protocol. All therapists were trained in the protocol and received weekly supervision in which adherence was discussed. Future steps with this protocol should include more rigorous fidelity checks. Third, participants' appreciation of the convenience of treatment was due in part to the flexible hours offered by therapists, including evenings and weekends. This may not accurately reflect the practicalities of real-world clinical practice and might have inflated participants' positive feedback of the intervention.

A fourth limitation is the amount of missing data. Our assessment return rates were 69% at eight weeks and 74% at 12 weeks. These rates do not exactly reflect treatment completion rates; several participants completed six to eight treatment sessions without completing post-treatment assessment measures, and there was a nation-wide postal strike during the study, both of which lowered our rate of return. As such, the low rates of return are not a direct reflection of the palatability or relevance of the intervention. We addressed missing data using a maximum likelihood approach in HLM. Nevertheless, better methods to increase (a) treatment retention and (b) assessment return rates are needed. We might have improved return rates by offering the option of completing the measures online for convenience, or by shortening the questionnaire. To improve treatment retention we might consider reducing the amount of homework participants were assigned as several participants cited lack of time as a reason for withdrawal.

Despite these limitations, the present study highlights the promise of treating AS. Future studies should explore the mechanisms of action of this intervention as Sauer-Zavala and colleagues (2012) did for Barlow et al.'s Unified Protocol (2011). It might also be helpful to reformulate the present AS intervention so the exposure component of treatment better targets AS cognitive concerns in addition to AS physical and social concerns. This might mean adding exposure activities or tailoring exposure to be specific to an individual's elevated AS subscale(s). For instance, hyperventilation alone or with spiral staring or a strobe light may be useful in inducing depersonalization or derealization, both AS cognitive concerns (Lickel, Nelson, Lickel, & Deacon, 2008).

Finally, it will be important for future research to better investigate the longer-term outcomes of this treatment and its implications for AS levels over time.

Table 6.1

Participant Characteristics

Characteristic	Total Sample *N*=80	Waiting List *n*=40	Treatment *n*=40
Age at Pre-Treatment	*M*=36.3 (11.3)	*M*=36.5 (10.4)	*M*=36.2 (12.2)
Range	18-65 yrs	20-58 yrs	18-65 yrs
Sex	78.8% women	72.5% women	85% women
Taking Medication	37.5%	37.5%	37.5%
SSRI	17.6%	20.0%	15.0%
Benzodiazepine	12.6%	10.0%	15.0%
Other	14.3%	12.5%	15.0%
Marital Status			
Single	27.5%	35.0%	20.0%
Married/Common-Law	37.5%	27.5%	47.5%
Divorced/Separated/Widowed	13.8%	15.0%	12.5%
<6 month relationship	3.8%	7.5%	0.0%
>6 month relationship	17.5%	15.0%	20.0%
Education Level			
Some High School/High School/GED	13.8%	12.5%	20.0%
Trade School or Community College	17.6%	20%	15.0%
Some University/University	66.3%	67.5%	65.0%
Income*			
<$10,000	10.0%	12.5%	7.5%
$10,001 - $35,000	26.3%	17.5%	35.0%
$35,001 - $60,000	22.5%	27.5%	17.5%
$60,001 - $85,000	10.0%	10.0%	10.0%
> $85,001	26.3%	27.5%	25.0%
Ethnicity^			
Native Canadian	2.5%	2.5%	2.5%
Black or African Canadian	1.3%	2.5%	0.0%
Caucasian or Euro Canadian	76.3%	75.0%	77.5%
Asian or Asian Canadian	2.5%	5.0%	0.0%
Mixed	7.5%	2.5%	12.5%

Note. SSRI = selective serotonin reuptake inhibitor. *5% not reported. ^10% not reported.

Table 6.2

Participants' Current Primary and Comorbid DSM-IV Diagnoses

Diagnosis	Total Sample N=80	Waiting List n=40	Treatment n=40
Anxiety Disorders			
PD	17.5%	15.0%	20.0%
PD with Agoraphobia	12.5%	12.5%	12.5%
Agoraphobia	6.3%	5.0%	7.5%
SP	26.3%	25.0%	27.5%
Specific Phobia	3.8%	0.0%	7.5%
GAD	25.0%	15.0%	35.0%
PTSD	5.0%	0.0%	10.0%
OCD	5.0%	2.5%	7.5%
ADNOS	8.8%	7.5%	10.0%
Mood Disorders			
MDD	11.3%	7.5%	15.0%
Dysthymia	5.0%	7.5%	2.5%
Bipolar Disorder	1.3%	0.0%	2.5%
Cyclothymia	1.3%	2.5%	0.0%
Substance Use Disorders	3.8%	0.0%	7.5%
Somatoform Disorders			
Hypochondriasis	3.8%	5.0%	2.5%
Pain Disorder	1.3%	2.5%	0.0%
Eating Disorders	1.3%	0.0%	2.5%
Adjustment Disorder	5.0%	5.0%	5.0%
No Diagnosis	16.3%	22.5%	10.0%
Partial/Full Remission^			
Anxiety Disorder	16.3%/7.5%	5.0%/7.5%	27.5%/7.5%
Mood Disorder	15.0%/17.5%	10.0%/17.5%	20.0%/17.5%
Substance Use Disorder	2.5%/23.8%	2.5%/25.0%	2.5%/22.5%
Eating Disorder	3.8%/2.5%	5.0%/2.5%	2.5%/2.5%

Note. ADNOS = anxiety disorder not otherwise specified; GAD = generalized anxiety disorder; MDD = major depressive disorder; OCD = obsessive-compulsive disorder; PD = panic disorder; PTSD = posttraumatic stress disorder; SP = social phobia. ^Percentages reflect participants who met diagnostic criteria in their lifetime but not at pre-treatment.

Table 6.3

Means, Standard Deviations, and Correlations for Study Measures

Measure	Group	Pre M (SD)	8 Week M (SD)	12 Week M (SD)	1	2	3	4	5	6
1. ASI-3	WLC	36.83 (13.67)	31.31 (13.71)	28.56 (13.16)	.90	.34**	.05	.20	.41***	.29**
	CBT	39.93 (13.50)	23.57 (13.44)	24.54 (14.71)						
2. PAQ	WLC	17.85 (13.62)	10.42 (14.62)	8.09 (12.61)		.88	.35**	.25*	.16	.25*
	CBT	27.60 (12.18)	10.35 (12.90)	9.32 (13.98)						
3. PSWQ	WLC	61.68 (9.32)	58.74 (9.50)	58.21 (12.12)			.90	.21	.22	.30**
	CBT	62.50 (11.27)	54.91 (11.88)	53.48 (9.35)						
4. MPSS^	WLC	27.20 (31.67)	27.03 (28.80)	22.66 (28.32)				.97	.11	.38**
	CBT	38.42 (34.64)	21.00 (25.28)	24.04 (31.19)						
5. LSAS	WLC	66.97 (28.52)	60.23 (26.23)	56.25 (30.08)					.96	.36**
	CBT	62.95 (30.01)	46.09 (29.89)	45.40 (31.83)						
6. DASS-Dep	WLC	16.10 (12.63)	12.63 (11.53)	12.65 (12.39)						.93
	CBT	19.35 (12.33)	9.91 (11.00)	11.44 (11.41)						

Note. Correlations between study variables were calculated using pre-treatment values. Cronbach alphas are listed along the diagonal – they were calculated by averaging the pre-treatment, 8 week, and 12 week alphas for each variable. WLC = waiting list control; ASI-3 = Anxiety Sensitivity Index – 3; CBT = cognitive behaviour therapy group; DASS-Dep = Depression, Anxiety, Stress Scales – Depression subscale; LSAS = Liebowitz Social Anxiety Scale; MPSS = Modified PTSD Symptom Scale; PAQ = Panic Attack Questionnaire; PSWQ = Penn State Worry Questionnaire; SDS = Sheehan Disability Scale. ^MPSS mean scores are before log transformation, however, correlations were calculated using log transformed scores. *$p<.05$, **$p<.01$, ***$p<.001$.

Table 6.4

Hierarchical Linear Modeling Results

	Emotional Disorder Symptom Measures						SDS
	ASI-3	PAQ	LSAS	MPSS	PSWQ	DASS-Dep	
Time*group interaction effect							
Linear B	-12.28	-3.39	-3.31	-0.06	-1.59	-1.34	-1.93
Linear t_{df}	-3.06_{110}**	-3.23_{78}**	-2.06_{77}*	-2.21_{77}*	-1.60_{78}	-1.38_{78}	-3.28_{75}**
Quadratic B	3.13	------	------	------	------	------	------
Quadratic t_{df}	2.28_{110}*	------	------	------	------	------	------
R^2	15.87%	25.74%	6.57%	8.23%	6.07%	5.67%	2.72%
Intervention group only: time simple effect							
Linear B	-14.30	-6.56	-6.36	-0.08	------	------	-2.81
Linear t_{df}	-3.83_{46}***	-7.23_{39}***	-4.41_{38}***	-3.89_{38}***	------	------	-5.10_{36}***
Quadratic B	3.03	------	------	------	------	------	------
Quadratic t_{df}	2.35_{46}*	------	------	------	------	------	------
R^2	25.07%	35.45%	8.80%	7.57%	------	------	2.01%
Control group only: time simple effect							
Linear B	-2.36	-3.15	-2.99	-0.02	------	------	-1.00
Linear t_{df}	-3.98_{39}***	-4.89_{39}***	-3.52_{39}**	-0.85_{39}	------	------	-3.08_{39}**
Quadratic B	------	------	------	------	------	------	------
Quadratic t_{df}	------	------	------	------	------	------	------
R^2	1.46%	5.06%	5.37%	7.25%	------	------	14.03%

Note. When quadratic models are not reported, the quadratic slope with fixed slopes and random intercepts was not significant and so the linear model with random slopes and random intercept is reported instead. ASI-3 = Anxiety Sensitivity Index – 3; DASS-Dep = Depression, Anxiety, Stress Scales – Depression subscale; LSAS = Liebowitz Social Anxiety Scale; MPSS = Modified PTSD Symptom Scale; PAQ = Panic Attack Questionnaire; PSWQ = Penn State Worry Questionnaire; SDS = Sheehan Disability Scale.
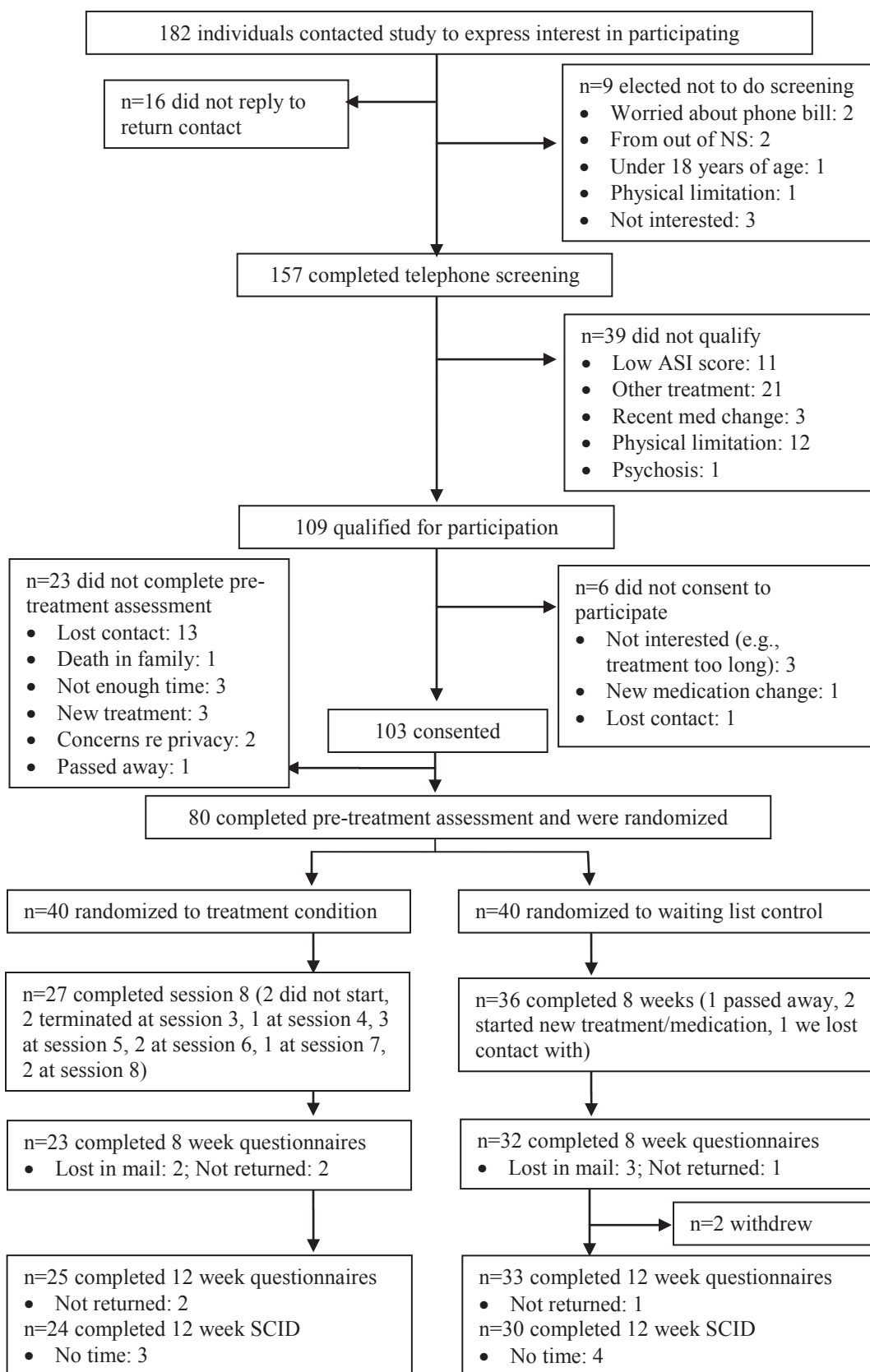*$p<.05$, **$p<.01$, ***$p<.001$.

Figure 6.1. PRISMA diagram of participant flow through the randomized controlled trial.
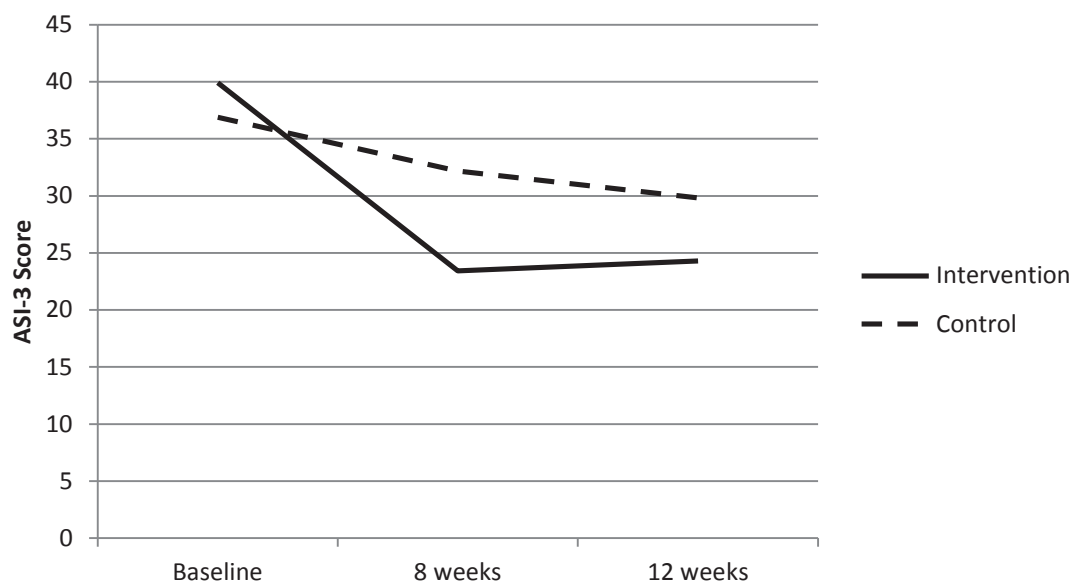
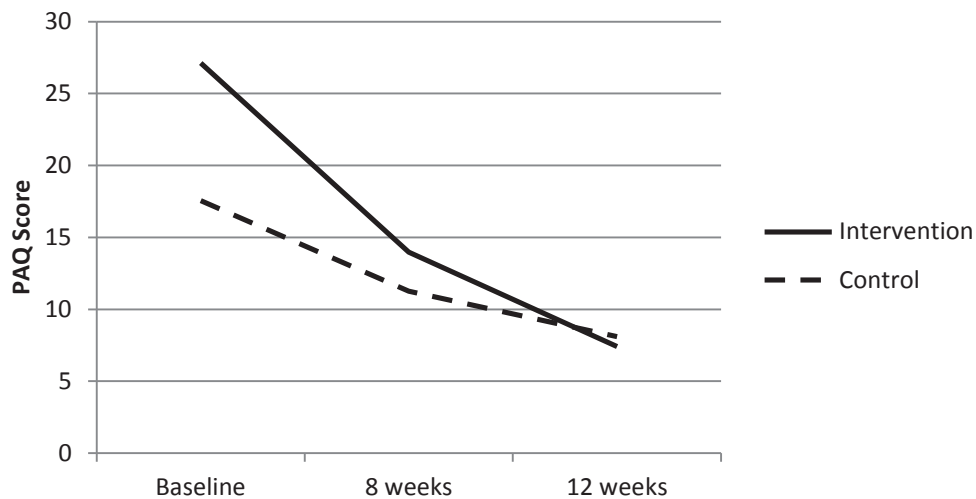*Figure 6.2*. Group*time interaction for ASI-3.

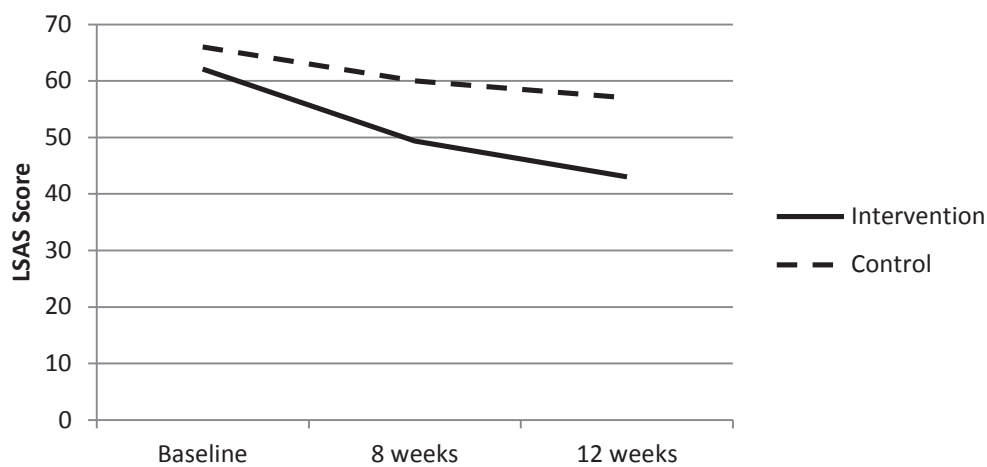*Figure 6.3a.* Group*time interaction for PAQ-IV.

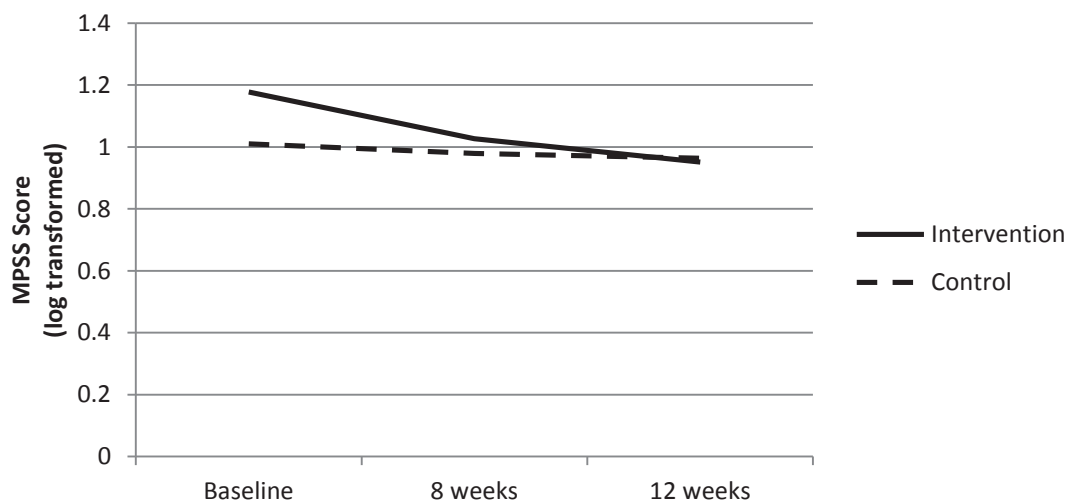

Figure 6.3b. Group*time interaction for LSAS.
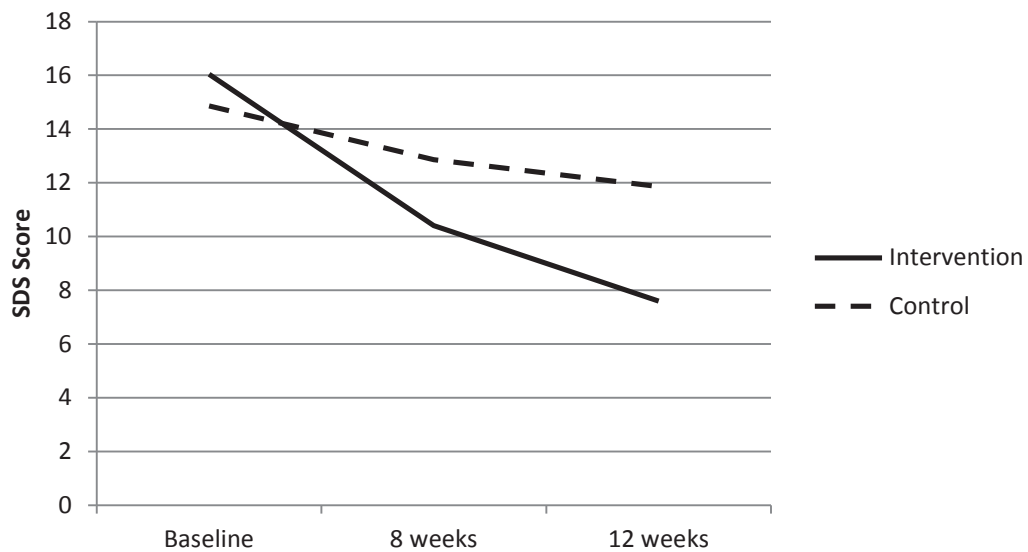

Figure 6.3c. Group*time interaction for MPSS.

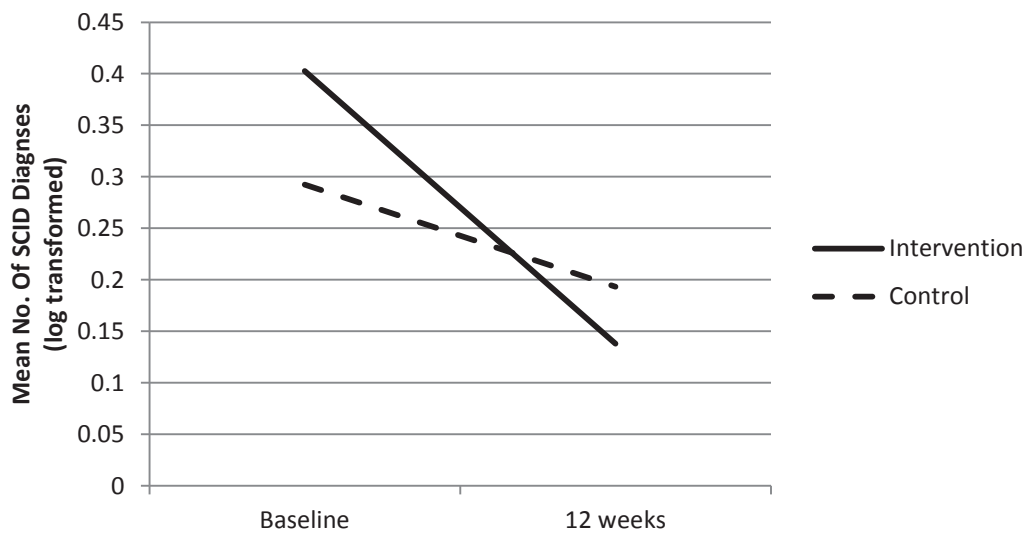*Figure 6.4a.* Clinical significance: Group*time interaction for SDS.

Figure 6.4b. Clinical significance: Group*time interaction for number of SCID diagnoses.

CHAPTER 7. STUDY 4: CBT FOR HIGH ANXIETY SENSITIVITY: ALCOHOL USE OUTCOMES[5]

Abstract

High anxiety sensitivity (AS) has been associated with greater alcohol consumption and alcohol-related problems as well as greater sensitivity to the anxiety-reducing effects of alcohol and greater risky negative reinforcement motives for drinking. The present study reported on the alcohol-related outcomes of a telephone-delivered cognitive behavioural therapy (CBT) intervention designed to reduce high AS. Eighty treatment-seeking participants with high AS (M age = 36 years; 79% women; 76% Caucasian) participated in the study and were randomly assigned to an eight week telephone CBT program or a waiting list control. Participants completed measures of alcohol consumption, alcohol-related problems, and drinking motives at pre- and post-treatment. Multilevel modeling showed the treatment was successful in reducing AS. The treatment also resulted in specific reductions in drinking to cope with anxiety motives as well as physical alcohol-related problems. The treatment did not have a significant effect on alcohol consumption rates. Mediated moderation analyses showed treatment-related changes in AS mediated changes in drinking to cope with anxiety motives in the treatment group. Changes in drinking to cope with anxiety motives mediated changes in physical alcohol-related problems. Results of the present study suggest that an AS-targeted intervention such as the present one may have implications for reducing some

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risky alcohol use cognitions and behaviours. Further research is needed in a sample of problem drinkers.

Introduction

Anxiety sensitivity (AS) is an enduring fear of arousal-related body sensations (e.g., rapid heart rate, dizziness) that arises from the tendency to interpret these physiological sensations catastrophically, believing that they will lead to terrible physical, psychological, and/or social outcomes (Reiss, 1991; Reiss & McNally, 1985). Like personality characteristics such as neuroticism, we think of an individual as having a certain level of AS. An individual with high AS who experiences a rapid heart rate might fear this sensation, believing it to be a sign of an impending heart attack. An individual with low AS, in contrast, would likely experience this sensation as unpleasant but believe it to be harmless.

Research has linked high AS to the development and maintenance of anxiety disorders and depression (Naragon-Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009). Moreover, AS mediates anxiety and depression treatment outcome (Otto, Pollack, Fava, Ucello, & Rosenbaum, 1995; Smits, Powers, Cho, & Telch, 2004). Because of its link to a variety of emotional disorders and its role as a treatment mediator, we hypothesized that AS might be an appropriate target for transdiagnostic treatment. The principle behind such interventions is that mental health disorders are manifestations of shared risk factors and core processes, such as AS, and that by targeting these underlying variables, treatment can reduce symptoms across diagnostic categories (Barlow, Allen, & Choate, 2004).

Recently, we conducted a randomized controlled trial (RCT) testing the efficacy of a telephone-delivered cognitive behavioural therapy (CBT) intervention for high AS in reducing AS as well as its associated emotional disorder symptoms. Multilevel models showed that the treatment was more efficacious than a waiting list control in reducing AS as well as panic, social phobia, and posttraumatic stress symptoms (Olthuis, Watt, Mackinnon, & Stewart, under review). In light of these promising findings, we wanted to explore whether the transdignostic implications of this treatment extended to alcohol use cognitions and behaviours. A growing body of research has linked high levels of AS to problematic alcohol use and related behaviours (Norton, 2001; Stewart & Kushner, 2001; Stewart, Samoluk, & MacDonald, 1999). Stewart, Peterson, and Pihl (1995) found that individuals high in AS report consuming more alcoholic drinks per week than those low in AS and report drinking to excess more frequently. Moreover, high AS is associated with more frequent endorsement of alcohol use problems (Watt, Stewart, Birch, & Bernier, 2006a). Longitudinal research has even shown high AS to predict the development of alcohol use disorders (Schmidt, Buckner, & Keough, 2007a).

Motivational theories of alcohol use may help explain the association between high AS and problematic alcohol use. These theories propose that specific personality characteristics (e.g., AS, harm avoidance, novelty-seeking, etc.) are associated with differential activation of brain motivation systems and differential susceptibility to certain drug reinforcement properties (Conrad, Pihl, Stewart, & Dongier, 2000; Gunnarsdottir et al., 2000). In accordance with these tenets, those high in AS may be motivated to use substances like alcohol or benzodiazepines to reduce, control, and/or avoid their fear of

aversive arousal sensations and the arousal-related physiological sensations themselves (McNally, 1996; Stewart et al., 1999).

In this respect, two key findings have emerged. First, individuals high in AS appear to be more sensitive to the anxiety-reducing effects of alcohol as compared to those low in AS (MacDonald, Baker, Stewart, & Skinner, 2000; Zack, Poulos, Aramakis, Khamba, & MacLeod, 2007). Second, AS is significantly related to negative reinforcement motives for alcohol use, including drinking to cope with negative emotions and to fit in with others (Comeau, Stewart, & Loba, 2001; DeMartini & Carey, 2011; Kushner, Thuras, Abrams, Brekke, & Sitar, 2001; Stewart, Zvolensky, & Eifert, 2001), and drinking in negative emotion situations (DeHaas, Calamari, & Bair, 2002; Reyno, Stewart, Brown, Horvath, & Wiens, 2006). The association of AS with negative reinforcement drinking motives is concerning, as these motives have been associated with problem drinking (Martens et al., 2008; Stewart et al., 1999).

Research has also shown that high AS can interfere with substance use treatment, generally by increasing the chances of dropout (Lejuez et al., 2008) and/or relapse (Zvolensky et al., 2007). Without addressing high AS in substance use treatment, individuals' fears of somatic sensations – a likely contributor to their substance use – may persist, serving as a diathesis for relapse to cope with this fear (Otto, Safren, & Pollack, 2004). This likelihood is heightened by the experience of negative physiological withdrawal sensations (Johnson, Stewart, Steeves, & Zvolensky, 2012). Recently, researchers have tried to incorporate anxiety (in general) and AS (in particular) reduction strategies into existing substance use treatment to help reduce chances of relapse (Kushner et al., 2012; Tull, Schulzinger, Schmidt, Zvolensky, & Lejuez, 2007). In

addition, personality-matched interventions that pair high AS individuals to an intervention designed to reduce AS have been successful in decreasing the risk of alcohol consumption and binge drinking rates among adolescents (Conrod, Stewart, Comeau, & Maclean, 2006).

Study Aims

Given the association of high AS with problem alcohol use and risky negative reinforcement drinking motives, and the promise of AS-targeted interventions in reducing these attitudes and behaviours, we thought it important to investigate the alcohol use outcomes of our AS-targeted CBT intervention. Comprehensive details of the RCT testing this intervention are described elsewhere (Olthuis et al., under review). In short, we recruited individuals from the community with a fear of anxiety-related sensations and randomized them to receive the intervention (CBT group) or to a waiting list control (WLC group). In the present report, we describe our comparison of the CBT and WLC participants on alcohol consumption, alcohol-related problems, and drinking motives. Prior research with a brief form of this same intervention (Watt et al., 2006a) showed decreases in problem drinking behaviours and conformity-motivated drinking among university women with high (vs. low) AS. Conrod et al. (2006) have also shown reductions in alcohol consumption among adolescents after an AS-targeted intervention. Based on these earlier findings, we hypothesized AS-focused treatment would decrease the endorsement of negative reinforcement drinking motives, alcohol consumption, and the frequency of alcohol-related problems.

Method

Participants

We used newspaper advertisements and posters in local health, education, and community centres to recruit participants. To be eligible, individuals had to: (a) be 18 years or older, (b) have access to a telephone, and (c) score ≥23 on the Anxiety Sensitivity Index – 3 (ASI-3; Taylor et al., 2007), which is one standard deviation above the non-clinical population mean ($M = 12.8$, $SD = 10.6$; Reiss, Peterson, Taylor, Schmidt, & Weems, 2008). Individuals were excluded if they (a) had contraindications to exercise (e.g., cardiac disease) that would prevent them from participating in the physical exercise interoceptive exposure component of treatment, (b) were engaged in other current psychotherapy, (c) had started a new pharmacological intervention or dose in the last three months, or (d) had current psychosis or suicidal ideation, as the treatment did not address these mental health issues.

Overall, 182 individuals expressed interest in participating. Of those, 109 were eligible for participation and 80 consented, completed pre-treatment assessment, and were randomized to a the CBT or WLC condition (M age $= 36.3$, $SD = 11.3$; 79% women; 76% Caucasian; 38% engaged in concurrent pharmacotherapy). Thirteen participants did not qualify for a current DSM-IV Axis I diagnosis, 33 had one diagnosis, and 34 had a primary and at least one comorbid condition (see Table 7.1). Details about participant flow through the study (including dropout) are presented elsewhere (Olthuis et al., under review).

Procedure

Participants were randomized to a treatment condition using an online random number generator (www.randomization.com). They were not informed of their random assignment until after completing the pre-treatment assessment. All participants completed assessment measures again eight and twelve weeks later to coincide with completion of the telephone therapy sessions and the extended interoceptive exposure, respectively, in the treatment condition.

Intervention (CBT). Participants in the CBT condition received eight weeks of telephone-delivered CBT for high AS based on a brief empirically-validated CBT intervention for high AS (Watt et al., 2006a) now published as a self-help resource (Watt & Stewart, 2008). Participants were assigned weekly reading and homework exercises from this self-help book. A therapist also provided individualized support and feedback in weekly 50-minute telephone sessions. The intervention included: psychoeducation about AS and its relation to mental health problems including substance use; cognitive restructuring; interoceptive exposure in the form of physical exercise; and relapse prevention. Participants were asked to continue the interoceptive exposure component of treatment for four weeks after the eight weeks of telephone therapy.

Waiting List Control (WLC). Participants in the WLC condition received only a check-in phone call from research personnel after four weeks that was designed to encourage their continued engagement in the research study.

Materials

Anxiety Sensitivity Index – 3 (ASI-3; Taylor et al., 2007). The ASI-3 is a self-report measure of AS, or the amount of fear one experiences with respect to anxiety-

related body sensations. Participants indicate the extent to which they agree or disagree with 18 items (e.g., "It scares me when my heart beats rapidly") on a 5-point Likert scale (0 = *very little* to 4 = *very much*). The ASI-3 can be separated into three subscales measuring fear of physical sensations, fear of psychological sensations, and fear of social consequences of anxiety sensations. Items are summed to provide an overall score of AS. The ASI-3 has good internal reliability and criterion validity (Taylor et al., 2007). Twelve week test-retest reliability for the WLC was *r* = .74.

Alcohol Consumption. Participants reported the number of times they drank alcohol in the past month and the number of drinks they consumed on a typical drinking occasion. A past month consumption score was calculated by multiplying a participant's quantity and frequency reports.

Modified Drinking Motives Questionnaire – Revised (MDMQ-R; Grant, Stewart, O'Connor, Blackwell, & Conrod, 2007). Drinking motives, or reasons for drinking alcohol, were measured using the 28-item self-report MDMQ-R. The MDMQ-R is based on a modified version of Cooper's (1994) model of drinking motives and measures social (e.g., "Because it makes social gatherings more enjoyable"), enhancement (e.g., "Because I like the feeling"), coping-with-anxiety (e.g., "Because it helps me when I am feeling nervous"), coping-with-depression (e.g., "To help me feel more positive about things in my life"), and conformity (e.g., "To be liked") motives. Participants indicate how often they drink for the reason specified in each item (1 = *never/almost never* to 5 = *almost always/always*) and a mean score is calculated for each subscale. The MDMQ-R has good test-retest reliability as well as concurrent and predictive validity (Grant et al., 2007). For example, the coping-with-anxiety scale

prospectively predicts alcohol-related problems after controlling for usual consumption levels (Grant et al., 2007). Twelve week test-retest reliabilities for the MDMQ-R subscales in the WLC ranged from $r = .70$ to .84.

Short Inventory of Problems – Recent (SIP-R; Miller, Tonigan, & Longabaugh, 1995). The SIP-R (developed from the 45-item Drinker's Inventory of Consequences, or DrInC; Miller et al., 1995) was used to assess alcohol-related problems. Participants indicated the frequency with which they experienced each of 15 problems (e.g., "I have taken foolish risks when I have been drinking") on a 4-point Likert scale. While the SIP-R typically asks participants to report on their alcohol-related problems in the past three months, for our purposes we asked participants to report on those they experienced over the past month. The SIP-R consists of the three items from each of the five subscales of the DrInC (physical, interpersonal, intrapersonal, impulse control, and social responsibility) that have shown the strongest correlation with the entire five-item subscale. Subscale items are summed to create subscale scores. The SIP-R subscale scores have modest internal consistency and test-retest reliability (Miller et al., 1995; Feinn, Tennen, & Kranzler, 2003). Twelve week test-retest reliabilities for the SIP-R subscales in the WLC ranged from $r = .36$ to .76.

Data Analytic Plan

We tested hypotheses using multilevel modelling with HLM 7.0 software (Scientific Software International, Inc., Lincolnwood, IL). A multilevel modeling approach was appropriate for our data because it: (a) accommodates unequal time points between assessments (Gueorguieva & Krystal, 2004), (b) uses a maximum likelihood approach to handle missing data, which provides more statistical power and relatively

unbiased parameter assessments in comparison to listwise deletion or single imputation methods (Graham, 2009), and (c) accounts for non-independent repeated measures observations, reducing Type 1 error risk (Garson, 2013).

A two-level model was specified with repeated measures (level 1) nested within people (level 2). We estimated separate models for each of the outcome variables using restricted maximum likelihood estimation. Time was entered as a predictor at level 1 and was coded as 0 (pre-treatment), 2 (8 weeks), and 3 (12 weeks) to capture the unequal amounts of time between assessment points. To incorporate the three measurement occasions, we tested a linear growth curve with random slopes and random intercepts and explored quadratic growth curves using fixed slopes and random intercepts (at least four measurement occasions would be required for random slopes in a quadratic growth curve; Mroczek & Griffin, 2007). Treatment group was entered as a predictor at level 2 (WLC = 0 and CBT = 1). We also tested a time*group interaction by including a cross-level effect between time at level 1 and group at level 2. Thus, the equations for linear analyses were:

Level-1 Model
$$OUTCOME_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + e_{ti}$$

Level-2 Model
$$\pi_{0i} = \beta_{00} + \beta_{01}*(GROUP_i) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}*(GROUP_i) + r_{1i}$$

And the equations for quadratic analyses were:

Level-1 Model
$$OUTCOME_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + \pi_{2i}*(QUADTIME_{ti}) + e_{ti}$$

Level-2 Model
$$\pi_{0i} = \beta_{00} + \beta_{01}*(GROUP_i) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}*(GROUP_i)$$
$$\pi_{2i} = \beta_{20} + \beta_{21}*(GROUP_i)$$

If the treatment was successful, we would expect a significant cross-level interaction. We probed significant cross-level interactions using a simple slopes approach (Preacher, Curran, & Bauer, 2006). We used the formula provided by Snijders and Bosker (1999) to calculate pseudo-R^2 values as a measure of effect size. Finally, for significant cross-level interactions, we assessed mediated moderation using the procedure outlined by Muller, Judd, and Yzbert (2005).

Results

Post-Treatment Differences on Demographic Variables

Analyses of variance and chi-squares (in SPSS 20.0) showed that the two groups did not differ on important demographic variables including sex, age, and use of psychotropic medication (see Olthuis et al., under review).

Normality and Descriptive Statistics

To assess normality we visually inspected the shape of the distribution and flagged any SPSS skew statistics over a threshold of ±1.00 as indicative of a departure from normality. We log transformed any skewed scores before analysis.

Mean ASI-3 scores at pre-treatment (see Table 7.2) were at least as high as levels found in individuals with PD ($M = 32.6$) and social phobia ($M = 31.4$; Reiss et al., 2008). Frequency of consumption rates generally match Canadian normative rates, though typical quantity of consumption on one drinking occasion was slightly elevated in the present sample (Thomas, 2012). Mean drinking motive levels are largely on par with those reported by survey undergraduate populations (Grant et al., 2007), though coping-with-anxiety motives were somewhat elevated and enhancement motives were somewhat reduced, likely reflecting the high AS experience with the physiological sensations of

alcohol use. While mindful of the discrepant time parameters of the SIP-R we used, SIP-R scores are much lower than those found among individuals seeking treatment for excessive drinking (Feinn et al., 2003) but generally similar to those from a sample of 556 Swedish university students participating in residence hall-wide alcohol use prevention programs (Stahlbrandt, Johnsson, & Berglund, 2007).

Multilevel Models

Tables 7.3a and 7.3b present the coefficients for cross-level time*group interaction effects, the simple slopes for the WLC and CBT groups, and pseudo-R^2 values. When significant cross-level interactions were found for the alcohol use variables, data were plotted graphically to aid interpretation of results.[6] Below, results are summarized for each outcome variable.

Anxiety sensitivity. When predicting ASI-3 scores, a quadratic model with fixed slopes and random intercepts revealed a significant quadratic time*group interaction, and the model accounted for 15.87% of the variance in ASI-3 scores. The WLC condition showed a small but significant linear reduction in AS over time while the CBT condition had a significant quadratic change consisting of a linear reduction in AS sharper than that of the WLC group from pre-treatment to eight weeks that was maintained from eight to 12 weeks.

Alcohol consumption. There were no significant linear or quadratic interactions for the alcohol consumption quantity*frequency variable.

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[6] Because time was coded 0, 2, and 3, the linear relationships may have a slight bend in the middle when graphed. This occurs because there were unequal distances between time points. Re-coding time as 0, 1, and 2 would fix this problem, but we opted against this approach to better represent the unequal time lags during analysis in the figures.

Drinking motives. When predicting coping-with-anxiety motives, there was a significant linear time*group interaction (see Figure 7.1), and the model accounted for 2.18% of the variance in coping-with-anxiety motives. The CBT group's coping-with-anxiety motives declined in a significant linear fashion over time while the WLC group's coping-with-anxiety motives did not significantly change. No significant linear or quadratic interactions were found for social, enhancement, coping-with-depression, or conformity motives.

Alcohol-related problems. We found a significant linear time*group interaction for physical alcohol-related problems[7] (see Figure 7.2) and a marginally significant linear time*group interaction for intrapersonal alcohol-related problems. In both cases, the CBT group's alcohol-related problems decreased over time (2.76% of variance explained for physical problems) while the WLC group's alcohol-related problems did not change (0.19% of variance explained for physical problems).

Mediation Analysis

Given our hypotheses about the role of AS reductions in reducing problematic alcohol-related behaviours, we investigated whether the time*group interaction predicts reduced AS, which in turn predicts decreases in substance use variables. Because there need to be direct effects among variables in order to test for mediation according to

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[7] At pre-treatment, the CBT group had a significantly higher SIP-R physical score than the WLC. We conducted a supplemental analysis after removing outliers from the CBT group. (We removed the three highest scores at pre-treatment, which were from two participants who did not complete eight or 12 week assessment measures and one participant who reported alcohol use problems in the past month but no alcohol use.) After removing these outliers, pre-treatment scores were no longer different between groups and the time*group interaction for SIP-R physical remained significant.

Muller et al.'s (2005) model we only tested for the mediating role of AS for coping-with-anxiety motives and physical alcohol-related problems.

Drinking motives. The significant time*group interaction predicting coping-with-anxiety motives was fully mediated by AS for the CBT group but not the WLC group. In the CBT group, AS was a significant predictor of coping-with-anxiety motives in the model ($B = 0.03$, $p <.001$), and the time*group interaction was reduced from statistical significance to not significant ($B = -0.01$, $p = 0.90$).

Alcohol-related problems. AS did not mediate the time*group interaction for SIP-R physical problems. As an exploratory question, we examined whether changes in MDMQ-R coping-with-anxiety motives mediated the time*group interaction for SIP-R physical problems. We found that coping-with-anxiety motives did mediate the interaction: coping-with-anxiety motives were a significant predictor of SIP-R physical problems in the model ($B = 0.06$, $p < .05$), and the time*group interaction was reduced from statistical significance to not significant ($B = 0.00$, $p = .99$).

Discussion

The present study investigated the substance use outcomes resulting from a telephone-based CBT intervention for high AS among a community-recruited sample seeking treatment for fear of anxiety-related sensations. Prior research has suggested that AS is associated with greater alcohol consumption (Stewart et al., 1995) and alcohol-related problems (Schmidt et al., 2007a) as well as greater sensitivity to the anxiety-reducing effects of alcohol (MacDonald et al., 2000) and greater negative reinforcement motives for drinking (DeMartini & Carey, 2011). As such, we hypothesized that a CBT

intervention designed to reduce high AS might also have implications for these alcohol-related cognitions and behaviours.

As reported previously (Olthuis et al., under review), multilevel modeling showed a significant time*group interaction when predicting high AS suggesting that, as hypothesized, the intervention significantly reduced high AS and did so to a greater degree than a WLC. AS decreased over the first eight weeks of treatment and this gain was maintained at 12 weeks. This result is in line with other studies demonstrating the efficacy of CBT interventions in reducing AS (Keough & Schmidt, 2012; Smits, Berry, Tart, & Powers, 2008b; Watt et al., 2006a).

Having found reductions in AS, changes in alcohol use cognitions and behaviours that reflected this reduction were expected. Contrary to our hypothesis, however, we found no changes in alcohol consumption over the course of treatment. The lack of impact of the intervention on alcohol consumption levels may have been due to low rates in the sample at pre-treatment. Alcohol use in the present sample may not have been clinically significant enough at pre-treatment to expect substantial reductions from AS treatment. Prior research is mixed as to the relevance of AS treatment on rates of alcohol consumption (Conrod et al., 2006; O'Leary et al., 2010; Watt et al., 2006a); thus, further investigation into this issue appears warranted.

Results did reveal a significant linear time*group interaction in predicting coping-with-anxiety drinking motives. Simple slopes showed a significant linear reduction in coping-with-anxiety motives in the CBT group as compared to no significant change in the WLC condition. The emergence of this unique interaction for coping-with-anxiety motives is notable because it reflects the specificity of the intervention under

investigation. Changes in coping-with-anxiety motives may have stemmed directly from reductions in AS as a result of the intervention, as prior research suggests that high AS is associated with negative reinforcement drinking motives including coping motives (Kushner et al., 2001; Stewart et al., 2001). In fact, in the present study we found that treatment-related AS reductions significantly mediated changes in coping-with-anxiety motives. It is also possible that reductions in anxiety symptoms associated with AS resulting from this intervention (Olthuis et al., under review) reduced the need for coping-motivated drinking. Alternatively, CBT for AS may help individuals learn more adaptive ways to cope with their feared anxiety symptoms, that they may use in place of drinking behaviour. Perhaps these three mechanisms are acting together. Reducing coping motives (particularly coping-with-anxiety motives) is important, as they have previously been linked to alcohol-related problems (Grant et al., 2007; Martens et al., 2008; Stewart et al., 1999).

No significant interactions were found for the remaining drinking motives – social, enhancement, coping-with-depression, or conformity motives. Prior testing of a brief form of this intervention has resulted in reduced conformity motives (Watt et al., 2006a). This result may not have emerged in the present study for two reasons. First, Watt and colleagues (2006) examined the intervention among college students for whom conformity-motivated drinking may be more relevant. Second, we used the MDMQ-R to measure drinking motives while Watt et al. (2006a) used the Drinking Motives Questionnaire (Cooper, 1994); these two measures have different factor structures (Grant et al., 2007).

A significant linear time*group interaction emerged for physical alcohol-related problems as did a marginally significant linear time*group interaction for intrapersonal alcohol-related problems. Simple slopes revealed a significant linear reduction in both of these subscales for the CBT group, while no significant change was found for the WLC group. These interactions may have emerged for these two subscales in particular as they may be reflective of AS physical concerns and psychological concerns, respectively. No significant interactions emerged for interpersonal alcohol-related problems. This was unexpected, given the potential relevance of interpersonal problems to AS social concerns, however, because AS tends to be associated with higher social phobia (Norton, Cox, Hewitt, & McLeod, 1997), individuals with high AS might avoid situations in which such problems would arise. Similarly, no interaction emerged for impulsivity alcohol-related problems; this was not surprising given that high AS is associated with internalizing rather than externalizing problems (Olatunji & Wolitzky-Taylor, 2009). Finally, no interaction emerged for social responsibility alcohol-related problems; again, this may be because this is not a particular area of concern for individuals high in AS and thus treatment may not have been relevant for this type of problem.

Overall, the reductions in physical and intrapersonal alcohol-related problems mirror previous work that has found a marginally significant reduction in "high consequence" drinkers among those high in AS receiving a brief AS-targeted CBT intervention (Watt et al., 2006a). Work with adolescents has also found AS focused interventions to decrease the likelihood of alcohol-related problems (O'Leary et al., 2010). While we did not find a mediating role of AS in relation to alcohol-related problems, we did find that coping-with-anxiety drinking motives mediated the reduction

in physical alcohol-related problems. This finding is in line with prior research showing a positive association between drinking to cope and experiencing alcohol-related problems (Cooper, 1994; Kuntsche, Stewart, & Cooper, 2008; Martens et al., 2008).

Results of this study should be considered in light of several important limitations. First, we relied on self-report measures and participants may have under- or over-reported the severity or frequency of their alcohol use habits. Second, participants were selected for this intervention based on their high AS as opposed to their alcohol use consumption, cognitions, and behaviours. This limited the variability in our sample, which was predominantly normative in their alcohol use cognitions and behaviours. As such, the effect of the intervention on the outcome variables needs to be investigated next using a sample of problematic alcohol users who are also high in AS to determine if the present results would be replicated or enhanced in a clinical sample. Third, our sample size was somewhat small ($n = 40$ in each group) and we were limited by the amount of missing data from study participants. While missing data was handled using a mixed effects model approach in HLM, the small sample size may have limited our ability to detect small effects. Finally, given the skew and poor reliability of some of the SIP-R subscale scores, as well as the limited variability in SIP-R subscale scores, results of the SIP-R should be interpreted with caution. Again, a replication of this study with a sample of problem alcohol users is an important next step as the SIP-R may be a more appropriate measure of alcohol problems in a problem drinking sample (Feinn et al., 2003).

Despite these limitations our findings have important clinical implications. This study adds to a growing body of research on transdiagnostic treatments suggesting that

targeting and reducing underlying risk factors for psychopathology, of which AS is just one example, can have relevance for a range of mental health symptoms, including anxiety and substance use (Farchione et al., 2012; Watt et al., 2006a). Results presented here and elsewhere (Olthuis et al., under review) show that in addition to reduced AS, the present intervention leads to decreases in coping-with-anxiety drinking motives and physical and intrapersonal alcohol-related problems, as well as panic, social phobia, and posttraumatic stress symptoms. Taken together these findings suggest that an AS-targeted intervention such as the present one, may be able to be tailored to become an efficacious way to treat comorbid anxiety and alcohol use problems. Targeting AS may be an ideal way to address an underlying vulnerability that is contributing to both substance use and anxiety problems.

Table 7.1

Participants' Current Primary DSM-IV Diagnoses

Diagnosis	Total Sample N=80	Waiting List n=40	Treatment n=40
Anxiety Disorder	67.5%	60.0%	75.0%
Mood Disorder	10.0%	12.5%	7.5%
Somatoform Disorder	1.3%	0.0%	2.5%
Adjustment Disorder	5.0%	5.0%	5.0%
Substance Use Disorder			
Current (Primary or Comorbid)	3.8%	0.0%	7.5%
Partial Remission^	2.5%	2.5%	2.5%
Full Remission^	23.8%	25.0%	22.5%
No Current Diagnosis	16.3%	22.5%	10.0%

Note. ^Percentage of participants who met criteria for a substance use disorder in partial remission at pre-treatment or who had a history of a substance use disorder in full remission at pre-treatment.

Table 7.2

Means and Standard Deviations for Study Variables

Measure	Group	Pre M (SD)	8 Week M (SD)	12 Week M (SD)
1. ASI-3	WLC	36.83 (13.67)	31.31 (13.71)	28.56 (13.16)
	PT	39.93 (13.50)	23.57 (13.44)	24.54 (14.71)
2. MDMQ-R social	WLC	2.36 (0.90)	2.45 (1.05)	2.45 (1.13)
	PT	2.64 (1.16)	2.56 (1.07)	2.37 (1.04)
3. MDMQ-R enhancement	WLC	2.09 (1.02)	1.88 (0.92)	1.82 (1.05)
	PT	2.19 (1.07)	2.08 (1.04)	1.93 (1.08)
4. MDMQ-R coping-anxiety	WLC	1.94 (0.95)	1.75 (0.88)	1.86 (1.07)
	PT	2.37 (1.14)	2.08 (1.03)	1.98 (1.16)
5. MDMQ-R coping-depression	WLC	1.35 (0.48)	1.31 (0.52)	1.23 (0.51)
	PT	1.83 (1.03)	1.60 (0.81)	1.60 (0.99)
6. MDMQ-R conformity	WLC	1.25 (0.34)	1.30 (0.52)	1.19 (0.32)
	PT	1.39 (0.72)	1.18 (0.35)	1.23 (0.55)
7. SIP-R physical	WLC	0.36 (0.91)	0.48 (0.89)	0.41 (0.98)
	PT	1.23 (1.95)	0.87 (1.52)	0.52 (1.42)
8. SIP-R interpersonal	WLC	0.21 (0.66)	0.16 (0.58)	0.22 (0.66)
	PT	0.68 (1.80)	0.39 (1.67)	0.32 (1.25)
9. SIP-R intrapersonal	WLC	0.74 (1.33)	0.45 (0.93)	0.78 (1.36)
	PT	1.50 (2.55)	0.96 (1.61)	0.72 (1.43)
10. SIP-R impulse control	WLC	0.54 (1.02)	0.26 (0.63)	0.38 (0.75)
	PT	0.93 (1.72)	0.39 (0.99)	0.44 (0.87)
11. SIP-R social responsibility	WLC	0.46 (1.00)	0.35 (0.84)	0.28 (0.81)
	PT	0.80 (1.95)	0.74 (1.48)	0.52 (1.48)
12. Quantity*frequency	WLC	20.43 (35.98)	21.70 (29.43)	17.16 (26.22)
	PT	18.58 (29.95)	25.10 (50.63)	29.47 (68.13)

Note. MDMQ-R = Modified Drinking Motives Questionnaire-Revised; PT = phone therapy; SIP-R = Short Inventory of Problems – Recent; WLC = waiting list control;. All means above are raw means (i.e., transformed data is not described above).

Table 7.3a

Hierarchical Linear Modeling Results, Part One

	ASI-3	MDMQ-R social	MDMQ-R enhancement	MDMQ-R coping-anxiety	MDMQ-R coping-depression^	MDMQ-R conformity^	Quantity* frequency^
Time x group interaction effect							
Linear B	-12.28	-0.15	-0.03	-0.15	-0.01	-0.01	0.05
Linear t_{df}	-3.06_{110}**	-1.76_{76}	-0.38_{76}	-2.21_{76}*	-0.83_{76}	-1.15_{76}	1.53_{78}
Quadratic B	3.13	------	------	------	------	------	------
Quadratic t_{df}	2.28_{110}*	------	------	------	------	------	------
R^2	15.87%	------	------	2.18%	------	------	------
Intervention group only: time simple effect							
Linear B	-14.30	-0.08	-0.08	-0.17	-0.02	-0.01	0.04
Linear t_{df}	-3.83_{46}***	-1.38_{47}	-1.54_{47}	-3.22_{47}**	-1.94_{47}+	-1.95_{47}+	1.44_{47}
Quadratic B	3.03	------	------	------	------	------	------
Quadratic t_{df}	2.35_{46}*	------	------	------	------	------	------
R^2	25.07%	------	------	1.11%	------	------	------
Control group only: time simple effect							
Linear B	-2.36	0.06	-0.07	-0.02	-0.01	0.00	-0.01
Linear t_{df}	-3.98_{39}***	1.20_{67}	-2.14_{67}*	-0.70_{67}	-2.12_{67}*	-0.88_{67}	-0.83_{65}
Quadratic B	------	------	------	------	------	------	------
Quadratic t_{df}	------	------	------	------	------	------	------
R^2	1.46%	------	------	0.03%	------	------	------

Note. When quadratic models are not reported, the quadratic slope with fixed slopes and random intercepts was not significant and so the linear model with random slopes and random intercepts is reported instead. ASI-3 = Anxiety Sensitivity Index – 3; MDMQ-R = Modified Drinking Motives Questionnaire – Revised. *p<.05, **p<.01, ***p<.001; ^Scores have been log transformed to address skew.

Table 7.3b

Hierarchical Linear Modeling Results, Part Two

	SIP-R physical^	SIP-R inter- personal^	SIP-R intra- personal^	SIP-R impulse control^	SIP-R social responsibility^
Time x group interaction effect					
Linear B	-0.05	-0.03	-0.03	-0.01	0.00
Linear t_{df}	-2.63_{77}*	-1.54_{77}	-1.75_{77}+	-0.61_{77}	0.09_{77}
R^2	n/a[1]	------	------	------	------
Intervention group only: time simple effect					
Linear B	-0.04	-0.03	-0.04	-0.03	-0.01
Linear t_{df}	-2.84_{47}**	-2.09_{47}	-2.26_{47}*	-1.62_{47}	-0.80_{47}
R^2	2.76%	------	------	------	------
Control group only: time simple effect					
Linear B	0.00	0.00	0.00	-0.02	-0.01
Linear t_{df}	0.33_{66}	-0.19_{66}	-0.37_{66}	-1.25_{66}	-1.34_{66}
R^2	0.19%	------	------	------	------

Note. Quadratic models are not reported, as the quadratic slopes with fixed slopes and random intercepts were not significant. SIP-R = Short Inventory of Problems – Recent. *$p<.05$, **$p<.01$, ***$p<.001$, +$p\leq.08$; ^Scores have been log transformed to address skew. [1]A calculation error arose in this case as it sometimes does with pseudo-R^2 values; this is more likely to occur when a small amount of variance is explained and random slopes are used.
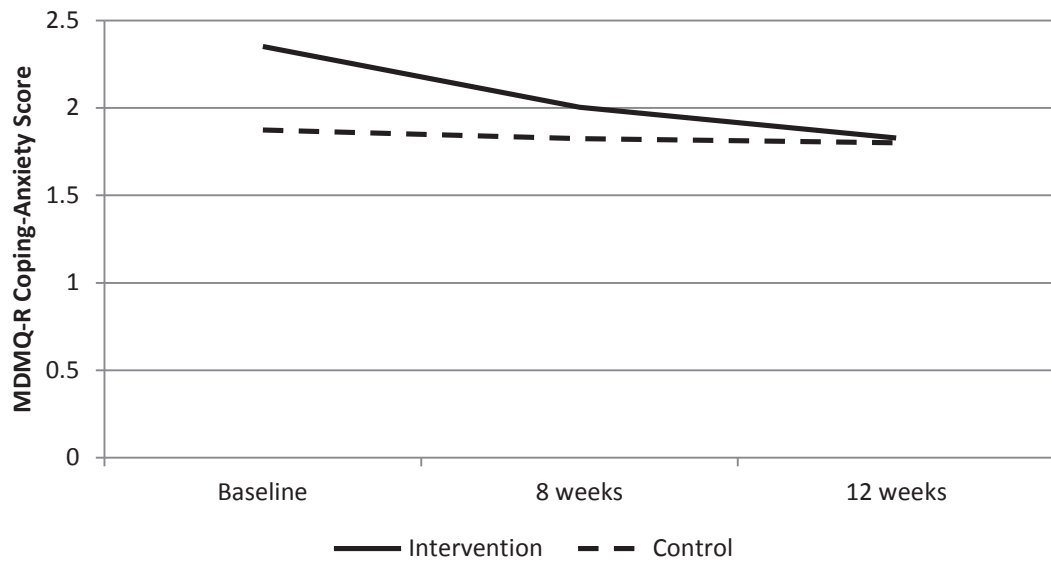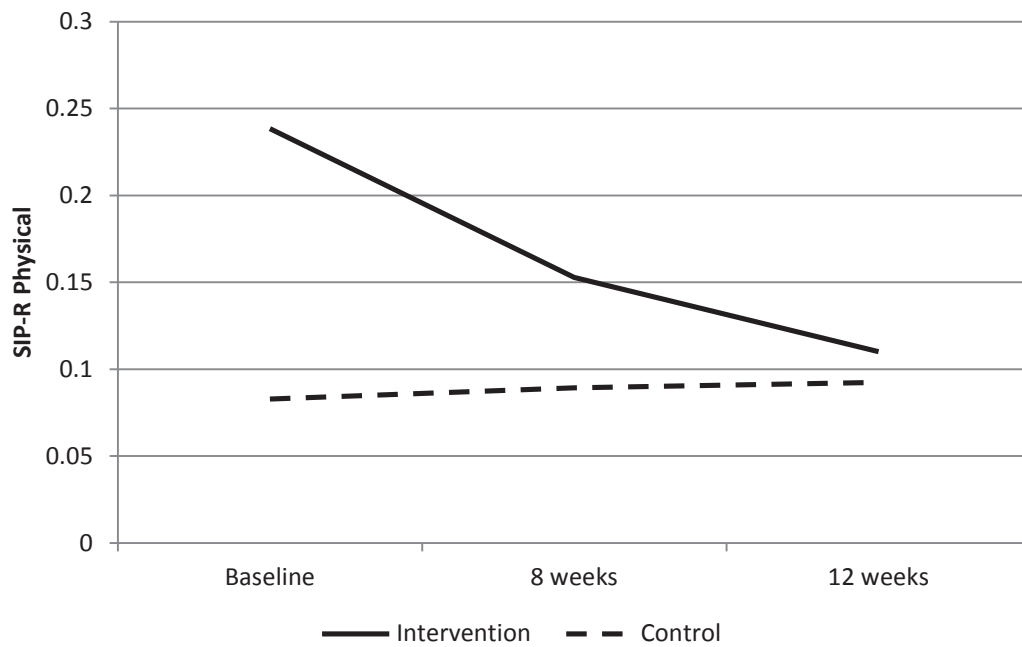
Figure 7.1. Group*time interaction for MDMQ-R coping-with-anxiety motives.

Figure 7.2. Group*time interaction for SIP-R physical subscale.

CHAPTER 8. GENERAL DISCUSSION

The overarching objective of the four studies included in this dissertation research was to investigate opportunities to improve anxiety disorder treatment accessibility and efficacy. The high prevalence of anxiety disorders (Alonso & Lépine, 2007; Kessler, Chiu, Demler, & Walters, 2005b; Slade, Johnston, Oakley Browne, Andrews, & Whiteford, 2009), in combination with low rates of service utilization (Kohn, Saxena, Levav, & Saraceno, 2004; Roberge, Fournier, Duhous, Nguyen, & Smolders, 2011), suggest the existence of a number of barriers or obstacles to treatment that are impinging on the productive alignment of need and services. Evidently, exploring methods to help improve this disparity is an important avenue for research. The aims of the studies included in this dissertation were, thus, to review the efficacy of distance, therapist-supported cognitive behavioural therapy (CBT) for anxiety disorders (Study 1), to explore the suitability of anxiety sensitivity (AS) as a target of transdiagnostic treatment (Study 2), and to test the efficacy of a distance-based CBT intervention for high AS on reducing AS and its associated mental health symptoms (Studies 3 and 4).

Summary of Findings

Before discussing the implications, limitations, and future directions of this dissertation research, a brief review and integration of the studies' findings is warranted.

Study 1: Therapist-Supported Distance CBT for Anxiety Disorders in Adults

The aim of Study 1 was to explore methods for overcoming several of the practical barriers to treatment accessibility (e.g., distance from services, transportation problems; Collins, Westra, Dozois, & Burns, 2004). Specifically, we investigated whether CBT delivered over a distance (i.e., by some combination of telephone, email,

videoconferencing, the Internet, and/or printed materials) and supported by a therapist was efficacious in treating anxiety disorders in adults. To do this we conducted a systematic review including a meta-analysis of existing studies of distance therapist-supported CBT interventions for anxiety. In line with our hypotheses, results showed that, compared to a waiting list control, distance therapist-supported CBT was significantly more efficacious in reducing general and disorder-specific anxiety symptoms and improving quality of life. Moreover, participants receiving distance therapist-supported CBT were significantly more likely to reach diagnostic remission post-treatment than those in a waiting list control.

Findings from Study 1 also showed that distance therapist-supported CBT was as efficacious in reducing disorder-specific and general anxiety symptoms as traditional, face-to-face individual or group CBT at post-treatment and six to 12 months later. Similarly, there was no difference between distance therapist-supported CBT and face-to-face CBT in the likelihood of diagnostic remission post-treatment or at six to 12 month follow-up. The only discrepancy in outcomes between the two conditions was that distance CBT resulted in significantly higher quality of life post-treatment and at six to 12 month follow-up as compared to face-to-face CBT. Satisfaction with distance delivered, therapist-supported CBT, as reported in the review's included studies, was uniformly high, and on par with that reported for face-to-face CBT. The palatability and efficacy of distance therapist-supported CBT as evidenced in our systematic review suggests it may indeed by a worthy pursuit in efforts to increase treatment accessibility for those in need.

Study 2: ASI-3 Subscales Predict Unique Variance in Anxiety and Depressive Symptoms

Having determined that distance delivery of CBT for anxiety was a feasible and efficacious option, I next considered ways to overcome some of the treatment efficacy barriers to accessing interventions. The aim of Study 2 was to investigate the suitability of AS as a target for transdiagnostic treatment by examining the association of AS with anxiety and depressive symptoms. In particular, we explored the unique associations between the AS lower-order factors – physical, cognitive, and social concerns – and panic, social phobia, generalized anxiety, posttraumatic stress, and depressive symptoms among a community-recruited, treatment-seeking sample. We used the Anxiety Sensitivity Index – 3 (ASI-3; Reiss, Peterson, Taylor, Schmidt, & Weems, 2008) to measure AS because its factor structure more reliably measures the lower-order factors of AS than the original Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992).

Largely as hypothesized, results showed AS was correlated with each of the anxiety and depression symptom measures with the exception of the measure of generalized anxiety. Moreover, unique associations between the AS subscales and emotional disorder symptoms were identified. Multiple regression analyses showed that AS physical concerns predicted unique variance in panic symptoms, AS cognitive concerns predicted unique variance in depressive symptoms, and social phobia was predicted by AS social concerns. There were also suggestions of possible associations of AS cognitive concerns with social phobia and posttraumatic stress symptoms. Somewhat unexpectedly, generalized anxiety symptoms were not associated with any of the AS subscales. For the most part, these findings are in line with prior research (Naragon-

Gainey, 2010; Olatunji & Wolitzky-Taylor, 2009) and theoretical considerations linking AS to each of these mental health problems (Clark, 1986; Cox, Borger, & Enns, 1999; Taylor, 2004). The relevance of AS to a range of emotional disorder symptoms suggests it may have promise as a target for transdiagnostic treatment.

Study 3: Telephone-Delivered CBT for High Anxiety Sensitivity: A Randomized Controlled Trial

The aim of Study 3 was to combine the two previous avenues of research (i.e., on distance treatment and the potential for AS to be a target for treatment) into an investigation of distance-based CBT for high AS. The goal was to test if a telephone-delivered CBT intervention (developed from Watt & Stewart, 2008) could reduce high AS as well as the anxiety and depressive symptoms associated with high AS. In other words, we hoped to discover if an intervention targeted at an underlying risk factor for psychopathology (i.e., AS) could have implications for reductions in symptoms across diagnostic categories. To do this, we randomized 80 treatment-seeking individuals from the community to either receive the intervention or to a waiting list control group.

Multilevel models revealed that, as hypothesized, the intervention successfully reduced AS when compared to a waiting list control (WLC), and that these gains were maintained up to 20 weeks after starting treatment. Results also showed that the intervention reduced symptoms of panic, social phobia, and posttraumatic stress as well as participants' functional disability. Moreover, we tested moderated mediation and found that changes in AS resulting from the intervention accounted for the changes in panic, social phobia, and posttraumatic stress symptoms. In other words, changes in AS served as a mediator of treatment outcome. While there was a main effect of time for

generalized anxiety and depressive symptoms, there was no group*time interaction, suggesting that the intervention did not reduce these symptoms significantly more than awaiting treatment on a waitlist. Qualitatively, treatment satisfaction reported by participants, including satisfaction with the telephone delivery method, was high. These outcomes suggest that AS-targeted interventions may indeed have transdiagnostic implications and may help treat comorbid anxiety conditions in an integrated fashion.

Study 4: CBT for High Anxiety Sensitivity: Alcohol Use Outcomes

Study 4 is an extension of the work conducted in Study 3. In addition to exploring the transdiagnostic implications of AS-targeted treatment on anxiety and depression, we also wanted to investigate alcohol use outcomes. A growing body of research has linked high AS to frequent and excessive alcohol use (Stewart, Peterson, & Pihl, 1995), endorsement of risky negative reinforcement drinking motives (Stewart, Zvolensky, & Eifert, 2001), a sensitivity to the anxiety-reducing effects of alcohol (MacDonald, Baker, Stewart, & Skinner, 2000), and even the development of alcohol use disorders (Schmidt, Buckner, & Keough, 2007a).

Unexpectedly, multilevel models revealed that the intervention did not have an effect on alcohol consumption. This may have been due to normative rates of alcohol use among participants at pre-treatment. Multilevel models did, however, show a significant linear group*time interaction for physical alcohol-related problems and a significant linear group*time interaction for coping-with-anxiety drinking motives (none of the other drinking motives were significantly changed by the intervention), showing a significant decrease over time in these variables in the CBT group but no change in the WLC group. AS mediated the changes in coping-with-anxiety motives, while coping-with-anxiety

motives mediated the changes in physical alcohol-related problems. The reduction in coping-with-anxiety motives is important as it reflects the specificity of the intervention and its ability to target negative anxiety coping strategies. Given the relatively normative levels of alcohol use in the present sample, the results of this study need to be replicated with problematic alcohol users. Nevertheless, the findings of Study 4 are generally consistent with previous findings (e.g., Watt, Stewart, Birch, & Bernier, 2006a) and provide evidence of implications of AS treatment beyond emotional disorder symptoms.

Integration of Study Findings

Taken together, the results of the four studies in this dissertation highlight two potentially important ways to increase access to and efficacy of anxiety disorder treatment. First, results support the efficacy of using distance-based CBT to increase access to interventions for those who otherwise face obstacles to seeking traditional face-to-face psychotherapy. Second, findings show that an AS-targeted intervention can have transdiagnostic implications, reducing symptoms associated with AS across diagnostic categories. This might be a useful approach to improving treatment efficacy for those with comorbid symptoms or conditions that share AS as an underlying development and/or maintenance factor.

Clinical Implications, Limitations, and Directions for Future Research

Given the treatment outcome nature of the studies included in this dissertation, it is not surprising that results stemming from the series of studies have implications for several important clinical issues. In the pages that follow, I have discussed a number of these implications as well as avenues for future research stimulated by these issues. In addition, while many of the limitations that characterize the studies included in this

dissertation research were addressed in each of the individual manuscripts, there are some additional over-arching limitations that warrant mention here. As with clinical implications, some of these limitations also point to potential directions for future research.

Clinical Implications for Distance Service Delivery

Findings from our systematic review of distance therapist-supported CBT for anxiety disorders mirror those from a number of existing meta-analyses on similar topics in the area (e.g., computer therapy for anxiety and depression, Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Internet-based psychotherapy for mental health problems, Barak, Hen, Boniel-Nissim, & Shapira, 2008; remote psychotherapy for anxiety and depression, Bee et al., 2008; Internet-based CBT for health problems, Cuijpers, van Straten, & Andersson, 2008; computer-aided psychotherapy for anxiety, Cuijpers et al., 2009; computer CBT for depression and anxiety, Kaltenthaler, Parry, & Beverley, 2004; Internet- and computer-based CBT for anxiety, Reger & Gahm, 2009; Internet-based CBT for anxiety and depression, Spek et al., 2007). These reviews all touch on somewhat distinct yet overlapping areas of distance treatment, making any overarching conclusions about its efficacy difficult. Nevertheless, the superiority of distance CBT over a no treatment control condition and its comparable efficacy with traditional, face-to-face CBT in treating a variety of mental health and health problems seem to be re-occurring themes in meta-analytic findings. Indeed, together, these meta-analyses summarize a growing body of evidence suggesting that distance-based service delivery is a warranted pursuit. In addition to its outcome efficacy, distance treatment

also appears to be an effective method for reducing some of the main barriers to treatment access (Rochlen, Zack, & Speyer, 2004).

Expectedly, research is moving in the direction of distance delivery at a more rapid rate than practice. It would be remiss, however, not to note that new examples of distance-based interventions are increasingly being implemented in public and private health care. A few examples are: (a) Strongest Families – a telephone- and Internet-based treatment program for disruptive behaviour disorders and anxiety disorders for children and their families based in Canada (McGrath et al., 2011), (b) Beating the Blues – an Internet-based CBT for depression and anxiety program out of the United Kingdom (Cavanagh et al., 2006), and (c) E-Couch – an Australian Internet-based program for anxiety and depression (Christensen et al., 2010). These programs tend to mix therapist delivery and self-help to varying degrees; our focus here has been on therapist-supported interventions. Despite the accumulating body of positive research evidence, practitioners and researchers still have questions and concerns about distance treatment and its ability to meet clients' needs. Here I discuss some of these concerns and the implications of this dissertation's findings for these issues.

Role of the therapist. First, researchers and practitioners have raised questions about the feasibility of developing a therapeutic (or working) alliance between client and therapist when remote communication technologies are being used to connect therapist and client (Cook & Doyle, 2002). Therapeutic alliance is widely considered a non-specific therapy factor that is associated with psychotherapy outcome, though the exact nature of this association (i.e., does alliance contribute to outcome or is alliance an artifact of symptom improvement) is not completely understood (Horvath, Del Re,

Fluckiger, & Symonds, 2011; Lambert & Barley, 2002). In distance treatment, it would be typical for clients to never see their therapist in person and for there to be less therapist contact than in face-to-face treatment; evidently, these characteristics make it less obvious how a strong therapeutic alliance could develop when treatment is delivered at a distance. Haas et al. (1996) argued that therapists might have difficulty understanding clients without access to visual and body language cues and expressions and that therapists might have trouble conveying empathy without face-to-face contact. Mozer et al. (2008) suggested that clients might perceive distance-based interventions to be less important than face-to-face treatment and thus be less invested. Nevertheless, researchers have postulated that because expectations and agreements on tasks and goals are still an important part of distance treatment, and because distance therapists still provide encouragement, support, and guidance to clients, the development of an alliance remains possible (Andersson et al., 2012b).

Findings from Study 3 suggest that a strong therapeutic alliance can exist when conducting telephone-delivered CBT. Mean scores on the Working Alliance Inventory Short Form Revised (WAI-SR; Hatcher & Gillaspy, 2006) and its subscales (goal, bond, and task) were high, and qualitative feedback from participants described therapists as understanding, caring, helpful, and supportive. Our results are in line with other studies that have found high levels of therapeutic alliance in Internet- and telephone-based treatments, levels that are often comparable to those reported in face-to-face treatment (Cook & Doyle, 2002; D'Arcy, Reynolds, Stiles, & Grohol, 2006; Kiropoulos et al., 2008; Lingley-Pottie & McGrath, 2006; Lingley-Pottie & McGrath, 2007; Reese, Conoley, & Brossart, 2002). Frueh et al. (2007a) also found identical levels of therapist

ratings of "good" to "excellent" rapport and empathy in a group treatment for posttraumatic stress disorder (PTSD) delivered via videoconferencing or face-to-face.

While it seems evident then, that a therapeutic alliance can develop during distance treatment, the role of the alliance in treatment outcome is less clear. For instance, Andersson and colleagues (2012b) examined working alliance in three Internet-based CBT investigations for anxiety and depression and found that while reported alliance was high in all three studies, it was not associated with treatment outcome. This finding may be specific to Internet-based CBT due to the off-line (i.e., not real-time) nature of therapist contact. In contrast, two studies of Internet-based CBT for PTSD (Knaevelsrud & Maercker, 2007; Wagner, Brand, Schulz, & Knaevelsrud, 2012) found that alliance scores were positively associated with treatment outcome. This question could not be investigated in Study 3 due to ceiling effects on the therapeutic alliance measure. Despite this remaining uncertainty, research does not support the contention that (a) therapeutic alliance cannot develop in distance treatment, or (b) a lack of therapeutic alliance is detrimental to distance treatment outcome. As such, this concern should not be an obstacle to the dissemination of distance treatment approaches.

A second important question about the role of the therapist in distance-based treatment has to do with the amount of therapist involvement (Andersson, 2009). In particular, what is the ideal amount of therapist involvement to optimize treatment outcomes? Is frequency of contact even a relevant consideration? Unlike the more standard 50-minute appointment in face-to-face interventions, in distance treatment there tends to be more varied amounts of therapist involvement. In some treatments delivered via videoconferencing or the telephone, such as the intervention we investigated in

Studies 3 and 4, the amount of therapist contact is equivalent to face-to-face treatment;

the therapist delivers CBT as usual, simply using a non-traditional service delivery

method (Frueh et al., 2007b; Lovell et al., 2006). However, oftentimes, and particularly in

Internet-based interventions, the amount of therapist contact is significantly reduced as

compared to face-to-face interventions (Carlbring, Ekselius, & Andersson, 2009).

It is important to note that we distinguish here between therapist-supported

distance interventions and self-help interventions that individuals can pursue

independently via printed materials or the Internet. While the latter type of treatment

strategies have been successful in treating anxiety (Haug, Nordgreen, Ost, & Havik,

2012), research is less clear about the comparable efficacy of entirely self-help versus

therapist-supported distance treatment. For instance, Berger and colleagues (2011)

compared the efficacy of unguided (i.e., self-help) versus therapist-guided Internet-based

CBT for social phobia and found that both types of treatment were equally efficacious in

social phobia symptom reduction. Furmark and colleagues (2009) explored the same

question and found similar results; however, they found larger effects sizes in the

therapist-guided Internet-based CBT condition as compared to the unguided condition

and that only in the former condition did symptoms significantly improve from post-

treatment to follow-up. In line with Furmark et al.'s (2009) finding, a meta-analysis of

Internet-based interventions for anxiety and depression (Spek et al., 2007) found much

larger effects for Internet-based interventions with therapist support versus a control

condition ($d = 1.00$) as compared to unguided Internet-based interventions versus a

control condition ($d = 0.24$). As such, it seemed premature to combine an investigation of

the effects of self-help and therapist-supported CBT for anxiety in one review; hence our

decision to focus on therapist-supported distance treatment in our systematic review in Study 1.

If we consider the importance of frequency of therapist contact in therapist-supported distance CBT, the small amount of existing research has focused largely on Internet-based interventions, as they tend to be the most likely to have reduced frequency of contact. One meta-analysis has found a significant positive correlation ($r = 0.75$) between therapist contact in minutes and between-group effect size in studies of Internet-based treatment of anxiety and depression (Palmqvist, Carlbring, & Anderssson, 2007). Andersson (2009) suggested that there might be a cut-off in terms of frequency of therapist contact below which there are smaller effects and more dropout (e.g., Christensen, Griffiths, Mackinnon, & Brittliffe, 2006). Other work has shown that the frequency of therapist contact in distance treatment does not seem to impact alliance ratings (i.e., more frequent contact does not lead to better alliance; Klein et al., 2009).

We ran subgroup analyses as part of our systematic review, grouping studies of all types of distance treatment according to the amount of therapist contact with participants into three categories: low (≤90 minutes), medium (91-299 minutes), and high (≥300 minutes). In most cases, meta-analytic results did not change when these subgroup analyses were run, suggesting that the amount of therapist contact did not change the finding that distance CBT was more efficacious than a waiting list and equally as efficacious as face-to-face CBT in treating anxiety. There were only two exceptions in which it was, unexpectedly, the high therapist contact group for which the outcome changed: (1) high therapist contact distance CBT was not more efficacious than a waiting list in reducing general anxiety symptoms, and (2) high therapist contact distance CBT

was less efficacious than face-to-face CBT in reducing disorder-specific anxiety symptoms. Neither of these findings suggest that less therapist contact in distance treatment would impinge on the efficacy of CBT in treating anxiety. Ultimately, discovering the ideal amount of therapist contact to balance treatment efficacy and cost-effectiveness in distance treatment remains a task for future research.

Adherence to exposure. Some clinicians have expressed the concern that the exposure components of CBT may not be adequately delivered via distance methods. Traditionally, we emphasize the importance of in-session exposure in terms of demonstrating how to conduct exposure correctly without engaging in safety behaviours. Furthermore, it could be argued that distance-based treatment might reinforce avoidance of social contact (e.g., social phobia) or of feared situations (e.g., agoraphobia; Andersson, 2009). Indeed, Andersson and colleagues (2007) emphasized that one of the main differences in face-to-face vs. distance-based treatment is that in the latter exposures are done by individuals themselves and not with a therapist in the office or in real-life situations. This was a concern shared early on by researchers, who decided to integrate live, face-to-face exposure sessions with the distance-based treatment (Andersson et al., 2006).

However, as research has progressed these concerns have lessened. This is largely because research has shown distance treatment without live exposure (e.g., Carlbring et al., 2007; Swinson, Fergus, Cox, & Wickwire, 1995; Titov, Andrews, Schwencke, Drobny, & Einstein, 2008a) to be just as efficacious at that with live exposure in treating anxiety. For instance, Tillfors and colleagues (2008) did not find higher within-group effect sizes for distance treatment with live exposure vs. distance treatment without live

exposure. Andersson and colleagues (2009) also suggested that distance treatment offers some benefits to clients in terms of exposure; for instance, clients are provided with written materials (typically more than a face-to-face client might receive) explaining exposure which they can review at anytime. Moreover, exposures are more likely to be conducted in the client's own environment, possibly increasing their generalizability as compared to exposures conducted in the therapist's office (Andersson et al., 2009).

In the randomized controlled trial in Studies 3 and 4 in the present dissertation we used standard steps for including exposure exercises in the intervention. The rationale for exposure was described in the treatment manual and discussed with clients by telephone therapists. Therapists and clients conducted cognitive restructuring exercises for exposure-related worries and discussed what to expect from the exposure exercises. Therapists also discussed the use of safety behaviours with clients (as is done in many other distance treatment studies; e.g., Berger et al., 2011), and explained how such behaviours would interfere with the effectiveness of the exposure; for instance, the use of personal music-playing devices while engaging in exposure was strongly discouraged. Anecdotally, therapists reported that their clients were well-prepared to undertake exposure exercises independently. In the sessions following the start of exposure exercises, clients were asked to recount their experience, allowing therapists to infer clues as to the clients' engagement in the exposure and/or use of safety behaviours. Trouble-shooting to increase adherence to exposure was part of the intervention protocol.

Given the physical exercise nature of the exposure included in Studies 3 and 4, exposure was also tracked at a more concrete level by asking participants to wear heart rate monitors while conducting exposure. Based on participants' age, therapists

calculated participants' target heart rate range for exposure (i.e., 60-80% of their maximum heart rate) and instructed participants to try to keep their heart rate in that range during the exposure activity. By maintaining a high heart rate, participants were more likely to experience feared physical arousal-related body sensations. Participants completed weekly exposure tracking sheets, recording their resting, average, and ending heart rates, and a short version of the Hyperventilation Questionnaire (Rapee & Medoro, 1994) to track the physical symptoms they experienced during the exposure.

Evidently, even with this type of exposure tracking system in place, the therapist relies largely on client report to assess whether exposures are being done correctly. Moreover, not all exposure activities are conducive to an exposure tracking system such as the one described here. Nevertheless, this is one way clinicians might attempt to supplement client report with physical evidence when assessing exposure engagement. Clinicians might also consider the use of third person observers and/or recorded videos to assess engagement in exposure. At the same time, studies that have not used such involved tracking systems (such as the large majority of the studies included in the meta-analysis in Study 1) continue to show positive results of treatment, suggesting that individuals are able to engage in exposure independently as part of distance-based treatment to the same extent as they are able in face-to-face treatment.

Ethical considerations. Expectedly, delivering treatment to clients by a non-traditional means raises some new ethical considerations (Barak et al., 2008; Brenes, Ingram, & Danhauer, 2011; Taylor & Luce, 2003). We encountered some of these ethical situations in the process of conducting the randomized controlled trial for Studies 3 and 4; for example, the identification and care of individuals in crisis or expressing suicidal

ideation or intent becomes somewhat more difficult in the course of distance treatment. Identification of at-risk individuals may be complicated by the lack of facial and body language cues from clients that are available in face-to-face therapy, by the less frequent contact with clients, and/or by non-real-time therapist contact in the case of Internet-based treatment (Carlbring & Andersson, 2006). In the case that the therapist is some distance from the client, intervention with identified at-risk individuals might be complicated by the therapist's inaccessibility to the client or by their unfamiliarity with the client's mental health and medical resources in their community.

In Studies 3 and 4, we followed recommendations by Carlbring and Andersson (2006) to attempt to avoid these situations by screening out potentially at-risk individuals at the study recruitment and enrollment stage. We used an item from the Beck Depression Inventory (Beck, Steer, & Brown, 1996) to identify those at-risk for suicide during assessment and screening. Individuals who endorsed suicidal ideation or intent were not eligible for study participation, were contacted by telephone by one of the licensed psychologists for further in-depth assessment, and then referred to mental health resources depending on the severity of the assessed risk. Researchers also recommend continued risk assessment through the course of treatment, the development of a safety plan, identification of a secondary means of communication, and collecting family physician details from each client to be used in the event of an emergency (Brenes et al., 2011; Carlbring & Andersson, 2006).

A second ethical consideration that arose in the course of Studies 3 and 4 had to do with the role of licensing boundaries and distance-based treatment. In Canada and the United States, legal guidelines permit psychologists only to practice in the province or

state where they are licensed. In other words, psychologists must be licensed where the therapy is being provided. Typically, geographical realities mean that clients will pursue face-to-face treatment in their immediate vicinity; thus, these rules have not often been challenged. However, distance treatment creates an opportunity to cross state/provincial and licensing boundaries in delivering client care and thus may incite more frequent clashes between licensing rules and clients' pursuit of treatment. Moreover, we must now consider where the therapy is being 'provided'. Is it where the therapist sits or where the client sits?

In our randomized controlled trial (Studies 3 and 4) we had to exclude several interested out-of-province individuals and had to terminate participation for several individuals who moved out of the province during the course of the study. Currently, only a few provisions exist that make allowances for out-of-state/province practice. In the United States and Canada, some states and provinces offer a temporary license or the opportunity to be licensed in two states/provinces, though this can be a somewhat costly endeavour for psychologists. In light of other ethical issues (e.g., addressing emergency situations, as described above), the limits to cross-border care seem warranted. On the other hand, the opportunity that distance treatment provides, for example, for a therapist to continue to treat clients who travel frequently for work or take vacation and wish to continue their sessions, may warrant renewed consideration of rules surrounding the boundaries of licensed practice.

Distance treatment also introduces new considerations about client privacy. On the one hand, telephone-based treatment can increase client privacy as clients can engage in treatment from inside their own home. However, telephone treatments might also

include: (a) the use of mobile phones and concerns about unsecured phone connections (Mozer et al., 2008), (b) the necessity to confirm that the person you're speaking to on the phone is in fact your client (Heron & Smyth, 2010), and (c) the unlikely but possible consideration of the implications for privacy of sessions in the case of wiretaps (Koocher, 2007). Moreover, Internet-based treatments create new concerns about the privacy of clients in email communications as well as their activities on online therapy websites. Practitioners must be careful to use password protection and encryption for online programs and email (e.g., Tillfors et al., 2008) while at the same time ensuring clients recognize that confidentiality can be protected but cannot be guaranteed in these unstable online environments (Taylor & Luce, 2003). Some of the concerns raised by the use of technology to communicate might have somewhat readily available solutions (e.g., the use of a password between client and therapist to ensure the therapist is speaking with their client on the telephone) while others will continue to be risks (e.g., susceptibility of email communication) that need to be addressed with the client in informed consent discussions before beginning treatment (Brenes et al., 2011; Koocher, 2007).

A fourth ethical consideration in distance treatment is the therapist's inability to control the external environment during therapy (Brenes et al., 2011). We encountered this situation when delivering telephone-based treatment. For example, several therapists reported occasions when clients were multi-tasking during their therapy sessions – for instance, by doing the dishes or cleaning the house. In other cases, clients would be in public settings (e.g., the grocery store, on the bus) when they received their scheduled telephone therapy telephone calls. These situations could be problematic because they could (a) interfere with clients' engagement with the treatment material, or (b) complicate

participants' privacy (Haas et al., 1996). We found that most participants were receptive to setting clear guidelines about engaging in treatment in the privacy of their home and with their full attention on sessions; however, even after such discussions, these situations continued to arise with some clients. This is certainly an issue for practitioners to be aware of, if they pursue distance treatment options.

Palatability of treatment. Another reason to limit the dissemination of distance-based treatments would be if individuals did not find them a desirable or acceptable means of service delivery. However, the literature does not support this concern, instead suggesting that there is a willingness to pursue distance-based services among the general population. In a study of telephone-based treatment among individuals with PTSD, Grubaugh and colleagues (2008) found that those in both urban and rural areas were generally receptive to using the telephone as a way to receive psychiatric services. Similarly, in a qualitative review of computerized, including Internet-based, CBT programs, Titov (2007) reported that individuals seem to hold generally positive perceptions of this type of treatment as well. Results of Studies 1, 3, and 4 are in line with these findings, showing high levels of treatment satisfaction following distance-based CBT and very few concerns about the method of service delivery.

Despite these positive attitudes toward distance-based treatment, there is not a universal acceptance for this type of care. Ultimately, treatment credibility is an important consideration; in other words, do clients believe the treatment will be effective for them? Some research has shown higher perceptions of treatment credibility toward face-to-face as opposed to distance treatment (Carlbring et al., 2005), though research is variable in terms of showing an effect of treatment credibility on treatment outcome

(Carlbring et al., 2006; Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001).

Moreover, there may be certain populations that are less receptive to distance-based care

as well as particular mental health problems (e.g., personality disorders, suicidal ideation)

and/or degrees of severity of symptoms (i.e., more severe symptoms) that are less easily

accommodated by distance treatment (Andersson, 2009; Rochlen et al., 2004). The focus

on distance-based interventions in this dissertation is not intended to suggest that distance

treatment is appropriate for everyone or should fully supplant traditional face-to-face

services. There will always be a place for and importance of face-to-face CBT.

Nevertheless, the extant literature does suggest a general receptiveness to distance-based

care by the broader population.

Clinical Implications of Anxiety Sensitivity as a Target of Transdiagnostic

Treatment

While the idea of reducing AS through psychotherapy is not a new one (Smits,

Barry, Tart, & Powers, 2008b), and other researchers have proposed the feasibility of

transdiagnostic treatments (Barlow, Allen, & Choate, 2004) and shown that AS

reductions can have implications for mental health symptoms (Castellanos & Conrod,

2006; Watt et al., 2006a; Watt, Stewart, Lefaivre, & Uman, 2006b), the studies included

in this dissertation are some of the first to test an AS-targeted intervention with the

express purpose of exploring its transdiagnostic implications. The results of Studies 3 and

4 in this dissertation are evidence of the promise of AS-targeted transdiagnostic

interventions. There are, however, some considerations to be made in pursuing this type

of clinical intervention.

Stability of anxiety sensitivity. It is not uncommon for AS to be conceptualized as a personality characteristic or dispositional variable. For instance, Castellanos and Conrad (2006) framed AS as a personality risk factor/trait, along with negative thinking, impulsivity, and sensation seeking, to be targeted in their personality matched alcohol interventions. Similarly Naragon-Gainey and Watson (2011) explored AS as a personality correlate of social anxiety along with other traits such as perfectionism and curiosity. In fact, along with negative and positive emotionality and negative evaluation sensitivity, AS features as a personality trait in Kotov and colleagues' (2007) trait predictor model for anxiety symptoms. Indeed, AS does seem to share characteristics with other personality variables in that it exists to different degrees within different individuals and influences their interaction with the external and internal world.

Conceptualizing AS as a personality or dispositional characteristic, however, calls into question its stability and amenability to treatment. It is generally widely acknowledged that personality characteristics, both normal and disordered, tend to be stable over time (Ferguson, 2010) and can interfere with anxiety and depression treatment outcome (Hansen, Vogel, Stiles, & Gotestam, 2007; Souery et al., 2007). With this in mind, one might wonder whether AS is in fact a good candidate for treatment or if it will remain stable despite efforts at its reduction.

Research on the stability of AS over time suggests that there is both some stability and some fluctuation in scores. Two studies of non-clinical samples showed that the cross-time correlation between AS scores measured approximately one year (Zavos, Rijsdijk, & Eley, 2012) and seven months (McLaughlin & Hatzenbuehler, 2009) apart was .47. Similarly, another study measured AS levels in adolescents yearly for four years

and found correlations between AS levels at each time point to range from .31 to .54 (Weems, Hayward, Killen, & Taylor, 2002). Among this group of adolescents, Weems et al. (2002) also identified four different patterns of AS change over time: a stable low group, a stable high group, an escalating group, and a fluctuating group. The variability in patterns of AS change over time within this sample suggest that AS levels may not be as stable as their dispositional conceptualization suggests.

A growing body of research suggests that AS is, in fact, amenable to treatment. Smits and colleagues (2008b) conducted a review of 24 CBT outcome studies that included AS as an outcome variable and found a large effect of treatment on AS for treatment-seeking samples and a moderate to large effect for at-risk samples. For the most part, the studies included in their meta-analysis were not focused on AS treatment but measured reductions in AS as a secondary outcome of anxiety or depression treatment. More recently, researchers have begun examining the efficacy of AS-specific treatments, with findings showing AS reductions resulting from several different treatment approaches (Keough & Schmidt, 2012; Schmidt et al., 2007b; Smits et al., 2008a; Vujanovic, Bernstein, Berenz, & Zvolensky, 2012; Watt et al., 2006a,b).

The results of Study 3 in the present dissertation provide added support to the amenability of AS to treatment. In Study 3, an eight week CBT intervention resulted in a significant reduction in AS when compared to a waiting list control. The reduction in AS was clinically significant for 62.5% of participants in the treatment condition who completed post-treatment assessment measures. Moreover, reductions in AS were maintained at a 20 week follow-up. These findings add to the body of literature suggesting that, while conceptualized as a dispositional variable, AS levels are malleable.

However, studies of the longer-term outcomes of AS-targeted treatments are needed before any conclusions can be reached. It is unclear if treatment gains would be maintained over a longer period of time or if AS levels would rebound to their original heights, as their conceptualization as a dispositional characteristic might suggest.

On a broader level, one might also consider that while research suggests that personality traits are relatively stable without intervention (Ferguson, 2010), perhaps they are amenable to change with effective targeted approaches. While notoriously challenging to treat, intervention research in recent years has shown some promise in terms of developing effective treatments for personality disorders, such as dialectical behaviour therapy for borderline personality disorder (Bloom, Woodward, Susmaras, & Pantalone, 2012). With this in mind, it is possible to also consider that the conceptualization of AS as a personality or dispositional characteristic is in fact accurate and it is instead our conceptualization of personality characteristics as impossible to change that requires reevaluation. This, however, is a discussion beyond the scope of this dissertation.

While research has evidently shown an amenability of AS to treatment, it should be noted that several studies have shed light on the instability of AS following structured assessment or repeated measurement over time without intervention. In other words, AS levels have decreased over time without any intervention other than assessment. In one study of high AS at-risk-for-panic participants, participants reported on their AS levels and then half received a detailed diagnostic assessment and the other half did not (Maltby, Mayers, Allen, & Tobin, 2005). Two weeks later, AS was measured again. The authors observed that those who completed the assessment reported significantly lower

AS scores while AS scores of those who did not complete the assessment were unchanged. They are not the only ones to observe this effect; other studies have shown reductions in AS in no-treatment groups that have put post-control AS levels on par with post-intervention AS levels (Gardenswartz, & Craske, 2001). Broman-Fulks and colleagues (2009) have also shown that repeated measurement of AS itself without any intermediary treatment has also resulted in reduced AS beyond what would be expected from simple regression to the mean or exposure to information about AS. Taken together, these findings suggest there may be some measurement issues with respect to AS. While research overwhelmingly supports that AS can be reduced by treatment, there remains a need for careful interpretation of AS scores and how we attribute any changes in these scores over time or following an intervention. With respect to the present findings (i.e., Study 3), because the treatment group's AS scores changed significantly more than waiting list group's AS scores we can confidently interpret the changes in AS as being treatment-driven rather than the result of regression to the mean or repeated assessment effects.

Targeting the whole or its components. Having established that AS does appear to be amenable to change, the present research raised the question about whether to target AS as a whole or to target each of its component parts in an AS-focused transdiagnostic intervention. As discussed in Study 2, AS is composed of three lower-order factors – physical, psychological, and social concerns – reflecting the type of arousal sensations and anticipated consequences an individual fears (Taylor, 1999). The results of Study 2 show that there are unique associations between each of these lower-order factors and the symptoms of different anxiety and mood disorders. We interpreted this finding as an

indication that AS would be a useful target for transdiagnostic treatment; in other words, we anticipated that due to its links with a variety of anxiety and depressive disorders, reducing AS would have implications for these associated mental health symptoms.

We thus designed a treatment with the goal of reducing global AS and its associated symptoms in mind, and included components in the treatment that would target AS as a whole. Targeting AS as a whole is a standard approach to AS treatment. We drew on prior research in the design of this treatment, particularly by our research team (Watt et al., 2006a, b; Watt & Stewart, 2008), but also by Smits and colleagues who have shown that exercise is an efficacious intervention for high AS (Smits et al., 2008a). As a result, we incorporated aspects of psychoeducation, cognitive restructuring, and interoceptive exposure to arousal-related body sensations in the form of physical exercise into the treatment program.

Despite our best, evidence-driven efforts to create an AS-focused intervention, the results of Study 3 suggest that the intervention, while showing significant effects for overall AS, did not target each of the components of AS. In particular, while AS physical and social concerns were significantly reduced following treatment, AS cognitive concerns did not change significantly as a result of treatment. One possible hypothesis for this lack of finding is that AS cognitive concerns may not be as amenable to treatment as AS social and physical concerns. However, there is nothing theoretically distinct about cognitive concerns, as compared to social and physical concerns, that supports this hypothesis. An alternative, and more plausible, hypothesis is that our particular treatment did not adequately target AS cognitive concerns. This may be for several reasons. First, AS cognitive concerns, such as worries about losing control of one's thoughts or being

"spaced out", may be more difficult for individuals to verbalize or explain to therapists as compared to physical and social concerns which are more easily named by clients. Because of this, AS cognitive concerns may not be discussed enough in treatment as often or in-depth as the more obvious and easily expressed physical and social AS concerns. Second, our focus on physical exercise as the interoceptive exposure component of treatment likely did not induce enough psychological symptoms of arousal to provide sufficient behavioural exposure to AS cognitive concerns.

Regardless of the reason for the lack of change in AS cognitive concerns, the importance of targeting each of the AS lower-order factors in order for an AS-targeted intervention to truly have transdiagnostic implications is illustrated by findings in Study 3. In Study 3, generalized anxiety and depressive symptoms did not show an effect of treatment. Prior research has suggested that the link between AS and generalized anxiety (Rector, Szacun-Shimizu, & Leybman, 2007; Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004) as well as the link between AS and depression (Carleton, Abrams, Asmundson, Antony, & McCabe, 2009; Cox, Enns, & Taylor, 2001; Taylor, Koch, Woody, & McLean, 1996) seem to operate through AS cognitive concerns. The present findings from Study 2 also support a unique connection between AS cognitive concerns and depressive symptoms. Thus, it seems probable that our treatment did not have transdiagnostic implications, as expected, for symptoms of these two disorders because we were not successful in reducing AS cognitive concerns.

Taken together, this speaks to the importance of treating all components of AS if the goal is for AS reductions to have transdiagnostic implications. While we did not incorporate interoceptive exposure exercises specific to AS cognitive concerns into the

treatment we investigated, such strategies do exist and could readily be included in AS treatment. Lickel and colleagues (2008) describe a number of exercises including hyperventilation alone or with spiral staring or a strobe light that are effective in inducing depersonalization and derealization, for example. It will be important for future research to test an intervention that comprehensively targets each of the AS components in order to further investigate the transdiagnostic implications of treating AS.

Methodological Limitations

First, as is true of many treatment outcome studies, there may be a problem with sample bias in this dissertation research. For the studies in this dissertation (including many of the investigations reviewed in Study 1), participants were recruited from the broader community rather than from within a clinical setting. Because participants responded to advertisements and elected to participate, this suggests that participants were open to the possibility of being randomized to a distance treatment, or perhaps were eager for this type of care. As such, findings supporting the efficacy of distance treatment should be interpreted with the caveat that these treatments are efficacious for those interested in/open to this type of treatment and may not be true for all individuals with high AS, anxiety, depression, and/or alcohol use problems (Berger, Hohl, & Caspar, 2009; Carlbring et al., 2006; Cuijpers, Donker, van Straten, Li, & Andersson, 2010; Kiropoulous et al., 2008).

Moreover, recruitment methods may have influenced the severity of the samples both in the studies reviewed in Study 1 and in our randomized controlled trial. For instance, studies reviewed in Study 1 that required an initial face-to-face assessment may have had an overrepresentation of low severity clients with the possibility that high

severity clients would not come in for the assessment (Carlbring, Ekselius, & Andersson, 2003). On the other hand, distance treatment studies, like that in Studies 3 and 4, which do not require any face-to-face contact may have been appealing to a particular severely impaired segment of the population who prefer to seek treatment via non-face-to-face methods (e.g., severe social phobia samples; Berger et al., 2009) or who do not want to leave their homes (e.g., agoraphobia samples; McNamee, O'Sullivan, Lelliott, & Marks, 1989). In such cases, the generalizability of treatment findings is questionable. Ultimately, more effectiveness studies are needed to determine if these type of distance treatments can work as part of a regular clinical setting (Andersson, Cuijpers, Carlbring, & Lindefors, 2007; Kaltenthaler et al., 2005). This will perhaps provide the field with better information on what types of clients are the most suited for distance treatment (Rochlen et al., 2004).

In addition to a possible sample bias, participant characteristics also create a second limitation that pertains to Studies 2, 3, and 4. Specifically, these studies are limited because the sample was not entirely above diagnostic thresholds; participants were recruited from the community and a portion of the participants were simply high in AS and did not qualify for a DSM-IV-TR diagnosis. Sample size issues prevented a separate examination of the research questions in these two different groups of participants (i.e., above vs. below diagnostic thresholds). Future research is needed to determine if an AS-targeted intervention would be as efficacious in reducing AS and its associated mental health symptoms in a sample in which everyone met diagnostic criteria. A specific examination of the role of the AS-targeted intervention explored in Studies 3 and 4 in a clinical problem drinking sample is also warranted. While

preliminary analyses in Study 4 suggest that the intervention may have some important implications for alcohol use cognitions and behaviours, because the sample did not include many problem drinkers the outcomes of this particular intervention in a problem drinking sample remain unknown. AS-focused interventions have previously been successful in changing alcohol and other substance use behaviors among substance abusers (Conrod et al., 2000) supporting the exploration of the present AS-targeted intervention in such a sample.

A third limitation to the research in this dissertation is that the role of comorbidity in both distance treatment and AS-focused interventions is insufficiently addressed. In Study 1, we did not consider the role of comorbidity (if any) in treatment outcome of distance-based CBT for anxiety. A majority of the studies reviewed included participants with comorbidities in their samples but did not report on comorbid symptom outcome. In Study 2, the varied nature of disorders and comorbidities in the sample may have complicated our interpretation of the unique relations between specific AS lower order factors and types of anxiety and depressive symptoms. We attempted to control for comorbidity by including comorbid symptom measures as control variables in our analyses; however, a more stringent approach to uncovering the unique AS subscales – anxiety/depressive symptoms relations might be to use participants who are "pure" in terms of diagnostic status (i.e., only qualify for one Axis I diagnosis). Of course, such research would be difficult to conduct since comorbidity is the norm rather than the exception. Finally, in Studies 3 and 4, we posited one of the advantages to AS-targeted treatment might be in its ability to target comorbid conditions which shared AS as an underlying factor, however, we were only able to consider this from a self-report

symptom perspective rather than with objective diagnostic assessment data. This limitation arose because only 43% of participants had a comorbid condition; after accounting for missing data, the sample size prevented a comprehensive analysis of treatment-related changes in clinical comorbidities. We did, however, find a significantly greater decrease in total number of DSM-IV-TR diagnoses per participant in the treatment as compared to the waiting list group, suggesting that the treatment may be effective in targeting comorbidities. Future research should take a closer look at the impact of AS-targeted interventions on comorbid conditions to build on the findings of Study 3.

The amount of attrition in the randomized controlled trial (Studies 3 and 4) is a fourth limitation to this dissertation research. It is somewhat difficult to define attrition in Studies 3 and 4 given the difference between the number of participants not considered treatment completers (i.e., did not complete the waiting list or at least six of eight treatment sessions; 18% attrition) and the number of participants from whom we did not receive the eight (31%) or twelve week assessment measures (26%). Other distance-based studies, particularly those of Internet-based CBT, have also found high levels of attrition (Andersson et al., 2008). As two examples, Carlbring et al. (2003) had attrition rates of 27% and 18% in their distance CBT and distance applied relaxation interventions, respectively, and Tillfors and colleagues (2008) reported that 51.4% of participants in their study of distance treatment for social phobia did not complete all of the intervention modules. In fact, Eysenbach (2005) identified high rates of attrition as one of the common problems of e-Health applications. Telephone-based interventions, like the one in Studies 3 and 4, have shown both very low rates of attrition (3%; Lovell et

al., 2006) as well as rates similar to Studies 3 and 4 (28%; Hecker, Losee, Roberson-Nay, & Maki, 2004).

The evidence of low attrition in other distance studies (e.g., Lovell et al., 2006) is proof that lower levels of attrition than those we achieved are possible. Andersson and colleagues (2008) reported that one of the most common reasons for not completing treatment is a lack of time – a response which participants also reported in Study 3. Though similar to standard CBT protocols, the requirements of the treatment investigated in Studies 3 and 4 were somewhat time-demanding of participants. Participants were asked to read one to three chapters a week from a treatment manual, complete weekly exercises in the treatment manual as homework, and engage in interoceptive exposure activities three times per week. Prior research suggests that homework is an important contributor to treatment efficacy (Mausbach, Moore, Roesch, Cardenas, & Patterson, 2010). However, it can only be helpful for a client if he or she does the assigned homework. Thus, it might be helpful to reexamine the treatment protocol with the intention of finding the ideal balance between reducing the amount of homework and maintaining treatment efficacy. In addition, the assessment measures used in the present study were also quite lengthy, requiring the completion of a comprehensive questionnaire battery and structured interview at multiple time points. This may have contributed to low return rates even among participants who completed the treatment protocol. Previous studies have also suggested that demanding assessment procedures significantly decreased the number of individuals interested in participation (Berger et al., 2009). Reducing participant burden by shortening the assessment procedure might increase retention of participants. Finally, it should also be noted that we had to deal with an

unexpected postal strike during the study and a number of participants' questionnaires were lost in the mail; again, due to lengthiness of the questionnaire battery, participants were not often willing to re-complete the assessment.

A final methodological limitation lies in our measurement of AS. AS was assessed at the same time points as the other outcome variables – pre-treatment and then eight and 12 weeks later. This method allowed us to assess treatment-related changes in AS as well as the mediating role of AS in anxiety symptom treatment outcome according to Muller and colleagues' (2005) method of testing for mediation. Nevertheless, this method is not the ideal strategy for testing mediation; a preferred method would be to assess weekly treatment gains in AS (for an example of such an assessment method, see Furmark et al., 2009) and assess the temporal relation between AS changes and anxiety symptom changes resulting from treatment using this data. Without such a research pursuit, several hypotheses for the transdiagnostic implications of AS treatment remain: (1) the treatment reduced AS which in turn reduced associated anxiety symptoms; (2) the treatment reduced AS but also reduced reactivity to and increased coping with AS-related worries (i.e., the skills learned in treatment) which also accounted for reductions in associated anxiety symptoms (Sauer-Zavala et al., 2012); or (3) the general cognitive restructuring and exposure components of treatment reduced both AS and associated anxiety symptoms. Moreover, a weekly assessment of AS would also allow for the identification of the important mechanisms of change or key ingredients of this AS-targeted intervention. For instance, researchers might be able to identify the relative importance of cognitive restructuring as compared to interoceptive exposure in reducing

AS, or the length after which additional interoceptive exposure no longer produces related decreases in AS. These are all important directions for future research.

Conclusion

The main novel contribution of this dissertation research was the exploration of ways to improve the accessibility and efficacy of anxiety disorder treatment to help address obstacles to care. The most important findings were that: (1) distance therapist-supported CBT is better than a waiting list control and as efficacious as face-to-face CBT in treating anxiety disorders, (2) there are unique and specific associations between the psychometrically sound Anxiety Sensitivity Index – 3 subscales and anxiety and depressive symptoms, suggesting that AS might be a promising target for transdiagnostic treatment, and (3) that AS-targeted telephone-delivered CBT (versus a waiting list control) is successful in (a) reducing high AS and associated panic, social phobia, and posttraumatic stress symptoms, (b) improving the likelihood of diagnostic remission, (c) reducing coping-with-anxiety drinking motives and alcohol-related problems in the physical domain, and (d) ameliorating functional disability. Overall, the results of this dissertation strongly support the use of distance-based and AS-targeted transdiagnostic treatments in overcoming barriers to treatment of anxiety and related disorders.

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*denotes studies included in Study 1 meta-analysis.

APPENDIX A

Ongoing Studies

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Clark, D. M. (2012, August). Internet-based cognitive therapy for social anxiety disorder [ISRCTN95458747]. www.controlled-trials.com.

Greist, R., & Kobak, K. (2012, January). Computer assisted cognitive behavior therapy for obsessive-compulsive disorder: A comprehensive stepped-care approach [NCT01522287]. ClinicalTrials.gov.

Nordgren, L. B., Andersson, G., Kadowaki, A., & Carlbring, P. (2012). Tailored internet-administered treatment of anxiety disorders for primary care patients: Study protocol for a randomised controlled trial. *Trials, 13,* 16. doi: 10.1186/1745-6215-13-16

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Shalev, A. Y. (2009, April). Prevention of post-traumatic stress disorder by telephone based cognitive behavioral therapy [NCT00889005]. ClinicalTrials.gov.

Smith, T. (2009). Randomized controlled equivalence trial comparing videoconference and face-to-face delivery of cognitive processing therapy for PTSD [NCT00941629]. ClinicalTrials.gov.

Strachan, M., Gros, D. F., Yuen, E., Ruggiero, K. J., Foa, E. B., & Acierno, R. (2012). Home-based telehealth to deliver evidence-based psychotherapy in veterans with PTSD [NCT01102764]. *Contemporary Clinical Trials, 33,* 402-409. doi: 10.1016/j.cct.2011.11.007

Thorp, S. R. (2009, February). Telemedicine for improved delivery of psychosocial treatments for post traumatic stress disorder. ClinicalTrials.gov.

Tudor, T. B. (2012, March). Internet treatment for social phobia (iSOFIE-Ro) [NCT01557894]. ClinicalTrials.gov.

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APPENDIX B

Treatment Protocol

<u>Cognitive Behavioural Therapy for High Anxiety Sensitivity</u>

To be used in association with:
Overcoming the Fear of Fear: How to Reduce Anxiety Sensitivity
(Watt & Stewart, 2008)

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Treatment Manual Contents

CHAPTER 1
Introductory Information for Therapists

Anxiety sensitivity, or AS, is an enduring fear of anxiety-related physiological sensations (e.g., increased heart rate) that arises from the belief that they will have serious physical, psychological, and/or social consequences (Reiss, 1991; Reiss & McNally, 1985). For example, a person with high AS who experiences an increased heart rate would be likely to fear this physical sensation out of the belief that it is a sign of an impending heart attack. A long line of research (e.g., Schmidt, Zvolensky, & Maner, 2006) suggests that AS may be a risk factor for anxiety disorders. In particular, past research has implicated AS in the development and maintenance of panic attacks and panic disorder (e.g., Calkins et al., 2009; Hayward, Killen, Kraemer, & Taylor, 2000; Schmidt, Lerew, & Jackson, 1999). Studies have also revealed high levels of AS among those with other anxiety disorders, including generalized anxiety disorder, social phobia, and posttraumatic stress disorder (Schmidt et al., 2006; Taylor, Koch, & McNally, 1992; Zinbarg, Barlow, & Brown, 1997; for review see Cox, Borger, & Enns, 1999).

In addition, research is increasingly examining the role of AS in substance use problems (e.g., Stewart & Kushner, 2001). For instance, individuals high in AS report consuming more alcoholic drinks per week, report drinking to excess more frequently (Stewart, Peterson, & Pihl, 1995), and are disproportionately represented amongst "high consequence" drinkers (i.e., individuals reporting frequent alcohol problems) as compared to those low in AS (Watt, Stewart, Birch, & Bernier, 2006). Longitudinal research has even shown AS levels to predict the development of alcohol use disorders two years later (Schmidt, Buckner, & Keough, 2007). Other research has shown that individuals high in AS also tend to use anxiety-reducing medications more than those low in AS (Telch, Lucas, & Nelson, 1989).

Moreover, anxiety disorders and substance use disorders often co-occur, with some evidence to suggest that high AS might contribute to their comorbidity (Stewart, Samoluk, & MacDonald, 1999). In line with motivational theories of substance abuse, which propose specific personality characteristics are associated with differential activation of brain motivation systems and differential susceptibility to certain drug properties, it may be that individuals high in AS are particularly motivated to use substances to reduce or control their fear of arousal sensations (Stewart et al., 1999). In support, research has shown that: individuals high in AS endorse stronger expectations of the tension-reducing effects of alcohol (Karp, 1993), are more sensitive to the anxiety-reducing effects of alcohol (MacDonald, Baker, Stewart, & Skinner, 2000), and report more negative reinforcement motives for drinking, including drinking to cope with negative emotions and to fit in with others (Stewart, Zvolensky, & Eifert, 2001).

High AS has also been implicated in several other mental health problems. In addition to anxiety and substance use disorders, high AS has been associated with depression (Cox, Enns, Freeman, & Walker, 2001), with several studies finding higher AS levels among depressed individuals than among non-depressed controls (e.g., Otto, Pollack, Fava, Uccello, & Rosenbaum, 1995). High levels of AS (relative to healthy controls) have also been found in individuals with hypochondriacal concerns (e.g., Bravo & Silverman, 2001) as well as those with chronic pain and pain-related anxiety (e.g., Norton & Asmundson, 2004).

In light of the association between AS and mental health problems, the high prevalence of these mental health problems (Statistics Canada, 2004), and their multifaceted psychological, physiological, interpersonal, and economic implications (e.g., Health Canada,

2002), it is necessary to explore interventions that target AS. Moreover, research linking AS to several mental health disorders suggests that interventions targeting AS might have trans-diagnostic implications (Barlow, Allen, & Choate, 2004). In other words, reducing AS might have implications for symptoms of anxiety, substance abuse, depression, chronic pain, and other mental health problems.

Accumulating research supports the efficacy of cognitive behavioural therapy (CBT) in the treatment of anxiety disorders (Norton & Price, 2007; Stewart & Chambless, 2009) and in the reduction of anxiety symptoms (Deacon & Abramowitz, 2004), as well as in the treatment of substance abuse (for review, see O'Connor & Stewart, 2010). A recent meta-analysis found CBT to be efficacious in reducing high AS (Smits, Berry, Tart, & Powers, 2008). Recently, at Dalhousie and Saint Francis Xavier Universities, Dr. Stewart and Dr. Watt (2006a,b) have shown the efficacy of a brief group CBT intervention in decreasing high AS. The intervention included psychoeducation, cognitive restructuring, and interoceptive exposure in the form of physical exercise delivered during three 50-minute group sessions on three consecutive days. Interoceptive exposure activities, such as running, repeatedly expose individuals to feared arousal sensations, reducing fear of these sensations and the tendency to catastrophize about their consequences (Antony, Ledley, Liss, & Swinson, 2006; Stewart & Watt, 2008). Drs. Watt and Stewart (2006a,b) found that levels of AS among women with high AS were significantly reduced following their participation in this brief CBT intervention. In addition, the intervention significantly reduced pain-related anxiety and problematic drinking among those with high AS.

Despite the existence of empirically validated treatments for AS, certain barriers to treatment, including distance from services, the need to fulfill other responsibilities, or lack of sufficient qualified clinicians, continue to limit access to effective psychological treatments. For some individuals, the nature of their disorder limits travel outside the home (e.g., agoraphobia) or increases their fear or embarrassment associated with seeking help (e.g., generalized social phobia) leading them to avoid or delay seeking treatment. In addition, many people (i.e., young people, ethnic minorities, military personnel, etc.) continue to avoid or delay treatment due to the stigma associated with seeking mental health services (e.g., Corrigan, 2004). Many of these barriers are particularly relevant for those who are living in rural communities (Hauenstein et al., 2006). For these populations, treatment options are often limited by a lack of treatment availability and a deficiency of qualified clinicians in their regions. According to the Canadian Standing Senate Committee on Social Affairs, Science and Technology (2006), most mental health services are based in urban centres. For many, finding transportation into the city can be challenging and can discourage them from seeking treatment despite their need. In other cases, the limited number of clinicians means that the waitlists for services are extremely long, with implications for the severity of mental health problems, a person's readiness to change, and the relationship between those seeking care and service organizations designed to help them (McGrath & Cunningham, 2005).

Additional efforts are needed to further reduce barriers to effective treatment. A distance delivery approach to mental health treatment in which treatment is delivered via telephone, mail, internet, etc., is one way to minimize treatment barriers and increase access to care while still delivering standardized, empirically supported treatment. Distance delivery would increase rural communities' access to mental health professionals and reduce the need to travel to urban centres to receive care. The nature of distance delivery also increases client confidentiality (treatment can be done from home) which might help address individuals' fear about the stigma associated with seeking mental health care.

Distance service delivery is a relatively new field; however, research into its efficacy is increasing. For instance, Carlbring and colleagues (2007) tested the efficacy of a 9-week Internet-based CBT with weekly telephone support for individuals with social phobia. Their results revealed that the treatment, but not control, group showed significant reductions in general and social anxiety measures from pre- to post-treatment. In a similar study with individuals with panic disorder, Carlbring et al. (2006) found that of those who completed a 10-week Internet-based CBT with weekly telephone support, 77% no longer qualified for a diagnosis of panic disorder, while all those in the wait-list control group still met diagnostic criteria. In another study, Lovell et al. (2006) compared the efficacy of 10-weeks of CBT for individuals with obsessive-compulsive disorder delivered face-to-face vs. the same program delivered by telephone. Findings showed equivalent treatment outcomes across the two modes of treatment delivery. Recent meta-analyses of telephone and Internet-based treatment programs for mental health problems have suggested that this technique of service delivery is promising (Bee et al., 2008; Reger & Gahm, 2009).

<u>The Present Treatment</u>

In light of the concerns about treatment accessibility raised above, in combination with the promise of distance-delivery, the treatment outlined in this treatment manual is intended to be a distance-delivered CBT treatment to reduce AS in individuals with high AS. This treatment was formulated to (a) address existing treatment barriers, and (b) explore the possible transdiagnostic implications of reducing high AS. The treatment program is based on a self-help book by Dr. Watt and Dr. Stewart based on their research findings on the efficacy of a brief CBT treatment in reducing AS. The book, *Overcoming the Fear of Fear: How to Reduce Anxiety Sensitivity* (2008), describes each of the treatment components in detail; the present document is designed to be used in tandem with this book. The book provides both psychoeducation for clients as well as a number of activities to be used in treatment. Clients will be sent Drs. Watt and Stewart's book in the mail. They will then engage in weekly telephone therapy sessions with a study therapist who will provide them with individualized support and feedback in pursuing the treatment.

This treatment manual provides therapists with instructions on the content of each of the eight weekly sessions they will engage in with their clients. It indicates which topics are to be covered in which session, allocates a recommended amount of time to each topic, and provides suggestions on how the therapist should describe concepts to and engage in activities with their clients. In many places, this treatment manual refers to pages in Dr. Watt and Stewart's book where therapists should look for more information. Because AS is associated with such a range of mental health problems, it is anticipated that clients engaging in this treatment program may have unique patterns of mental health symptoms. With this in mind, it will be important for therapists to tailor the treatment to individuals' unique concerns. Making the treatment relevant to the clients' concerns will increase their engagement in the treatment. Guidelines for tailoring treatment to the clients' needs are offered within this treatment manual; it is important that therapists follow these guidelines rather than deviating from the treatment program.

Each week, the therapist will assign the client a chapter or two to read from *Overcoming the Fear of Fear*. The therapist will then contact the client at their scheduled weekly therapy session time and follow the appropriate session outline detailed in this manual. Each session should be as interactive as possible. Therapists are encouraged to engage their clients as much as possible in each of the activities. This should be done in exactly the same way it would be carried out in a traditional, face-to-face therapy session.

Each session should then conclude with the chance for clients to ask any questions that weren't already answered during the session and a review of the homework the client has been assigned for the following week. Throughout the treatment, the therapist should engage in the same typical CBT therapeutic techniques they would during traditional, face-to-face CBT. For instance, it is important to foster a therapeutic alliance, emphasize the importance of homework, offer the client praise for their accomplishments throughout therapy, use reflective listening, etc. Therapists will be asked to write session notes for each weekly therapy session with the client to keep on record in the client's folder. These notes should detail the content covered during the session, the client's engagement in the session, and any unexpected events that may have arisen or deviations from the treatment protocol.

Like other CBT treatments, the present treatment draws on the principles of psychoeducation, cognitive restructuring, exposure-based activities, and relapse prevention. The goal of treatment is to reduce the client's anxiety sensitivity. It is important for therapists to keep this goal in mind throughout treatment and not be side-tracked by other mental health symptoms the client is presenting with. These symptoms should be addressed within the confines of the treatment protocol. Deviating from the protocol may have implications for treatment efficacy. What follows below is a brief outline of the topics to be covered in each of the eight telephone therapy sessions.

Session I orients clients to the structure of the telephone therapy sessions and forms the foundation of the therapeutic alliance. Clients are introduced to the concept of anxiety sensitivity and provided with psychoeducation around anxiety and anxiety sensitivity (e.g., how it might develop, how high anxiety sensitivity may manifest). During this session the therapist will provide feedback to the client on their level of anxiety sensitivity. The clients are also given an opportunity to share their experiences with high anxiety sensitivity and other related mental health problems. This initial session serves as clients' introduction to cognitive behavioural therapy and provides them with an overview of how treatment will progress. The importance of homework and session attendance will be emphasized.

Session II again focuses largely on psychoeducation. Clients are provided with information on how anxiety sensitivity is linked to anxiety disorders and other mental health disorders including depression, substance us problems, and chronic pain. The idea of anxiety sensitivity as a "risk factor" will be explained. During this session clients will be given an opportunity to explore how their high anxiety sensitivity might be connected to some mental health problems they are experiencing. The idea that clients may be able to see improvement in their mental health by focusing on their anxiety sensitivity will be conveyed. Finally, the cognitive component of treatment will be introduced as clients will be taught the connections among thoughts, feelings, physical sensations, and behaviour.

Session III introduces the concept of cognitive restructuring, which will be carried over to the next session. In this session, the connections among physical sensations, thoughts, feelings, and behaviour will be further explained and explored with clients. Clients will then be taught to identify and recognize their own thoughts and consider how some of their thoughts may be thinking errors. Therapists will teach clients to identify dysfunctional automatic thoughts using a procedure clients will practice using over the following week.

Session IV continues with the theme of cognitive restructuring. Clients will revisit the idea of negative automatic thoughts and discuss their success in identifying their own negative automatic thoughts over the past week. During the session, therapists will help clients learn to

challenge their dysfunctional automatic thoughts by examining the evidence (e.g., "What are the chances?", "So what?") and replace them with reasonable thoughts.

Session V introduces the next step in targeting high anxiety sensitivity, which is changing behaviour. The benefits of changing behaviour for physical sensations, mood, and thoughts will be discussed in session. Also during session, clients will be given the opportunity to discuss their current (positive or negative) mechanisms for coping with anxiety and explore the short- and long-term implications of each. Finally, therapists will introduce clients to the idea of using interoceptive exposure to modify behavioural responses to anxiety by facilitating habituation of the feared sensations. Clients will be given a physical exercise program to follow over the next seven weeks.

Session VI also focuses on interoceptive exposure. The client's experience with the interoceptive exposure exercises will be discussed and therapists will help the client with any troubleshooting around homework compliance. The therapist will work to individualize the interoceptive exposure to target the client's specific fears with respect to arousal-related sensations. During session they will discuss how the physical sensations experienced during exercise are similar to and different from those experienced when anxious and what the implications of these relationships are.

Session VII introduces clients to the idea of not only changing their behaviour but also extending things learned in treatment into their lifestyle. During this session, therapists will teach clients about the General Adaptation Syndrome and explain how stress and anxiety sensitivity might interact. Therapists will help clients recognize ways they can establish healthy-lifestyle habits (nutrition, sleep, breathing, physical exercise, humour) to manage their stress.

Session VIII is a wrap-up session. Therapists will help clients develop ways (e.g., decisional balance scale) to help them recognize the benefits of change. During the sessions, clients will also develop a plan to help prepare them for setbacks in the coming weeks so they can prevent relapse, with a particular focus on their specific mental health concerns. In addition, clients will be instructed to continue with their exercise program over the next four weeks. Therapists will address any of the clients' concerns about the treatment as a whole and how to continue to implement and extend their treatment gains. Finally, therapists and clients will discuss any gains the client has made during treatment.

Following Session VIII, research assistants will contact clients two weeks and four weeks later. These phone calls are intended as check-ins around the physical activity component of treatment. They are not intended to be additional therapy sessions to help with other areas of treatment. Therapy will be terminated during the last telephone session.

CHAPTER 2
Pre-Treatment Assessment & Information

Following recruitment and screening, participants will complete a pre-treatment questionnaire delivered in the mail and a telephone-administered Structured Clinical Interview for DSM-IV (SCID). Clients will be told some of the information listed below during the informed consent and pre-treatment assessment phases, but the information should also be emphasized during their first telephone therapy appointment.

1. The research treatment process is eight sessions over eight weeks. This will be followed by a month in which the client is expected to continue with the exercise program independently. They will be contacted at 10 weeks and 12 weeks by a research assistant to check-in and troubleshoot around the exercise component of treatment. The first therapy appointment will be set up by the research staff. Therapists will be responsible for booking the remaining seven sessions. The two follow-up phone calls will be booked after the eighth therapy session by research staff.

2. Compensation for clients will take place after each assessment period and will consist of $10 for each questionnaire completed (pre-treatment, eight weeks, 12 weeks, and follow-up) as well as $10 for completing treatment. Compensation will be awarded in the form of gift cards to Atlantic Superstore or Chapters at the participant's choice.

3. Time in sessions is very limited, and with a great deal of material to cover homework needs to be done during the time between sessions so as to make the most of the time in sessions. In addition, if there is no response on a client's telephone when the therapist calls for the client's appointment, they should try again 5 minutes and 10 minutes later. If there continues to be no answer, the session will be cancelled, as there will not be time to fit all of the material into the remaining time. In the case of a missed session, please rebook as soon as possible. If a session needs to be cancelled or moved due to an unavoidable time conflict, clients should contact their therapist or research staff as soon as possible.

4. Reminder telephone calls or emails will be made by the research assistant one or two days prior to the appointment (on the previous Friday, in the case of Monday appointments). If a client has any concerns or preferences as to how these reminders are delivered (i.e., whether they can be left on an answering machine or relayed as a message to other individuals who may answer the phone), the time to express these preferences is now, before treatment begins. Email reminders are also a possibility if the client prefers.

5. Between session support can be obtained by calling the Mental Health Mobile Crisis Team at (902) 429-8167. This hotline is not affiliated with this project.

6. Imminent suicidality or other mental health issues of an overwhelming nature, such as a psychotic episode, that would affect the ability of treatment staff to deliver the best possible anxiety sensitivity treatment, will result in removal of clients from the research

project, with a follow-up referral to an appropriate agency. Clients would be welcome to re-join the investigation if their suicidality is no longer imminent risk.

7. Accessing other forms of formal psychological treatment during the study is discouraged. Clients who do so may have to be removed from the study. It is okay for clients to be using a pharmaceutical treatment during the study, however, they must maintain this treatment at a constant dose throughout the course of treatment or they may be removed from the study. Clients are asked to report any changes in pharmaceutical treatment or psychotherapy to their therapist.

8. Clients' names or other identifying information are not included on materials sent to the clients in the mail so as to protect their confidentiality. Questionnaires will simply be labelled with a subject number; files matching subject numbers with participant names will be kept in a locked filing cabinet and password protected documents in the research lab.

<u>Chapter 3</u>
SESSION 1: **Psychoeducation**

Objectives:

1. Develop the therapeutic alliance.
2. The therapist should normalize the client's experience of anxiety sensitivity as well as their experience of the body's normal response to stress. The client should have generated some ideas about how they might have developed high anxiety sensitivity.
3. The client should understand what anxiety sensitivity is, how it exacerbates the Anxiety Cycle, and how it is related to fear, anxiety, panic, and stress.
4. The client should leave the session with the ability to recognize signs of their own high anxiety sensitivity and understand how they were identified as having high anxiety sensitivity.
5. The client should feel that they have left the first session with an idea of how treatment will progress and how it will help them to meet their goal of reducing anxiety sensitivity.
6. The client should leave the session with the understanding that behavioural change is a process and it is something that they are responsible for. Homework is emphasized as an important part of what will determine their success with this treatment.

Timeline for Session 1:

10 min	Introduction/Agenda
10 min	Anxiety Profile
10 min	Introduce Anxiety Cycle & Anxiety Sensitivity
5-10 min	Investigate Development of Anxiety Sensitivity
5 min	Personalized Feedback on Client's Anxiety Sensitivity assessed Pre-treatment
5 min	Introduce Cognitive Behavioural Model of Anxiety Sensitivity Treatment
5 min	Questions from Client re: Treatment Material for Week & Homework Assignment

Overview:

The first step, beginning during the initial assessment contact, is to establish rapport and encourage hope. Individuals with high anxiety sensitivity may be having a range of associated mental health conditions. They may endorse severe anxiety symptoms or they may be plagued by chronic pain. Some of the symptoms will require you to dig more into their daily behaviour; clients won't always realize that their excessive alcohol use, for instance, may be associated with their high level of anxiety sensitivity. Because anxiety sensitivity can have such broad implications, it is important for the therapist to help the client see how this particular treatment program can be relevant for their specific concerns. During the psychoeducation phase it is important for the therapist to give the client the opportunity to discuss how each of the ideas might relate to their particular situation so they can leave the first session feeling that they have been heard and understood and that their clinician cares and can help them.

Therapy may be a new experience for the client, and even more relevant, doing therapy over the telephone will most certainly be something they have not done before. With this in mind, the therapist will have to clearly explain all the ins and outs of the distance-based therapeutic relationship and how the treatment process will work. Many clients may be wary about treatment and it is important they are given the opportunity to ask questions and develop a comprehensive understanding of what lies ahead in the treatment process.

The first session focuses largely on psychoeducation around anxiety sensitivity. The therapist should make sure the client understands some basic concepts about fear, anxiety, and panic before moving on to introduce and discuss anxiety sensitivity. Most likely the client's main concern will not be high anxiety sensitivity, but rather how it is affecting their life. It is important for therapists to normalize this experience for clients. In this way, psychoeducation around the development of anxiety sensitivity is important to help clients understand why they might have developed some of the problems they are having. Because anxiety sensitivity may not be an obvious concern to the client, it is important for the therapist to help the client to recognize high anxiety sensitivity in him or herself and to understand how they were identified as having high anxiety sensitivity. The goal in the first session is to use psychoeducation to plant some seeds for the client so they can see the potential for a path to improvement by pursuing this treatment program.

Session Tasks:

1) Introduction

- Therapist introduction
- Review administrative procedures
    - rescheduling appointments
    - missed appointments
    - reminder calls
    - schedule of appointments
- Outline structure of treatment/sessions
    - review limits of confidentiality
    - expectations about homework, reading treatment manual

2) Collecting the Client's Anxiety Profile

The task for the therapist is to develop a relationship with the client, encouraging them to talk about what has brought them to therapy, and what they expect to get out of the therapy experience. Then, through probing and selective attention to details, the therapist should broaden their understanding of the client by looking at the larger picture of what factors have led to the current problems/goals and how their particular client experiences anxiety.

Questions to consider:
- What brought you to pursue treatment?
- How would you know this is a problem for you? How does this impact your life? How have your difficulties affected you/your family/your work)?
- What do you hope to accomplish or gain through the treatment program? What do you see being different when you are finished?

Each client in this study will have high anxiety sensitivity; however, finding out in what areas of life the client is having difficulty will shed light on how high anxiety sensitivity is affecting their functioning. This can be called the client's 'anxiety profile'. It is important to get details of how the client experiences anxiety, when they experience anxiety, and what part of the anxiety experience is most distressing for them (e.g., health consequences of physical sensations, embarrassment).

Questions to consider:
- Different people show anxiety in different ways. How do you know you're anxious? What does it feel like when you're anxious? Where do you feel the anxiety?
- Different people experience anxiety in different situations, when do you notice anxiety?
- Are you distressed by the body sensations you experience when you're anxious?
- Do you worry about other people noticing that you are anxious?
- When you experience anxiety do you worry about losing control?

As the client and therapist elucidate the client's most pressing concerns, the therapist must summarize and draw some rudimentary connections to high anxiety sensitivity and the treatment under investigation so the client can understand how their problems can be addressed by the present treatment.

It is important for the therapist to continue to incorporate the client's unique anxiety profile into the subsequent psychoeducation in this session. Make sure the concepts that are introduced can be related back to the client's experience or else introduced as possibilities that other people might experience. **In fact, it may be easiest to combine parts 2 and 3 during this session.**

3) Introduction to Anxiety Cycle & Anxiety Sensitivity

The focus in this section is for the therapist to provide psychoeducation to the client on anxiety and anxiety sensitivity, while linking things back to the client's experience. First, the therapist should discuss the basic ideas of fear and anxiety with the client and introduce them to the anxiety cycle.

The therapist can refer to p. 9-17 for the important points to cover, including:
- anxiety and the autonomic nervous system (fight or flight)
- physical sensations experienced
- anxiety as a natural and important emotion
- anxiety sensitivity
- the anxiety cycle and panic
- three areas of anxiety sensitivity – physical, social, psychological

What follows is an example of how this interaction might go between a therapist and client. It will have to be changed in accordance with the clients' specific complaints.

Therapist: It sounds like you are experiencing anxiety in your life right now. [*The client will likely have mentioned situations that make them anxious that the therapist can mention here; if not, the therapist can discuss that now.*] It is important to know that everyone experiences anxiety and it is good to experience anxiety. Can you think why that might be?

Client: Well I guess if I wasn't ever anxious I wouldn't prepare for presentations at work. Or I might not avoid something dangerous.

Therapist: Exactly. Anxiety is our body's way of telling us to prepare for fight or flight, a response to threat that is controlled by our autonomic nervous system (ANS) in our body. The ANS controls many of our muscles and organs in our body and operates involuntarily; in other words it kicks into action by itself, without us thinking about it. When the ANS starts up you'll notice changes in your body. So, for example, if someone is faced with an anxiety-provoking situation they might feel their heart rate speed up, they might notice an increase in sweating, or they might feel dizzy. Do you notice what happens to your body when you're anxious? What sorts of sensations do you experience?

Client: When I'm anxious I usually get a lot of chest pains; it feels like there is this big weight on my chest making it hard to breathe. My heart rate increases and my hands shake.

Therapist: That sounds like some very common sensations that people experience when they are anxious. The reason our body does those things is to prepare us to react to the possible threat or danger. Anxiety is important, it is when it gets to be too much that it can be a problem. [*Refer to Yerkes-Dodson law, p.11.*] Is that clear to you?

Client: Yes, I can see why my body does those things and why it would be important. But I worry that those things I experience, like my heart beating really fast, is going to cause me to get sick, like maybe I will have a heart attack.

Therapist: I can see how if you thought you were going to have a heart attack that would be very worrying. That is where anxiety sensitivity comes in. Anxiety sensitivity is a way of thinking that involves an extreme fear of anxiety sensations. People who are highly sensitive to anxiety sensations tend to believe that those sensations are harmful or are going to have catastrophic consequences, like physical or mental illness, loss of control, or social embarrassment. Do you know what I mean by catastrophic consequences?

Client: Not exactly.

Therapist: It's kind of like the instant you reach into your pocket and realize that your credit card is not there where you expected it to be, for example. You experience a rush of worry and think that it is probably lost for good or someone stole it. We instantly think the worst thing happened before we think through the situation and realize that maybe it is in our wallet in the car, or remember that we left it by the computer when we ordered something online last night. Does that sound like something you experience when you notice your anxiety sensations?

Client: Well yes. Every time I am anxious I worry I am going to have a heart attack. Or sometimes I worry that my friends are going to see me shaking and make fun of me for it. [*This might also provide an opportunity for the therapist to discuss the different concerns (physical, social, psychological) that individuals with high anxiety sensitivity might experience.*]

Therapist: It sounds like when you experience those physical sensations you get even more worried about them. That is something that is common for people with high anxiety sensitivity. When people with high anxiety sensitivity experience unexpected body sensations related to anxiety they tend to "turn up the volume" on those sensations, just like a radio dial. They feel frightened and pay a lot of attention to the sensations, think a lot about what they mean and what the consequences might be. And these thoughts lead them to develop additional anxiety which just causes the anxiety sensations to become more and more intense. We call this the anxiety cycle. Sometimes people who experience this end up having panic attacks. Has this ever happened to you?

Client: I think so. Sometimes I just freak out and get so scared and my heart beats like crazy and I hyperventilate.

Therapist: Yes, that sounds like a panic attack. Panic attacks aren't actually harmful, they can't hurt you. But they definitely are unpleasant to experience. What we want to work on during this treatment is to help you recognize when you are experiencing anxiety sensations and then think about those body sensations realistically rather than catastrophically. The goal is to get to the point where you still notice the sensations, but recognize them as normal responses to anxiety and remember that they will go away after some time.

And we'll help you recognize that these body sensations that we experience when we're anxious can also happen for a variety of other reasons. So for example, you might experience those sensations when you were about to give a talk and were nervous. But there are some other times when you might experience those same sensations when they aren't related to anxiety. For example, when you exercise you might notice that your heart rate increases, it's hard to breathe, and you sweat a lot. This might also happen when you get angry or upset or really excited. By realizing what our body is responding to, it can make the actual body sensations we're experiencing less scary.

4) Investigate Development of Anxiety Sensitivity

Often clients want to know how they came to have this problem. They may ask questions about what they did wrong or alternatively may be keen to place responsibility for their problems on their parents or other people close to them. In order to give the client a full understanding of how high anxiety sensitivity might develop, providing some brief psychoeducation will be helpful.

Provide the client with a very quick overview of each of the possible origins of anxiety sensitivity. You can discuss with the client which they might see as most relevant in their life.

- Genetics – "Research has found that genetics play a role in the transmission of high anxiety sensitivity and can explain about 50% of individual differences in anxiety sensitivity. So if you have a parent with high anxiety sensitivity you are more likely to have high anxiety sensitivity yourself."

- Learning – "Because genetics only explains about half of the variation in anxiety sensitivity levels, learning experiences help explain some additional variation. For instance…"

    o Classical conditioning – learning that there is an association between two events; in other words, if someone experiences anxiety symptoms paired with a frightening event they might learn to fear the anxiety symptoms

- Instrumental learning – learning an association between a behavior and a consequence; in other words getting positive reinforcement for something increases the likelihood that you will do it, such as getting rewarded through special attention for your anxiety symptoms or your sick behaviour in childhood

- Vicarious learning – a type of learning involving watching others' behaviour and learning from their experiences; in other words, another person's behaviour might tell or show you that anxiety symptoms are scary or are cause for concern

The therapist should try to provide concrete examples of each of these types of learning experiences (see pages 21-25).

- Attachment – insecure attachment could predispose people to develop high anxiety sensitivity

The therapist should also mention the sex differences in terms of both environmental (socially prescribed gender roles) and genetic (more heritable for women) factors.

The therapist can explore whether each of the above possibilities are relevant to the client's life by using the questions on pages 22-24.

5) Personalized Feedback on Client's Anxiety Sensitivity assessed Pre-Treatment

In this section, the therapist will explain to the client how they were identified as having high anxiety sensitivity. This should be done by asking the client if they recognize the Anxiety Sensitivity Index questions listed in the text. For instance,

> "*When you were reading the chapters for this week you may have noticed a questionnaire on p. 33 called the Anxiety Sensitivity Index. By having someone answer these questions we can find out if they have high anxiety sensitivity. Do you recognize these questions from the questionnaire you filled out before starting treatment or from the questions that were asked to you over the phone as part of the screening process for this study? Your answers to these questions told us that you have high anxiety sensitivity. You can use this questionnaire again during treatment to see if your level of anxiety sensitivity is decreasing.*"

6) Introduce Cognitive Behavioural Model of Anxiety Sensitivity Treatment

As a wrap-up to this first session, the therapist should give the client an understanding of what they can expect in the treatment to come. The therapist can briefly explain that the organization of this treatment program follows a type of treatment called cognitive behavioural therapy. Here are some key points about CBT (more information can be found in the treatment manual if needed):

- CBT is based on the principle that the ways we think, we feel, and we act are all connected.
- In accordance, CBT is a treatment designed to change faulty ways of thinking and acting.
- The therapist can cite, as an example, the earlier discussion on anxiety sensitivity, and how the way they thought about their anxiety sensations (i.e., as things that would lead to catastrophic consequences) influenced how they felt (i.e., terrified) and what they did.
- This is only meant to be a brief introduction to CBT, and can be led by the clients' questions.
- The therapist might also use the "old house" analogy (on p. 78 of the treatment manual) to help explain the relation between thoughts, feelings, and actions to the client.

7) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

8) Homework

The client's homework for the coming week is to read Chapters 4 and 5 of the treatment manual. They should record any questions that come up during their reading so they will remember them during the therapy session.

The therapist should tell the client briefly what the content of next week's reading and session will be and ask them to consider which parts of the reading are the most relevant to their situation. For instance:

"Alright, well it looks like we have finished up for today. Like we talked about at the beginning of the session, every week I am going to give you some homework that I'll ask you to do for our next session. Homework is very important, because otherwise we really only spend one hour a week during the session working on the difficulties you are having, and it's really not enough time, so you'll have to work hard during the rest of the week too! This week, I'll ask you to read Chapters 4 and 5 from the treatment manual. They talk about how having high anxiety sensitivity can be linked with having mental health problems. So for example, someone with high anxiety sensitivity is at greater risk for having an anxiety disorder, like panic disorder. When you are reading through the chapters I want you to think about which parts might be most relevant to you – tell me next week which ones you related the most to and which ones didn't sound like you at all, okay? Any questions?"

Chapter 4
SESSION 2: **Psychoeducation**

Objectives:

1. Continue to develop the therapeutic alliance.
2. The client should understand the importance of completing homework for the success of their treatment.
3. The client should understand what a 'risk factor' is and how anxiety sensitivity acts as one in relation to the development of mental health disorders.
4. The client should leave the session with the ability to recognize the link between their high anxiety sensitivity and other mental health problems they are experiencing. The experience of mental health problems should be normalized.
5. The client should feel that they have left the second session with an idea of how treatment will help them to meet their goal of reducing anxiety sensitivity as well as their related mental health problems.
6. The therapist should leave the session with a more clear understanding of how anxiety sensitivity manifests in the client's life and how treatment content will be tailored to the client's specific concerns.

Timeline for Session 2:

10 min	Introduction: Agenda & Review of Last Session
10 min	Anxiety Sensitivity and Anxiety Disorders
10 min	Anxiety Sensitivity and Other Mental Health Problems
10 min	Identifying and Recognizing Connections among Anxiety Components
5 min	Questions from Client re: Treatment Material for Week & Homework Assignment

Overview:

During this session the therapist should continue to work to develop rapport with the client. Given the media through which therapist-client contact is taking place, it will be important for therapists to establish rapport through use of verbal language, as the assistance of traditional non-verbal cues will not be available.

The primary purpose of the second session is two-fold. First, the intention is to provide clients with psychoeducation on the association between anxiety sensitivity and the development of anxiety and other mental health disorders. Discussion on this subject will already have started in the previous session, however, at the time of the second session clients will have read more detailed, relevant information in the treatment manual. Each client will have their own specific concerns with respect to anxiety sensitivity's mental health implications in their life. For instance, some clients will strongly relate to the substance use-related manifestation of anxiety sensitivity, while others will find the case vignettes of panic disorder are most salient for them. The therapist is responsible for identifying the client's unique concerns and particular situation and focusing the session appropriately.

The second aspect of this session's purpose is to then use the psychoeducation provided to the client to help them understand why they may be experiencing their unique pattern of mental health symptoms. The point is to elucidate for clients how anxiety sensitivity might be behind some of their mental health symptoms. This will help clients understand why they are feeling they way they are, with the intention of decreasing confusion, frustration, fear, etc. with respect to their emotional and behavioural experiences. It will also be important for the therapist to normalize the experience of these mental health symptoms for most clients. Finally, it will be essential for therapists to outline for clients how therapy related to decreasing anxiety sensitivity will have broader implications for their mental health. This may involve, for instance, describing for a client how their panic disorder symptoms might lessen if they have treated their anxiety sensitivity.

At the end of this session, the therapist will begin to introduce the client to the cognitive behavioural therapy model and introduce the relevance of thinking patterns for anxiety sensitivity.

This session will also serve as a test of the client's adherence to the homework component of treatment. Therapists may need to spend some time re-emphasizing the importance of homework for treatment success to their clients and encouraging clients' compliance.

Session Tasks

1) Introduction

- Check in on client completion of homework
    - If client has not completed homework adequately, the therapist should reiterate its importance.

- Outline session agenda
    - Therapists should explain to clients that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
    - Highlight theme of session.

- Before getting started, the therapist should check the client's comfort level with this form of treatment-delivery; clients could be asked if they have any questions related to the logistics of the treatment.

2) Psychoeducation: Anxiety Sensitivity Related to Anxiety Disorders

To begin the second session, therapists should review briefly the content of the previous session and remind clients of the theme of this session. For instance:

"Last week we talked a lot about anxiety sensitivity. I gave you a lot of information, that might have been a bit much to take in. We talked about anxiety, how it can be good and bad, and we talked a lot about anxiety sensitivity and what having high anxiety sensitivity means. And we also talked about different reasons that someone might have high anxiety sensitivity. Do you have any questions about the things that we discussed last week? […]

This week we are going to continue our discussion of anxiety sensitivity and why it is important. As you've probably seen from the reading in the treatment manual, this week I'd like to talk about how anxiety sensitivity might be related to some of the problems that you are having in your life. We're going to talk about how having high anxiety sensitivity might be related to having an anxiety disorder, chronic pain, depression, or substance use problems. Then we'll talk about how working on decreasing your anxiety sensitivity might also help reduce the other problems you are experiencing."

The therapist will then introduce, individually, anxiety sensitivity's association with panic disorder, social phobia, and post-traumatic stress disorder. For each of these disorders, the therapist will emphasize:

1) Psychoeducation on the disorder, including what it is and how its symptoms might appear in one's life

2) Psychoeducation on how the disorder is linked with anxiety sensitivity, including describing the nature of the relationship (e.g., is anxiety sensitivity a risk factor for a certain disorder? If so, the therapist must ensure the client has a good idea of what a 'risk factor' is)

3) Discussion of whether the client might be experiencing symptoms of a particular disorder, including what symptoms the client does and does not identify with

4) Drawing connections between treating high anxiety sensitivity and reducing particular mental health symptoms

The therapist should try to make these sessions as interactive as possible by relating the psychoeducation material back to the client's personal experience, asking the client questions about their experiences, and encouraging the client to ask questions and express opinions. The use of concrete examples, anecdotes, analogies, and other things that clients might be able to understand and latch onto will be very helpful.

The amount of discussion on each particular disorder will depend on its relevance to the client! The therapist should focus on discussing the anxiety disorders that are related to the client's current mental health difficulties. For instance, if the client is experiencing panic attacks, this would be a key topic of focus and the therapist might not discuss posttraumatic stress disorder more than briefly. Alternatively, if the client is not experiencing any anxiety disorders, the therapist should provide a very brief overview of ways the participant can be wary of anxiety symptoms that might arise for these disorders.

Some key points for each of the three anxiety disorders that could be discussed are listed below:

Panic Disorder (p. 39-43):
- There should have been some discussion of panic attacks in the previous session; the therapist should review the descriptive DSM criteria of a panic attack
- The therapist should normalize the experience of panic for the client, explaining how common panic attacks are, and that having panic attacks does not necessarily mean someone has panic disorder
- An explanation of agoraphobia may be important for many clients experiencing panic attacks
- *The questions on p. 41 of the treatment manual can be used to make the session interactive and to draw connections between theory and the client's experience
- Emphasis should be placed on explaining that anxiety sensitivity is a known risk factor for panic disorder; in other words, having high anxiety sensitivity increases the chances someone will develop panic disorder (research from the treatment manual can be used to provide concrete examples of this finding)

Social Phobia (p. 43-47)
- The therapist will explain what social phobia is, what people with social phobia fear, and how they then behave in situations they fear (p.44).
- The therapist should normalize the experience of fears of public speaking and performance as well as the diagnosis of social phobia for the client.
- *The questions on p. 44 of the treatment manual can be used to make the session interactive and to draw connections between theory and the client's experience, as can the vignette on p. 46-47
- Emphasis should be placed on explaining that high anxiety sensitivity is associated with social phobia. This may be because individuals fear being negatively evaluated when displaying observable anxiety symptoms.

Posttraumatic Stress Disorder (p.47-52)
- The therapist should explain what PTSD involves (experiencing trauma and three categories of subsequent symptoms) and normalize the experience
- After explaining what PTSD involves, if the client has not experienced a traumatic event little time needs to be spent discussing PTSD.
- *Questions on p. 48 can be used to determine if the client has experienced a traumatic event and if they are experiencing symptoms related to this trauma, as can the vignette on p. 51-52
- Emphasis could be placed on explaining how having high anxiety sensitivity might put individuals at risk for experiencing more intense reactions to trauma, might arise from the trauma itself, and/or might amplify PTSD symptoms

3) Psychoeducation on Anxiety Sensitivity and Other Mental Health Disorders

In a similar manner to that outlined in the previous section, the therapist will then introduce anxiety sensitivity's association with other mental health disorders, specifically: depression, health anxiety, chronic pain, substance abuse, and other problems such as menstrual distress (if applicable). As was done above, for each of these disorders, the therapist will emphasize:

1) Psychoeducation on the disorder, including what it is and how its symptoms might appear in one's life

2) Psychoeducation on how the disorder is linked with anxiety sensitivity, including describing the nature of the relationship (e.g., is anxiety sensitivity a risk factor for a certain disorder? If so, the therapist must ensure the client has a good idea of what a 'risk factor' is)

3) Discussion of whether the client might be experiencing symptoms of a particular disorder, including what symptoms the client does and does not identify with

4) Drawing connections between treating high anxiety sensitivity and reducing particular mental health symptoms

The therapist should try to make these sessions as interactive as possible by relating the psychoeducation material back to the client's personal experience, asking the client questions about their experiences, and encouraging the client to ask questions and express opinions. The use of concrete examples, anecdotes, analogies, and other things that clients might be able to understand and latch onto will be very helpful.

Again, the amount of discussion on each particular disorder will depend on its relevance to the client! The therapist should focus on discussing the disorders that are related to the client's current mental health difficulties. For instance, if the client is experiencing substance use problems, this would be a key topic of focus and the therapist might not discuss chronic pain in detail, for instance. Alternatively, if the client is not experiencing any of these mental health problems, the therapist should provide a very brief overview of ways the participant can be wary of symptoms that might arise for these disorders.

Some key points for each of the mental health disorders that could be discussed are listed below:

Depression (p. 53-56)
- The therapist should review the descriptive DSM criteria of depression, including the list of possible symptoms and the required length for each (p. 53-54)
- The therapist should normalize the experience of depression for the client, explaining how common depressive symptoms are and who is at a great risk (women) of experiencing them
- *Questions on p. 54-55 can be used to make the session interactive and to draw connections between theory and the client's experience, as can the vignette on p. 56
- Emphasis should be placed on explaining that high anxiety sensitivity is associated with depression. This relation may be particularly important with respect to the psychological concerns component of AS; in other words, symptoms of depression may be amplified by a fear of losing control. The need to maintain control is a common factor in depression but can be exhausting and sets an impossible standard leading to hopelessness and helplessness.

Health Anxiety, including Hypochondriasis (p. 56-59)
- Because it may be less well known/understood than some of the other mental health disorders, the therapist should review what health anxiety and hypochondriasis are with the client (p. 57) and how a person might meet criteria for these disorders (fears, distress, etc.).
- *Questions on p. 57 can be used to make the session interactive and to draw connections between theory and the client's experience, as can the vignette on p. 58-59
- Emphasis should be placed on explaining the role of high anxiety sensitivity in the development and persistence of hypochondriasis. High levels of anxiety sensitivity have been found in those with hypochondriasis; furthermore, there may be a link

between childhood learning experiences and the acquisition of high anxiety sensitivity and hypochondriacal concerns.

Chronic Pain (p. 59-62)
- Emphasis should be placed on explaining that high anxiety sensitivity is associated with chronic pain and can even distinguish panic patients with and without chronic pain.
- The therapist should help the client understand that high anxiety sensitivity is not necessarily associated with a high severity of pain, but instead is closely linked to increased fear of pain. In other words, anxiety sensitivity affects pain perception.
- The treatment manual cites a number of studies that investigated the relation between pain and anxiety sensitivity; perhaps using one of these studies to explain this relation to clients would be helpful.
- For women, the anxiety sensitivity–chronic pain link might be best explained using the cycle described on p. 61 with respect to labour pain.

Substance Use Disorders (p. 62-68)
- The therapist should explain to clients that having elevated anxiety sensitivity is associated with substance use disorders.
- A brief description of what a substance use disorder is, including the typical symptom pattern (p. 62-63), should be provided to the client. The case study on p.68 can be used to draw connections with the client's experience.
- Depending on the client's experiences with substances, the therapist can draw the link between any of the following substances and anxiety sensitivity:
- *Alcohol*: Emphasis should be placed on the association of high anxiety sensitivity with heavy drinking and alcohol-related problems. Anxiety sensitivity is a risk factor in the development of alcohol use disorders. Also, therapists should explain how anxiety sensitivity is related to people's motives for drinking and is more closely linked to risky drinking motives (e.g., coping and conformity motives).
- *Benzodiazepines*: The therapist should explain what benzodiazepines are and how their use is preferred by those with high (vs. low) anxiety sensitivity. Furthermore, high anxiety sensitivity predicts people's relapse to benzodiazepine use. The case study on p. 64-65 may be used if relevant (i.e., the client identifies difficulties with benzodiazepine use).
- *Nicotine*: High levels of nicotine use are common in people with panic. Emphasis should be placed on how anxiety sensitivity might foster greater anxiety in response to smoking-related cues (e.g., nicotine withdrawal symptoms) thus leading to increased smoking.
- *Marijuana*: The therapist should discuss the relation between high anxiety sensitivity and the severity of marijuana withdrawal symptoms experienced by users as well as with conformity motives for use. Marijuana users with high anxiety sensitivity might fear how withdrawal symptoms will impact their thinking.

Menstrual Distress (p. 68-69)

- For women clients, therapists can describe how anxiety sensitivity might affect the experience of menstrual symptoms; high anxiety sensitivity can result in reporting more severe menstrual symptoms.
- Emphasis should be placed on explaining how high anxiety sensitive women might be more attuned to their bodily symptoms associated with menses and more inclined to fear their consequences, which might in turn exacerbate their symptoms.

4) Psychoeducation: Recognizing Connections among Physical Sensations, Thoughts, Feelings, and Actions

To transition to this activity, the therapist should emphasize that because research shows a link between anxiety sensitivity and a range of mental health problems it may be that by reducing anxiety sensitivity we can help people reduce their anxiety, depression, substance use problems, pain, etc. For this reason, in this treatment we want to work on decreasing the client's anxiety sensitivity level. The therapist should explain that they have already started to work toward that by providing the client with information about anxiety sensitivity, as psychoeducation is the first step in identifying and increasing awareness of anxiety sensitivity in an effort to reduce it.

The therapist should then explain that the next step in learning to manage anxiety sensitivity, and anxiety, is learning to separate anxiety into its component parts – physical sensations, thoughts, feelings, and actions – and to recognize connections among these various parts. Then the therapist and client will be able to aim treatment at these different parts.

First, the therapist should discuss the basic components of anxiety with clients. The therapist can refer to p.74 in the treatment manual for a description of the four major components:
- Physical sensations
- Thoughts
- Feelings
- Actions

A sample situation might be used to illustrate these components more concretely.

Next, the therapist should explain the connections and interrelations among these four components. Particular emphasis should be placed on the anxiety sensitivity experience wherein physical sensations trigger negative thoughts, which bring about increased physical arousal, leading to feelings of apprehension and avoidance behaviour. The figure below is also depicted on p. 75 of the treatment manual and can serve as a resource for therapists.
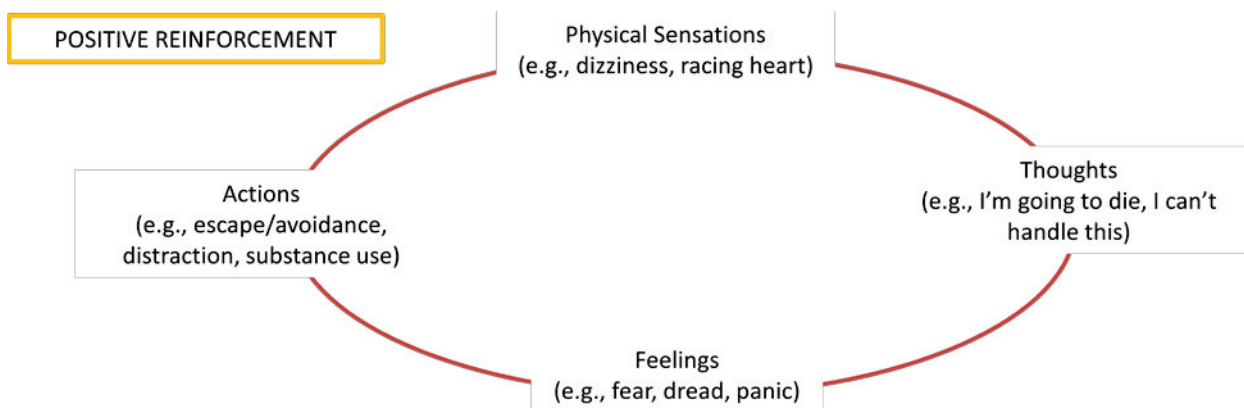
In order to facilitate clients' understanding of the connections among the components of anxiety, the therapist should engage in a discussion with them based on a selection of several of the five questions listed in the treatment manual on pages 76-77. This should be quite interactive, with the therapist eliciting personal answers from the client.

1. What if you walked into a room and everyone stopped talking? What would you think? How would you feel? What would you do? Then, consider another possibility: what if it was your birthday and you suspected that some people in the room were planning to surprise you in some way? How would you feel then?

2. Can you think of examples of when your actions affected your thoughts or feelings?

3. Can you think of examples of when your actions affected your physical sensations?

4. Can you think of examples of when your thoughts affected your physical sensations?

5. Can you think of examples of when your physical sensations affected your actions?

At the end of this activity, the therapist should again emphasize to the client that the reason that they are discussing this is so together they can work on targeting treatment at each of these different components of anxiety sensitivity and anxiety. One of the most powerful parts of this cycle is our thoughts. They are very influential on feelings and actions, as the client and therapist should have recognized sometime during this activity. Therapists should explain to clients that it can be difficult to identify the thoughts that we have (this likely will already have arisen during this activity). However, this is an important skill to have in order to find out how thoughts are affecting feelings and behaviour.

The therapist will assign the client some homework related to thought identification. Over the next week the client should come up with one situation in which they were feeling nervous/anxious, one in which they were feeling happy, and/or one in which they were feeling either sad or angry. Then the client should write down:
a) What the situation was
b) At least one thought they were having during that situation

c) How they were feeling

d) What happened

Next session the client and therapist will engage in a similar activity with a focus on negative cognitions, but for this session, the key is to give clients practice identifying thoughts.

5) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

6) Homework

In addition to the homework assigned in part 4) above (which the therapist should remind the client about at the end of the session), the client's homework for the coming week is to read Chapter 6 of the treatment manual. They should record any questions that come up during their reading so they will remember them during the therapy session.

The therapist should tell the client briefly what the content of next week's reading and session will be and tell them to consider which parts of the reading are the most relevant to their situation. For instance:

"Alright, well it looks like we have finished up for today. Like we talked about last week, every week I am going to give you some homework that I'll ask you to have done for our next session. This week, I'll ask you to read Chapter 6 from the treatment manual. This chapter builds on what we were discussing today and talks about how our thoughts contribute to our anxiety experiences. In particular, it discusses how our thoughts impact how we feel and what we do when we're anxious. The thoughts we think and the kinds of things we say to ourselves can either heighten or lessen our anxiety. When you are reading through the chapters I want you to think about which parts might be most relevant to you – tell me next week which parts you related the most to and which parts didn't sound like you at all, okay? Also, there are a lot of exercises included in this chapter. You may start some of them if you wish, but we will discuss them in detail next week. Any questions?"

Chapter 5
SESSIONS 3 & 4: **Cognitive Restructuring**

Objectives for Sessions 3 & 4:

1. Continue to develop the therapeutic alliance.
2. The client should learn how to separate anxiety into its component parts – physical sensations, thoughts, feelings, and actions.
3. The client should recognize the connections among physical sensations, thoughts, feelings, and actions, and understand how this relation manifests with respect to their own anxiety.
4. The client should learn how to identify their fearful and anxious thoughts including dysfunctional automatic thoughts (e.g., catastrophic thinking and probability overestimation).
5. The client should be taught to challenge their own thinking by way of examining the evidence and de-catastrophizing.
6. At the end of this process, the client should learn how to replace their negative thoughts with reasonable and realistic thoughts.
7. At the end of the session the client should leave with an ability to tackle their anxiety using the following cognitive strategies: identify their negative thoughts, recognize the relation between these thoughts and the other components of anxiety, challenge these thoughts, and replace them with realistic thoughts.

Overview:

The primary purpose of the third and fourth sessions are to examine how our thoughts contribute to anxiety sensitivity and anxiety experiences. The therapist will focus first on educating clients about the different components of anxiety and second on teaching clients to use this knowledge to implement strategies to reduce their anxiety sensitivity. The next several sessions will involve more hands on work for the clients on their own and more interactive work during sessions than was present in the first two psychoeducation sessions. The importance of completing homework must be reinforced to clients. While clients are to read all of Chapter 6 in the treatment manual before this session, session 3 will focus primarily on introducing clients to this material and explaining to them how to complete the activities. Then, the subsequent week and session 4 will be devoted to the client practicing using the techniques they were taught.

As was started in the previous sessions, clients are being taught how to separate anxiety into its component parts – physical sensations, emotions, thoughts, and actions – and to understand the connections between each of these four components. Clients will learn how

the thoughts they have impact how they feel and what they do when they are anxious. The therapist will then teach the client how to identify their own thoughts, particularly their dysfunctional automatic thoughts. This instruction will need to involve some psychoeducation around the most common types of thinking errors: *catastrophic thinking* and *probability overestimation*. This type of teaching is best done through engaging in activities with the client in which the focus is on the client's own experience rather than on abstract concepts.

After clients have learned to identify their thoughts and isolate those that are dysfunctional and automatic, the therapist will teach clients strategies to reduce their anxiety sensitivity by challenging these dysfunctional automatic thoughts. Clients will learn how to collect evidence and logically analyze their thoughts using questions such as "What's the worst thing that could happen?", "What are the chances X will happen?", "So what?", and "What else might happen?" The therapist will help the client learn to ask these questions of themselves when they are anxious. In the next session clients will be taught how to replace their negative automatic thoughts with more reasonable and realistic thoughts so they don't fall back on old patterns of thinking.

Over the following two weeks, clients will spend a considerable amount of time practicing the strategies taught in session three; session four will be spent reviewing and continuing with practice.

Timeline for Session 3:

10 min	Introduction: Agenda & Review of Last Session
15 min	Learning to Identify Dysfunctional Automatic Thoughts
15 min	Learning to Identify Thinking Errors
5 min	Homework Assignment and Explanation
5 min	Questions from Client re: Treatment Material for Week

<u>Session Tasks</u>

1) Introduction

- Check in on client completion of homework
    - o If client has not completed homework adequately, the therapist should reiterate its importance. This is particularly important at this stage, because the client will be taught a lot of material in this section that they will need to practice over the week for it to have any effect.
    - o The therapist should review the homework the clients completed with respect to identifying thoughts related to different feelings. The therapist should ensure the client is identifying thoughts and not just feelings.

- Outline session agenda
    - o Therapists should explain to clients that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
    - o Highlight theme of session. The therapist should explain to the client that this session focuses largely on the power of our own thoughts. It is important to present a good rationale for this; for instance, the therapist could discuss how some of the things we fear are more imagined than realized and that we can fear things simply by imaging or thinking about them. It follows then that if we can create fear with our thoughts, we should be able to reduce our anxiety by thought alone. The therapist can explain that this strategy is going to be the focus of this session.
    - o The therapist should outline the four components we are going to cover between this session and the next: identifying their negative thoughts, recognizing the relation between these thoughts and the other components of anxiety, challenging these thoughts, and replacing them with realistic thoughts
    - o Review last session. The key component of last session that should be reviewed is the link between thoughts, feelings, physical sensations, and behaviours. It is a good lead in to the topics in this session and for clients to understand the material for this session they must already be beginning to understand these associations.

2) Learning to Identify Automatic Thoughts

At the beginning of the session, the therapist should briefly review the associations between thoughts, physical sensations, feelings, and behaviours that were introduced the previous week. After the therapist is confident the client understands that our thoughts, feelings, actions, and physical sensations are interrelated, the therapist should bring the focus back to how these relations might contribute to anxiety sensitivity.

Using the strange house scenario (p.78), the therapist can explain to the client how the connection between physical sensations, thoughts, feelings, and actions is intricately tied to anxiety sensitivity and anxiety.

The point that needs to be made to clients is (p.78):

"We augment (turn up) or reduce (turn down) our attention to physical sensations depending on what kind of things we say to ourselves when we experience these sensations. The examples that we have talked about should have given you an idea of the power of our thoughts in contributing to anxiety. Because we know our thoughts are so powerful, it is a good place for us to work on decreasing anxiety sensitivity. There are a number of techniques that can help us challenge the thoughts we tend to say to ourselves. You've read about some of those techniques in the treatment manual and we will talk more about them today. First though, it is important to be able to identify the thoughts that you have when you feel fearful and anxious. Let's work on that now."

The therapist will then introduce the client to dysfunctional automatic thoughts – self-statements made so automatically that one might not even be aware of them. Some key points to cover include (see p.79):

- Dysfunctional automatic thoughts are often subconscious; one might not be aware of them. But at other times one might be very much aware they are thinking frightening things.
- Focus of automatic thoughts could be different between different situations.
- Sometimes it is necessary to search hard to find particular thoughts; it is not enough to identify thoughts such as "I felt terrible" as it is too broad to be helpful. To be helpful, specific dysfunctional thoughts (e.g., what the client pictures happening) need to be identified.

Because they are often subconscious and sometimes hard to identify, the therapist will explain to the client that they are going to work on identifying automatic thoughts using the process on pages 80-81 in the treatment manual. In fact, it may be helpful to explain the three above points in the context of that activity. The therapist should follow the four steps below.

1. The therapist will ask the client to recall a specific incident in which they were anxious and describe it in detail to the therapist.

2. The client will identify at least two thoughts they had in association with the event.

3. Get more specific; have the client define the terms they used to describe their thoughts.

4. Using the more specific terminology, have the client write what their thoughts were in association with the event.

The therapist should tell the client that they will ask them to follow this process again over the course of the next week to practice identifying their specific dysfunctional thoughts.

3) Identifying Thinking Errors

Now that the client is able to identify their automatic thoughts, therapists will move on to teach them why these thoughts might be dysfunctional. It should be noted that continued practice on identifying negative thoughts will be needed, as it can be difficult for clients to identify specific thoughts as opposed to more general thoughts such as, "I feel terrible."

To begin teaching how to challenge automatic thoughts, the therapist must first educate clients about thinking errors. For example:

Therapist: Now that we have talked about how to identify our automatic thoughts, I want to move on to thinking about how we might challenge these automatic thoughts to help reduce anxiety.

Client: Challenging thoughts? I don't understand…

Therapist: It might be a bit confusing to hear that we are going to work on challenging thoughts so let's talk about that a bit. Remember earlier when we talked about being able to create fear just by our thoughts – like we could imagine something frightening happening even if it's never happened before and we can be scared by that?

Client: Yes, I remember, that was when we talked about how powerful thoughts are.

Therapist: That`s right. Thoughts are very powerful. The other thing to know about them is they aren't always accurate or realistic. Everyone has what we call "thinking errors". In other words, they think things that might not be 100% true. So for example, one thing that people often do is overestimate the probability that something terrible is going to happen. For example, someone might be sure that an airplane they are on is going to crash and be very frightened by that even though the chances of their airplane crashing are actually very, very small. Does that make sense?

The therapist will then go on to discuss in more detail the two types of common thinking errors:

1. <u>Catastrophizing</u>: focusing in on the worst-case scenario as a potential outcome; viewing an outcome as dangerous, insufferable, or catastrophic, when, in all probability, it's not (p. 83-84)

2. <u>Probability Overestimation</u>: incorrect prediction of how likely it is for a certain outcome to occur (p. 84-85) *need to explain confirmation bias*

The therapist should explain these two types of thinking errors using the material from the treatment manual on the pages listed above; the therapist should provide lots of examples of each and explain how they are inaccurate and can lead to anxiety. The therapist should also ask clients to think about examples of these thinking errors from their own experience; it might be helpful to use the thoughts identified earlier when working on identifying

dysfunctional automatic thoughts or by referring to other experiences the client has already discussed.

4) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

5) Homework Assignment & Explanation

For this week, the client's homework will be to practice identifying their automatic thoughts and recognizing when and how those thoughts might be thinking errors. They can do this by following the process outlined on pages 81-82 in the treatment manual. This process will walk them through the identification of their thoughts. After identifying their thoughts, the client should then work to identify if their thoughts might be catastrophizing or probability overestimation. Next week they will be taught how to challenge these types of thoughts, but for now they can get some early practice in taking the time to think about their thoughts.

The therapist should ask the client to complete this thought record **at least three times** over the coming week. The first time, the client can use a situation in the past that they remember made them anxious, or they might use a situation that commonly makes them anxious. The second time, the client should work through the thought record with respect to a time when they felt anxious during the week. The therapist should encourage the client to do more than three thought records over the course of the week so they get lots of practice.

Timeline for Session 4:

5 min	Introduction: Agenda
10 min	Review of Last Session & Review of Homework
10 min	Challenging Dysfunctional Automatic Thoughts
5 min	Learning to Substitute Reasonable Thoughts
10 min	Practice Challenging Dysfunctional Thoughts & Substituting Reasonable Thoughts
5 min	Homework Assignment and Explanation
5 min	Questions from Client re: Treatment Material for Week

Session Tasks

1) Introduction

- Outline session agenda
  - o Therapists should explain to clients that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
  - o Highlight theme of session. The therapist should reiterate to clients that the focus of the session is thoughts, continuing the discussion from the previous session.
  - o The therapist should review the four components covered between this session and the previous session: identifying their negative thoughts, recognizing the relation between these thoughts and the other components of anxiety, challenging these thoughts, and replacing them with realistic thoughts.
  - o During this session, the therapist will review what was covered last week through a comprehensive review of the client's homework with respect to identifying thoughts and recognizing the relation between these thoughts and anxiety (see below). Next, the therapist will focus on teaching clients to challenge their thoughts and replace them with more realistic and reasonable thoughts.

2) Homework Review

Homework review will be an essential part of this session as well as the following session. The client's ability to complete their homework properly will be a good sign to the therapist as to how much of the previous session the client actually understood and which parts the therapist and client will need to continue to work on.

Depending on how many thought records the client has completed, the therapist should review them in depth with the client. If the client has completed too many to cover in one session they should just pick one or two to review in depth. The job of the therapist at this point is to walk through the thought identification process with the client to be sure that they are able to identify their thoughts. If the client is struggling to identify thoughts, the therapist may need to review with the client how to identify thoughts. The therapist should offer both assistance and advice as well as positive reinforcement to the client.

Key points to be considered by the therapist:

- When, in relation to the actual situation, did the client complete the thought record? Eventually, with practice, the goal is for the client to be able to identify thoughts as they occur.

- Is the client able to identify exactly what they are thinking/what they are worried about? If the client is presenting broad statements such as "I can't do this" and "I feel terrible", the therapist will have to reinforce the importance of identifying specific thoughts. Socratic questioning will be useful in helping clients figure out what exactly they are worried is going to happen, for instance.

- Even for clients who appear to have identified specific thoughts, it is important for the therapist to be sure there aren't any hidden underlying thoughts not yet identified. For example, a client may say they are thinking that they are going to faint. While on the surface this may seem like a specific thought, it is important to figure out what the client is afraid will happen. Are they afraid of fainting itself? Are they afraid of having negative health-related consequences? Are they afraid no one will find them if they faint at home? Are they worried that people will see them faint and it will be embarrassing? Are they worried they might do something embarrassing when they are semi-conscious? These possibilities must be explored to figure out what outcome the client fears.

- It will be important for the therapist to understand the client's background/experience with respect to this fear. In other words, to use the example above, if the client is worried about fainting the therapist will want to know if they've fainted in the past, if they know family or friends who have fainted in the past, etc. This maybe not be crucial at the thought identification stage but this type of information will become more important when the client begins to challenge their thoughts.

- The therapist should help the client understand which thoughts they are having before, during, and after anxiety episodes.

If the client has not completed their homework adequately, the therapist should reiterate its importance. This is particularly important at this stage, because the skills and strategies being taught will not be effective for the client if they do not learn to use them appropriately and

practice them. By practicing, these skills will become more natural to them, at which point they might actually be able to use them in times of anxiety. Without practice, the skills will not become natural and so will not be helpful to the client.

3) Challenging Dysfunctional Automatic Thoughts

Now that the client knows how to identify negative thoughts and to identify how they are dysfunctional (i.e., thinking errors) the therapist should teach the client how to challenge these thoughts in order to reduce anxiety. **The therapist needs to explain to the client that in order to gain mastery over their anxiety learning to challenge automatic thinking is crucial.**

The therapist might begin by saying:

> *"The primary way to challenge catastrophizing and probability overestimation is by* <u>*examining the evidence*</u>*. Rather than relying on the confirmation bias that we discussed previously, we have to look for information that disconfirms our fears rather than confirms them. We need to closely examine our thoughts to evaluate their accuracy and logic and then must learn to choose the rational thought over the fear-inducing thought. In a sense you will be like a scientist running mini-experiments to gather data and test whether thoughts are correct. We'll treat your thoughts like guesses rather than facts and do experiments to find out if they are true"*

The therapist will then teach the client how to examine the evidence for their thoughts. These points are detailed on pages 86-87 of the treatment manual. Key points to cover include:

<u>Probability Overestimation</u>:

- Importance of acknowledging alternative explanations for a situation/event/feeling, especially because anxiety makes thinking biased.

- To evaluate the evidence for a prediction ask:
  - What are the true odds of this happening?
  - Has this ever happened before?
  - What's the evidence that it won't happen?

- Need to consider all the facts and evidence before predicting the likelihood something will happen. The therapist should use concrete examples to illustrate how jumping to conclusions and not considering all the evidence can lead to inaccurate predictions. For instance, one might be making predictions based on a limited set of past examples overlooking disconfirming evidence. It is common to confuse low probabilities with high probabilities, or think that negative outcomes are certain rather than just possible.

De-catastrophizing

- This is imagining the consequences of the worst-case scenario and then gathering information about the threat to evaluate whether or not there is true danger.

- Involves asking "What's the worst possible thing that could happen?" and "So what if that happened? What would you do? Could you survive?" etc. Often one finds that things are not as catastrophic as they seem.

- The therapist will likely have to address how to appropriately deal with fears of death, as outlined on p. 87.

4) Substituting with Reasonable Thoughts

The last step in this process is to teach clients that once they've identified and challenged their dysfunctional thought they need to replace their negative thoughts with more reasonable, helpful thoughts. This is important because otherwise the client may fall back on their old pattern of thinking. The therapist should use examples of situations and thoughts that were discussed previously, and demonstrate how negative thoughts might be replaced with more useful thoughts.

The therapist might suggest to the client that when they start this process they write down different reasonable and helpful thoughts they might think instead, so this process becomes more helpful.

5) Practice

During the previous two activities, the therapist should have provided and discussed examples with the clients. After having completed both the previous activities, the therapist will practice the whole process with the client using the tables on pages 88-91 in the treatment manual.

The therapist could begin by saying (p.88):

"Let's try to challenge some thoughts commonly associated with anxiety and panic. Then we'll try to challenge some of the thoughts you have when you feel anxious. Remember, after you've challenged a thought, provide yourself with an alternative so that you can replace the automatic thought with a more reasonable and helpful way of thinking."

In order to simplify things for the client, the therapist should emphasize the key questions used to challenge thoughts:
- ➤ What do you think will happen? What's the worst-case scenario?
- ➤ What's the probability? How likely is it to happen?
- ➤ What if it does happen? So what?
- ➤ What else could you think?

These questions cover the basics, and can be elaborated on, as illustrated in the tables (p.88-91), to specific fears.

First, the therapist can work through some of the examples provided in the tables with the client, trying to choose those that are most relevant for the client's anxiety profile.

Second, the therapist and client can examine the evidence for/against some of the thoughts the client identified on their thought records for the previous week. This will involve helping the client come up with the appropriate questions to ask themselves, identifying answers to those questions, and weighing the alternatives they have generated. The therapist should be sure to cover both overestimation and catastrophizing errors.

6) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

7) Homework Assignment & Explanation

For this week, the client's homework will be to practice identifying their dysfunctional automatic thoughts, challenging them, and replacing them with reasonable/realistic thoughts.

They can do this by using the tables outlined on pages 89-91 in the treatment manual. This chart provides them with a place to list their thoughts and examine the evidence. They may need to use more paper; the therapist might suggest making headings/questions that incorporate the lessons learned from last session as well, because the client will likely need continued practice on identifying thoughts.

Clients might consider beginning practice by working to challenge some thoughts they identified in the previous week that were not addressed in session. After this, the client should work to identify thoughts they have during anxious periods in the coming week in order to challenge these thoughts and replace them with reasonable alternatives.

In other words, the therapist might suggest to the client to create their own form with the following questions/subheadings to cover all of the material.

Thought Record/Experiment:

1. Record details of the incident in which you became anxious.

2. Specify at least two thoughts you had in association with the event. You may want to use a thought record form from the previous week to ensure that you are identifying *specific* thoughts.

3. Identify the type of thinking error each thought might be considered (e.g., probability overestimation, catastrophizing).

4. Examine the evidence. List the questions you can ask yourself about these thoughts. You can use the four core questions as your starting point, but remember to elaborate on these questions as we did in session.
    ➢ What do you think will happen? What's the worst-case scenario?
    ➢ What's the probability? How likely is it to happen?
    ➢ What if it does happen? So what?
    ➢ What else could you think?

5. Based on your examination of the evidence, decide whether or not your thought is realistic, true, accurate, etc.

6. Replace any negative, biased, and unrealistic thoughts with more reasonable and logical alternatives. You may start with a list of options and then choose the best alternative.

7. If this situation arises again, try to remember the more logical and reasonable thought that you have identified here.

The therapist should ask the client to conduct thought challenging experiments **at least three times** over the course of the week. It might take the client approximately 10-20 minutes to work thoroughly through one. **The therapist needs to strongly encourage the client to work on these consistently, emphasizing their importance – these skills will only become natural if they get a lot of practice**.

The clients will also be asked to read chapter 7 in preparation for the session the following week.

Chapter 6
SESSIONS 5 & 6: **Interoceptive Exposure**

Objectives for Sessions 5 & 6:

1. Continue to develop the therapeutic alliance.
2. By this point the client should be able to demonstrate an ability to identify dysfunctional automatic thoughts, challenge these thoughts, and replace them with reasonable thoughts.
3. The client should be educated on the maladaptive behaviours often used to manage anxiety (e.g., avoidance, drugs and alcohol, etc.). The client should learn:
    a. how avoidance can perpetuate the anxiety cycle
    b. how distraction can be an effective short-term, but unhelpful long-term, solution
    c. how drugs and alcohol can be a dangerous way to cope with anxiety, leading to more problems in the long-term than they solve
4. The client should learn how changing behaviour can be used to effectively cope with anxiety.
5. Introduce the client to interoceptive exposure. The client should understand what interoceptive exposure involves, its goal, and why it is effective.
6. The client should be taught some common interoceptive exposure techniques.
7. The client and the therapist should have developed a physical exercise interoceptive exposure program for the client to follow over the next seven weeks.

Overview:

Session five will begin with a review of the cognitive restructuring homework assigned in the previous week. It is crucial that therapists do their best to help their clients understand how to identify, challenge, and replace their negative automatic thoughts.

Following this review, sessions five and six will focus on introducing clients to the behavioural component of treatment for anxiety sensitivity. Individuals with anxiety sensitivity often rely on somewhat maladaptive behaviours in order to manage their anxiety. Some individuals rely on distraction, others on avoiding potentially anxiety-provoking situations and situations that might provoke anxiety-related physiological sensations. Others rely on alcohol and drugs. Often these solutions may prove effective in the short-term but only serve to perpetuate the anxiety cycle in the long-term. Some solutions, in fact, are dangerous. One of the main purposes of sessions five and six is to help clients understand how the behaviours they engage in might (a) exacerbate anxiety and (b) cause more problems

in other areas of life. The intention here is to help clients gain insight into behaviours they may be engaging in.

Next, the goal is to teach clients ways to modify their behaviour to help cope with their anxiety. To do this, the therapist will introduce the client to interoceptive exposure (IE) activities – repeated exposure to feared physical sensations as a means of reducing fear of those sensations. IE directs anxiety-sensitive people to attend to their feared sensations, challenge their catastrophic thoughts about these sensations, and habituate to these sensations so they no longer provoke panic or avoidance behaviours. They will explain to the client what IE is, what the goal of IE is, and how it works. They will also introduce the client to a number of different IE activities.

After learning about IE, the therapist and client will develop an IE program for the client. For the purposes of this program, the form of IE the client will engage in will be physical exercise; specifically, running or brisk walking. Physical exercise is used because it induces similar arousal-related sensations to anxiety and is also more real-life than some of the other recommended IE activities. Clients will be asked to run/walk briskly three times a week for 10 minutes each time over the next seven weeks. They will be provided with a heart rate monitor and exercise tracking sheets to monitor their physical exercise. The therapist will also teach them to identify the thoughts and feelings triggered by running and to relate these thoughts and feelings back to their anxious experiences.

Timeline for Session 5:

5 min	Introduction: Agenda
10 min	Review of Homework
10 min	Discussion of Avoidance, Distraction, and Drugs/Alcohol as Coping Mechanisms
10 min	Introduction to Interoceptive Exposure
10 min	Development of Physical Exercise Interoceptive Exposure Program • Includes Homework Assignment
5 min	Questions from Client re: Treatment Material for Week

Session Tasks

1) Introduction

- Outline session agenda
  - o Therapists should explain to clients that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
  - o Highlight theme of session. The therapist can explain that since they have focused extensively on thoughts, this session they are also going to dedicate a good amount of time to focusing on behaviour and how it is related to anxiety and can help to manage anxiety.
  - o During this session, the therapist will review what was covered last week through a comprehensive review of the client's homework with respect to identifying, challenging, and replacing their thoughts with more realistic and reasonable thoughts.
  - o Therapists will introduce interoceptive exposure to clients and help them develop a physical activity plan to meet this treatment goal.

2) Homework Review

Homework review will be an essential part of this session, as it was during the previous session. The client's ability to complete their homework properly will be a good sign to the therapist as to how much of the previous session the client actually understood and which parts the therapist and client will need to continue to work on.

Depending on how many thought records and thought challenge exercises that the client has completed, the therapist should review them in depth with the client. If the client has completed too many to cover in one session they should just pick one or two to review in depth. The job of the therapist at this point is to walk through the thought challenge process with the client to be sure that they are on the right track. If the client is struggling with this skill, the therapist may need to review with the client how to challenge thoughts by working through some examples. It is essential for therapists to ensure clients are replacing negative thoughts with more reasonable thoughts at the end of their thought challenge exercise. The therapist should offer both assistance and advice as well as positive reinforcement to the client.

Key points to be considered by the therapist:

- It should be noted that if the client is still struggling in identifying thoughts, the therapist may have to spend some time reviewing this skill as well. The clients will be unsuccessful in thought challenge activities if they are unable to identify their anxious thoughts.

- Emphasis should be placed on the key questions:
    - What do I think will happen? What's the worst-case scenario?
    - What are the chances it will happen? How likely is it?
    - What if it does happen? So what?
    - What else could I think?

    Also, the therapist should be sure the client is able to tailor these questions so they are appropriate to each situation.

- When in relation to the actual situation, did the client complete the thought challenge exercise? Eventually, with practice, the goal is for the client to be able to challenge thoughts as the occur.

- At this stage, clients may not be able to identify conceivable alternatives to situations that they have seen as black and white or inevitably catastrophic for some time. In this case, the therapist may have to assist the client with brainstorming alternatives and discussing with the client why these alternatives might be possible.

- Some clients may not be able to see why a certain outcome might not be so catastrophic. For instance, someone might see fainting or having a panic attack in public as a horrible and terrible outcome that they would be unable to deal with. In these cases, the therapist can help the client work through this outcome; in other words, some clients may not have thought beyond fainting or the panic attack to what would come next, and the therapist should help the client do this. Also, the therapist may find they are occasionally in the role of a 'myth buster', dispelling beliefs about the harmfulness of certain anxiety symptoms or helping clients research these questions on their own.

- As with the thought identification process, it will be important for the therapist to understand the client's background/experience with respect to their fears. This information is crucial in analyzing the evidence for and against a particular thought as it can lend important information about how the client's background might be contributing to their fear or how it could be used to counteract their worries.

If the client has not completed homework adequately, the therapist should reiterate its importance. This is particularly important at this stage, because the skills and strategies being taught will not be effective for the client if they do not learn to use them appropriately and practice them. By practicing, these skills will become more natural to them, at which point they might actually be able to use them in times of anxiety. Without practice, the skills will not become natural and so will not be helpful to the client.

3) Using Avoidance, Distraction, and Alcohol and Drugs as Coping Mechanisms

After a thorough review of the cognitive component of treatment, therapists will now move onto the behavioural component with their clients. There is a rather quick transition from thoughts to behaviours, which the therapist might explain to the client in this way:

Therapist: By this point we have fairly thoroughly talked about the role of our thoughts in our anxiety experiences and how changing our thoughts can change the way we feel and behave. That is a very important part of this treatment and you will need to keep practicing identifying and challenging your negative automatic thoughts. However, that is not the only thing that we're going to work on in treatment. Do you remember a few sessions ago we talked about anxiety having different components? Do you remember what they are?

Client: I think so. Thoughts was one component…and then there was feelings and physical sensations. I forget the fourth.

Therapist: Three out of four, that's great! Yes, so anxiety is made up of our thoughts, physical sensations, and feelings – and the fourth thing is our behaviour or our actions, so the things we do when we experience anxiety. Often people try to get rid of their anxiety quickly because it isn't a very nice feeling. Does that sound like something you try to do?

Client: Yes, of course, I bet everyone tries to get rid of their anxiety as soon as possible.

Therapist: That's right. And there are a bunch of different ways that people try to do this. Can you think of any things that you or other people might do to try to get rid of anxiety?

Client: Well I guess I usually try to distract myself. Like I would try to think of something else, or maybe turn on the TV.

Therapist: So you would distract yourself. That's something that's very common – a lot of people try to distract themselves from their anxiety….

At this point the therapist would allow the conversation to continue, discussing how distraction, avoidance, and drugs and alcohol are used to deal with anxiety. **The important point to get across is how these solutions might be useful in the short-term but can be destructive in the long-term.**

What follows are key points to cover for each of these three behaviours. Each of these should be differentially emphasized as they are relevant to the client.

Avoidance (p. 94-95)
- Avoidance perpetuates anxiety! It might help to avoid anxiety in the short-term but in the long-term it increases fear.

- Explain how avoidance behaviour helps anxiety become a self-perpetuating cycle: (1) fear increases leading up to an event, catastrophic thoughts become more frequent, and the person starts to feel sick, (2) out of fear, the individual avoids the situations, (3) avoidance means that anxiety rapidly decreases because there is no upcoming situation anymore, (4) this positive reinforcement makes it likely avoidance will happen again when this situation arises.
- A therapist might consider using the anxiety curve to explain how avoidance does not allow us to experience the inevitable reduction in anxiety, but instead serves to increase anxiety when the situation arises again

Anxiety gets higher, faster each subsequent time the situation is faced.

ANXIETY LEVEL

Anxiety decreases immediately after avoidance

Normal course of anxiety

TIME
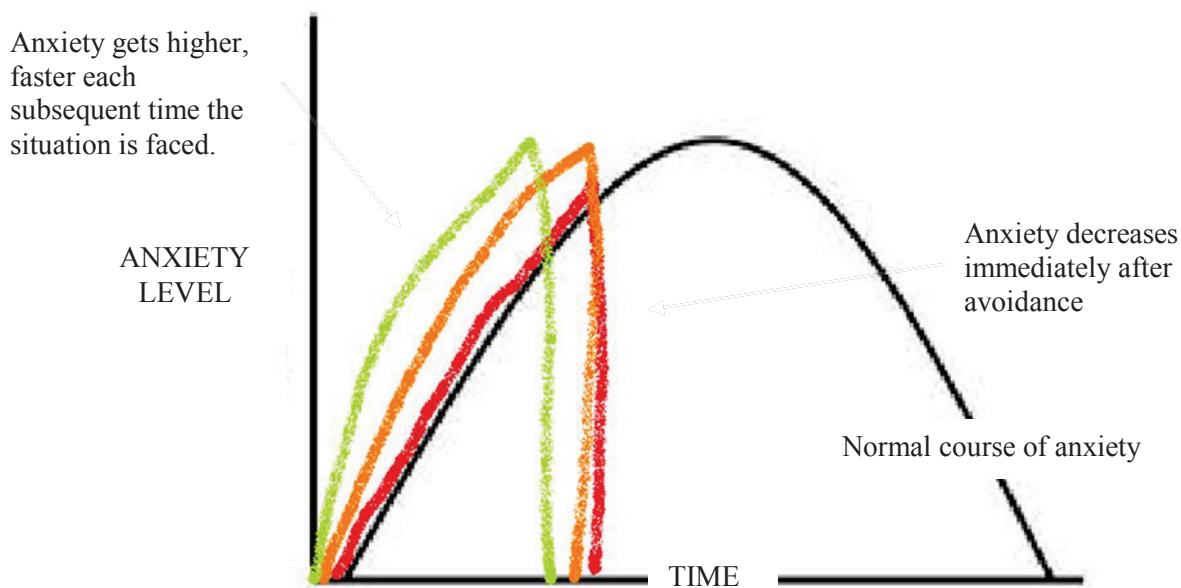
- Typically, people avoid situations where escape might be difficult or help unavailable. BUT some people also tend to avoid things that bring on anxiety-related sensations like coffee, exercise, anger, or sex.
- Examples and case vignettes from p. 94-95 will be useful in this explanation.
- Questions on p. 94 can be used to help the client relate to the material.

Distraction (p.96)
- Distraction can be both internal (focusing on neutral or pleasant thoughts) or external (engaging in activities that divert attention away from worries).
- Distraction is not the same as avoidance because it helps you stay in the situation rather than opt out of it.
- It is very common, and can be very effective – client can provide examples from their life.
- Distraction is not helpful in the long-run because it doesn't change the fear of arousal-related sensations. Also, people might come to depend on distraction techniques, needing them to get through a situation.

Drugs and Alcohol (p.96-99)

- Drugs and alcohol are a dangerous way to cope with anxiety.
- 1/3 to ½ of people with drug and alcohol problems began taking drugs or drinking alcohol to 'self-medicate' their anxiety.
- Drugs and alcohol may work in the short term to reduce anxiety symptoms or to enhance psychological well-being (i.e., they may relax you, make you forget your problems, or give you courage to interact in social situations). However, dependence and tolerance develop quickly. This means that a person needs more of a drug or more alcohol to get the same effects; in other words, as consumption increases the anxiety-reducing properties of substances decrease.
- Drugs and alcohol actually increase anxiety and depression over time. Similarly, the risk for addiction and reliance on the substance to function increases over time as well.
- The therapist will likely already have some information about the client's drug use; however, they might consider administering the questionnaire on p.98 to determine how much this is a problem in their client's life.

4) Introduction to Interoceptive Exposure

Now that the therapist and client have discussed some maladaptive ways to deal with anxiety it is time to talk about more useful things the client could do to help them cope with anxiety. The therapist might say:

"So now we've decided that while avoidance, distraction, and drugs and alcohol might help us deal with anxiety in the short-term, in the long-term they tend to make our anxiety worse and can actually be dangerous. So what can we do instead of avoid, distract, and drink? Well one thing we can do to change our response to anxiety is to change our behaviour – we can learn 'to be in anxiety'. What I mean by that is we can learn to experience anxiety but lessen our fears of the sensations associated with anxiety. This probably sounds difficult, but we have found ways that work to help people learn to experience anxiety without being so afraid of it. Research has shown us that one of the best ways to learn 'to be in anxiety' is called interoceptive exposure…"

The therapist would then proceed to explain to clients what interoceptive exposure is and introduce clients to interoceptive exposure techniques.

The therapist should answer the following questions for the client using the material on p.99-101:

1. What is interoceptive exposure?
   - ➢ *Repeated exposure to feared physical sensations like increased respiration and heart rate as a way to reduce fear of those sensations. In other words, we would do exercises that would make you feel physical sensations similar to those you experience when you're anxious so you learn to deal with them positively.*

2. Why would you do that?

> ➢ *Interoceptive exposure exercises cause you to face feared sensations. So for example, if you were someone who was worried about feeling dizzy when you became anxious, you might do an exercise that involved spinning around very quickly while you're standing. Likely you would feel dizzy after doing this exercise, just as you would when you're anxious, and so you would be told to pay attention to that feared sensation. Then we work to challenge any catastrophic thoughts you are having about that physical sensation. Ultimately we would work to help you accept your anxiety experiences so that when you experience these physical sensations in your day-to-day life they wouldn't lead you to panic or avoidance behaviours.*

3. What is the goal of interoceptive exposure?

> ➢ *The goal of interoceptive exposure is habituation. Habituation is something that happens to us when we've been exposed to something many, many times. So for example, say you are trying to sleep in a new place. You would probably notice all of the different sounds that are going on when you're trying to sleep because they are all new sounds you're not used to when you're trying to sleep. So you might sit up or maybe open your eyes every time you hear a sound. But after a while you get used to the sounds and you don't respond to them anymore and you are able to sleep. This is what happens with interoceptive exposure. At first, the sensations that you experience are scary and you notice them all the time. However, after a while, you'll get used to them and they won't bother you anymore.*

4. What are different interoceptive exposure techniques?

> ➢ *There are a lot of different techniques we use for interoceptive exposure.* (The therapist could refer to the list on p.102 with the client and discuss how these exercises induce the symptoms in the second column.)

5) Development of Physical Exercise Interoceptive Exposure Program

In this section of the session, the therapist will explain the physical exercise homework to the client. The therapist should explain to the client that the interoceptive exposure exercise that is used in this treatment is running/brisk walking and that over the next seven weeks they will be asked to run for a short period several times a week. **Because running/brisk walking may come across as a very aversive activity to a client, a strong rationale for interoceptive exposure must be presented in the previous section and may need to be reiterated here with respect to running in particular.**

Important points to be covered by the therapist about the running interoceptive exposure:

- Running/brisk walking triggers the same physical sensations we experience when anxious. The therapist might ask the client to help them explain this point. For instance, they might ask the client:
    o What sensations do you experience when you run/walk briskly?
    o Do you see the similarities between the sensations we experience when running/walking briskly and when we're anxious?
    o Do you see how running/brisk walking works like the other interoceptive exposure exercises we talked about?

- Running/brisk walking is considered by some to be a more real-to-life interoceptive exposure exercise than activities like chair spinning and breathing through a straw.

- The therapist must emphasize to clients that running/brisk walking is considered safe, even advisable, for people with anxiety disorders.

- Running/brisk walking as an interoceptive exposure technique is particularly important for those with high anxiety sensitivity. Many highly anxiety sensitive people avoid activities that induce arousal-related body sensations – like exercise, but also like coffee or even sex. One possible reason is that these activities induce sensations similar to anxiety. (Additional information on p. 122-126).

Then, the therapist will explain the process of the running/brisk walking program to the client.

Practicalities:
- The client will be asked to run **3 times a week, 10 minutes each time**. If running is too much, the client could do a fast-paced walk. GOAL = increase heart rate!
- It is important that the client's heart rate is raised when they are exercising. To ensure this, the client will wear a heart rate monitor. The therapist will have to explain to the client how the heart rate monitor works (see instruction sheet, the client will also have a copy of the instruction sheet). The therapist should help the client calculate their target heart rate range (220 – age = maximum heart rate; 60-80% of this number is the target heart rate range).
- After each running/brisk walking session the client will complete the exercise running log. The therapist can work through the form with the client on the phone.
- Participants are welcome to run/brisk walk outside, to use a treadmill, or to engage in aerobic exercise on an elliptical machine.
- Participants are asked not to use music devices (e.g., iPod, MP3 player) while running/brisk walking so they are not distracted and can be aware of their bodily sensations.

During the running/brisk walking, participants are encouraged to (a) identify the physical sensations they are experiencing (these are also assessed on the exercise logs), and (b) identify the automatic thoughts and feelings triggered by these physical sensations. The therapist should explain to the client that with time and practice, clients will habituate to the physical sensations associated with arousal.

A number of clients may not have engaged in physical exercise for some time; as such, it is important for the therapist to prepare the client for what to expect with physical exercise. The therapist and client should discuss the physical sensations the client might expect to experience when running/brisk walking. They should also work to anticipate some of the thoughts the client might have when they experience these sensations and what the client will do when this occurs. Likely this will involve thinking back through the thought challenge exercises of the previous several weeks. The therapist should encourage the client to do additional thought challenge exercises in the coming weeks as appropriate. At this stage, the therapist should take the time to address all the concerns raised by the client about exercising to proactively deal with any barriers that might arise in the coming week. **The therapist must be sure the client understands the homework assignment and is comfortable enough with it and with the rationale behind it to be willing to try it.**

The therapist should also work with the client to anticipate barriers to homework (specifically physical exercise) completion. The therapist might ask the client, "Can you think of any reasons why it might be difficult for you to complete the physical exercise homework over the next week?" If the client endorses anticipating some difficulties (i.e., time, place to exercise, motivation, etc.) the therapist should problem-solve with the client to increase the chances that the client will do the homework over the next week.

Given that the heart rate monitors are sometimes less than reliable, therapists can also teach clients how to find their own pulse. The following website might help in this regard: http://www.cchs.net/health/health-info/docs/0900/0984.asp?index=5508

6) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

Timeline for Session 6:

5 min	Introduction: Agenda
15 min	Review and Discussion of Running Homework
10 min	Benefits of Physical Exercise beyond Interoceptive Exposure
10 min	Troubleshooting
5 min	Homework Assignment
5 min	Questions from Client re: Treatment Material for Week

Session Tasks

1) Introduction

- Outline session agenda
    - Therapists should explain to clients that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
    - Highlight theme of session. The therapist can explain that this session will focus largely on reviewing the physical exercise homework they completed over the past week and discussing its implications for anxiety sensitivity.
    - During this session, the therapist will also spend some time troubleshooting; in other words, there will be time to focus on a treatment issue or concept that the client has struggled to grasp in previous sessions. For example, they might spend some time working on thought challenging activities.

2) Review and Discussion of Running/Brisk Walking Homework

A significant portion of this session will be spent reviewing the physical exercise program the client began the previous week. It is important for the therapist to (a) make sure that the client completed the homework, (b) follow-up on their experience, with particular focus on thoughts and feelings, and (c) address any continuing concerns the client might have about engaging in the program. Each of these components is discussed in further detail below. It is also important for the therapist to inject enthusiasm and encouragement into the session to help motivate the client to continue with the running homework.

a. Ensure completion of homework.

The therapist must first ensure the client completed the physical exercise assignment. They also need to collect details about the practicalities of the client's experience. The following questions are appropriate in this situation. The client may rely on their exercise log sheets to remind them of their experience.

- ➢ Were you able to complete the running/brisk walking assignment over the past week?

➢ Did you run or walk quickly?
➢ How many times did you run/walk?
➢ How long did you run/walk each time?
➢ What was your average heart rate each time you ran/walked? Was this in your target heart rate range?
➢ Did you run/walk outside, on a treadmill, on the elliptical, etc.?
➢ Did you run/walk on your own or with someone else? Did you use music? (The therapist might consider encouraging the client to minimize the distractions while they are running/walking.)

If the client did not complete the homework as assigned, the therapist must troubleshoot with the client in order to overcome any barriers to homework completion. The therapist might investigate the following:

➢ Did the client lack motivation to complete the homework?
➢ Did the client avoid the homework out of fear of the physical sensations associated with physical exercise?
➢ Did the client find it difficult to fit the running/walking into their daily schedule?
➢ Was the client's physical environment conducive to running/walking?
➢ Did the client not understand the importance or not accept the rationale behind the physical exercise as an interoceptive exposure activity?
➢ Is the activity taking place in bad weather conditions (snow, rain, etc.)?

Investigating these different options (and certainly there may be others to consider), will allow the therapist to help the client develop a program that works for them. For instance, the therapist might help the client problem-solve what time of the day they might fit in the run/walk or where in their neighbourhood they might run/walk. Alternatively, the therapist might make a definite plan with the client as far as what days and times the client is going to run/walk in the next week. **The ultimate goal is to figure out what it will take to get the client to engage in the homework the next week.**

b. Follow-up on client's experience, with particular focus on thoughts and feelings

Using the client's exercise log and their memory, the therapist should then review the client's experience with the running/brisk walking over the past week. They should thoroughly discuss the physical sensations the client experienced while running/walking and the thoughts they had before, during, and after running/brisk walking.

The therapist might begin this discussion with a simple conversation about whether the client did or did not enjoy the running/brisk walking experience. This will give the therapist some insight into the client's experience that can be used later in discussing their thoughts and feelings.

Subsequently, the therapist should ask the client what physical sensations they experienced while running/brisk walking. The clients have completed the Hyperventilation Questionnaire each time they ran/walked so they can refer to that form to remind themselves; however, the

form focuses largely on thoughts the client might have been having while running/walking. This is also important, but will be the second step in discussion. As such, the therapist should also ask the client to think about particular physical sensations they experienced when running/walking and how these sensations are similar or different than those the client experiences when anxious. Below is an example of such a conversation:

Therapist: Let's talk about how you felt when you did the running/walking exercises over the past week. I'd like to talk first about what kind of physical sensations you experienced while you were running/walking. You might not be able to remember all of them, but think about some feelings that were typical when you were running/walking.

Client: Well, I got very hot each time and sweated a lot. And I remember my heart rate would go up and I would be breathing pretty heavy.

Therapist: Ok, it sounds like you experienced some sensations that most people experience when they exercise. You got hot and sweaty and your heart rate sped up and you were breathing quickly. Why do you think those things happen when you run/walk briskly?

Client: Umm…because you're working hard?

Therapist: Because you're working hard – that's right! Your body is working harder than it usually does because it needs more energy to run/walk briskly than it does to walk normally or to sit. So your heart pumps faster to keep the blood moving to your muscles and you breathe more quickly because your lungs are using the oxygen you bring in to power your body. And your sweat is actually your body's way to keep you from overheating. So when we think about it, there is a scientific reason for each of those sensations that your body is experiencing.

Client: Ok.

Therapist: So, let me ask you this. How are those feelings that you experienced while running/walking similar to those you have when you're anxious?

Client: Well actually I think they're a lot the same. Because when I get anxious I usually have trouble breathing and my heart beats really fast. Sometimes I worry that people will see me sweating. So I guess they're actually almost identical feelings.

Therapist: So they're almost identical feelings. That's interesting. Well we decided that when you experienced those things when you were running/walking that was because your body was working hard. What about when you're anxious why does your body do those same things?

Client: Well maybe because you're working hard again? I remember we talked about how when you get anxious your body works hard to prepare you for danger.

Therapist: Your body does work hard to prepare you for danger as well, you're right. So we know that in both cases – physical exercise and anxiety – our bodies are working really hard and so we experience these things like racing heart, breathlessness, and sweating. This is something very important to remember – that when we experience these sensations there is a reason for them. When you exercise and you feel your heart rate race you are able to say to yourself, that's ok, I know my heart rate is just racing because my body is working hard. The same thing should be true when you feel your heart racing at other times. Then you can say to yourself, it's ok, I know that my heart rate is racing because I'm anxious right now. There's a reason for why I feel this way. Does that make sense?

Client: Sort of, yes. But just because there's a reason for it doesn't mean it's not going to have bad consequences.

Therapist: Ok, that's a good point, let's talk about that a bit then. We said when you were running/walking briskly you experienced things like breathlessness and a racing heart, right?

Client: Yes, exactly.

Therapist: Alright, well I want you to think about how you felt one minute after you finished your running/walking. What did you notice about your heart rate and your breathing?

Client: Well after I stopped they didn't get any worse. I mean, my heart was still racing and I had trouble breathing but it wasn't getting worse.

Therapist: It wasn't getting worse. Great. Ok, what about 5 minutes after you finished running/walking – then how were you feeling?

Client: Well by 5 minutes after I was feeling a lot better. My heart was still racing a bit but my breathing was totally back to normal.

Therapist: So 5 minutes after running/walking briskly you were feeling a lot better. Those physical sensations weren't nearly as strong as they were before. That's a very important observation and something very important to remember! Even after we experience these physical sensations that seem pretty intense in the moment, after some time they seem to decrease. What's interesting to know is that the exact same thing happens when you're anxious. We've talked a little bit about this before. This happens because it is impossible for our body to keep those intense physical sensations going for a long time – they all will stop eventually because we simply don't have enough energy in our body to keep them going.

Client: Really? They'll always go down?

Therapist: Exactly. Think of it just like when you're running/walking briskly. Your heart rate goes up when you're exercising but afterward it starts to go down. The

same thing happens when you're anxious – you might immediately feel your heart racing, but after a while it will start to go down again. It's the natural course of anxiety, your body is programmed to be that way. It simply can't keep those high intensity physical sensations going on for a long time.

The therapist can continue along this vein, drawing parallels between the physical sensations experienced while running/walking briskly and those experienced while anxious.

It is also important for the therapist to talk with the client about the thoughts they had while exercising. This can be tapped into using the Hyperventilation Questionnaire the client filled out after each running session. The therapist can use the list below to indicate which were the most common things experienced by the client while running.

Breathlessness
Feeling distant
Fear
Feeling trapped or helpless
Anxiety
Rising agitation
Feeling of suffocation
Dizziness
Feeling of losing control
Worrying that actions are damaging to your health
Blurred vision
Weakness
Nervousness
Racing heart
Feel like passing out
Fear of a heart attack
Tension
Feel like panicking

The therapist should help the client identify the specific thoughts they were having with respect to these feelings. For instance, for a client who felt like passing out, what were they thinking at that moment? Possibly, "I am worried I am going to pass out". Then, the therapist could engage in a thought challenge activity with the client.

- o What do I think will happen? What's the worst-case scenario?
- o What are the chances it will happen? How likely is it?
- o What if it does happen? So what?
- o What else could I think?

It would be advisable to use evidence collected from the client's running/walking experience to challenge those thoughts. For example, did the client pass out while they were running/walking?

c. Address any continuing concerns the client might have about exercising

It may be that by this point the therapist has already addressed any concerns the client has about exercising. They will already have tackled the practicalities of the running/walking (part a) as well as the feelings and thoughts that accompany the running/walking (part b). Any concerns the client has will likely arise during those sections.

However, before moving on to the next section, the therapist should ask the client if they have any other concerns about continuing the exercise program for the next week and then help address these fears appropriately.

3) Benefits of Physical Exercise Beyond Interoceptive Exposure

In order to increase the client's motivation to engage in the physical exercise component of treatment as well as to further their understanding of how the physical exercise component works, it will be helpful for the therapist to discuss the more global benefits of physical exercise with the client. This should be a conversation with the client in which they are invited to offer ideas about possible benefits of physical exercise which are then supplemented by the therapist's knowledge.

Benefits of physical exercise (p.121-122):
- Helps prevent and rehabilitate many disorders including coronary artery disease, hypertension, diabetes, coronary obstructive pulmonary disease
- Improves psychological conditions such as anxiety, depression
- Enhanced mental performance and concentration
- Improved self-image
- Feelings of confidence and perceptions of mastery
- Greater sleep quality
- Reduction in perceived feelings of anger, time pressure, urgency

The therapist can also explain to the client how the release of endorphins is involved in an increase in positive affect (see p. 122 in the treatment manual).

Finally, the therapist should engage the client in a discussion about the amount of physical activity appropriate for them. The 'How much exercise do you do' questionnaire on p. 127 can be used to give clients insight into their own physical exercise habits and how they compare to Health Canada's advice (p.126).

4) Troubleshooting

Given the rapid pace this treatment program follows, this section gives the therapist some freedom to explore any areas of treatment up to this point that the client has been struggling with and thus deserve more attention. At the therapist's discretion they could choose to spend some time working on thought identification, thought challenging, or extending discussion around the physical exercise interoceptive exposure component of treatment. The therapist can refer to the previous sections in the treatment manual on their specific topic of focus for content to use.

5) Homework Assignment

As likely stated previously, the client will continue with physical exercise 3 times for 10 minutes each time over the next week. Exercise logs should be completed after each session. Also, it may help clients to complete thought challenge exercises, so the therapist should encourage the client to complete those if appropriate and helpful. The therapist might help the client think of some times when it might be helpful to complete a thought challenge activity.

In addition, the client's homework for the coming week is to read Chapter 8 of the treatment manual. They should record any questions that come up during their reading so they will remember them during the therapy session.

The therapist should tell the client briefly what the content of next week's reading and session will be and tell them to consider which parts of the reading are the most relevant to their situation. For instance:

"Alright, well it looks like we have finished up for today. This week, I'll ask you to read Chapter 8 from the treatment manual. This chapter talks about ways to adopt healthy-lifestyle habits that can help manage stress more effectively. When we are under stress often our anxiety becomes more frequent and intense. By finding easy ways to manage stress effectively we can work to manage our anxiety as well. When you are reading through the chapters I want you to think about which parts might be most relevant to you, and which lifestyle habits you think are most interesting or might be most helpful for you. We'll talk about this next week. Any questions?"

6) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

Chapter 7
SESSION 7: **Stress Management**

Objectives for Session 7:

1. Continue to develop the therapeutic alliance.
2. By this point the client should be regularly following the physical activity interoceptive exposure program.
3. The client should develop an understanding of stress and the General Adaptation Syndrome.
4. The client should be able to identify how stress and anxiety sensitivity might be related.
5. The client should come away with ideas about different ways to adopt a healthy lifestyle, with particular focus on:
   a. nutrition
   b. rest and sleep
   c. physical exercise
   d. breathing
   e. humour
6. Through self-assessment, the client should recognize what major and daily stresses they are facing and how these stressors are affecting their functioning and daily satisfaction.

Timeline for Session 7:

5 min	Introduction: Agenda
5 min	Review and Discussion of Running Homework
10 min	Introduction to Stress and the General Adaptation Syndrome
5 min	Anxiety Sensitivity and Stress
20 min	Identifying Healthy Lifestyle Habits
5 min	Questions from Client re: Treatment Material for Week & Homework Assignment

Overview:

By this point in treatment, the therapist will have equipped the client with a number of cognitive and behavioural skills to help them challenge their thoughts and adapt their responses to anxiety that will help them reduce their anxiety sensitivity. At this point then, the goal is to help clients adopt healthy lifestyle behaviours aimed at reducing their stress levels and helping them manage what stress they do have effectively. This section of treatment is aimed at ensuring clients maintain good health so they have the cognitive and physical resources needed to tackle anxiety should it arise.

This session will focus, first, on stress (what is it, how we respond to it, how it affects us) and its relation with anxiety sensitivity. Clients will be introduced to the alarm, resistance, and exhaustion stages of the General Adaptation Syndrome. The clients will also be given the opportunity to think critically about the major stressors and daily hassles present in their lives at the moment. The therapist will also explain the vulnerability-stress model to clients, which suggests that mental health problems arise from a combination of vulnerability factors, such as anxiety sensitivity, in the context of life stress. In fact the combination of high anxiety sensitivity and stress significantly predicts panic attacks and agoraphobic avoidance.

The second focus of this session will be to assist clients in developing ideas of how they might change their lifestyle behaviours to increase health and reduce stress. The therapist will explain how our bodies work best with proper nutrition, good breathing techniques, daily exercise, and rest and sleep. We need to be constantly monitoring these things or our bodies will malfunction. During this session, the therapist will help the client assess their existing healthy lifestyle behaviours in these areas and determine how they might work to improve their healthy habits. This will help reduce stress, with long term implications for decreasing anxiety.

Session Tasks

1) Introduction

- Outline session agenda
    - Therapists should explain to clients that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
    - Highlight theme of session. The therapist can explain that the session will focus on stress, stress management, and healthy lifestyle behaviours today.
    - During this session, the therapist will also spend some time reviewing the client's engagement in the physical exercise interoceptive exposure component of treatment.

2) Review and Discussion of Running Homework

As this would only be the end of the second week the client has engaged in the physical exercise interoceptive exposure component of treatment it is necessary to once again review the client's experience with the running homework. The review in this session will not be nearly as comprehensive as the review conducted in the previous section. However, the therapist should briefly discuss the following details with the client.

The therapist must first ensure the client completed the running/walking assignment. They also need to collect practical details of the client's experience. The following questions are appropriate in this situation. The client may rely on their exercise log sheets to remind them of their experience.

- Did the client complete the running/walking assignment over the past week?
- How many times did the client run/walk? How long each time?
- What was their average heart rate each time they ran/walked? Was this in their target heart rate range?
- Were there any changes from the previous week?

If the client did not complete the homework as assigned, the therapist must troubleshoot with the client in order to overcome any barriers to homework completion as they did in the previous session. The therapist might investigate the following factors:

- Lack of motivation
- Fear of physical sensations
- No time
- Non-conducive environment
- Bad weather

Investigating these different options (and certainly there may be others to consider), will allow the therapist to help the client develop a program that works for them. For instance, the therapist might help the client problem-solve what time of the day they might fit in the run/walk or where in their neighbourhood they might run/walk. Alternatively, the therapist might make a definite plan with the client as far as what days and times the client is going to run/walk in the next week. **The ultimate goal is to figure out what it will take to get the client to engage in the homework the next week.**

Finally, the therapist should review and discuss with the client the thoughts and feelings they experienced while running. Particular focus should be given to any realizations the client may have come to about the physical sensations and any positive or negative consequences they are experiencing, any changes in experience from the previous week, and any continuing concerns the client might have. These topics are best explored through a brief conversation with the client; however, please refer to the activities used in the previous session if more in-depth discussion of thoughts and feelings is required.

3) Introduction to Stress and the General Adaptation Syndrome

Up to this point the therapist has given the client cognitive and behavioural skills to help target anxiety sensitivity directly. Now, the treatment progresses to provide clients with some healthy lifestyle skills to more generally help reduce stress in their lives and teach them to manage stress more effectively. The therapist can introduce this topic in this way (p. 109):

"Over the past couple of sessions we've looked at how changing the way we think and the way we behave can help us manage our anxiety more effectively. Now, we're going to change topics a bit and talk about how establishing healthy lifestyle habits can help us manage stress more effectively. This is important because, as we'll talk about, high levels of stress in combination with high anxiety sensitivity can lead us to experience anxiety and other mental health problems. So we want to be able to keep our stress levels low. Today we'll talk about why that's important and how we can do that. Any questions? [...] To start, let's talk a little bit about what stress is."

The therapist will begin this discussion by ensuring the client understands what stress is. The therapist might make this conversation more interactive by asking the client how they would explain stress and whether they think they experience a lot of stress in their life. This is just a brief introduction to stress; later in the session the client will have the chance to talk about the specific stressors they face and their effect on functioning and satisfaction.

The client should understand that stress can result whenever we're faced with external changes or demands. The therapist and client can work together to identify different events that might result in stress (e.g., noisy environment, argument with partner, loss of job, vacation, illness, etc.) – and the therapist can convey to the client that these events are commonly called **stressors** because they are things that cause stress.

The therapist will then briefly explain the General Adaptation Syndrome to clients to explain how our body responds to stress. The conversation might go something like this:

Therapist:	Basically, there are three stages that our body goes through when we're exposed to a stressor. Like we discussed, a stressor is something in the environment that might cause us stress. So the first stage we go through is the alarm stage. That is when our body goes through the 'fight or flight' response. We talked about the fight of flight response a bit before – do you remember?
Client:	Sort of. I think we said that if our body senses danger it gets ready to face the danger or run away from it.
Therapist:	That's right. So our body prepares us to deal with the situation, which means that it often makes our muscles work really hard but our digestive system doesn't work very hard because it's not really needed in a threatening situation. This is the stage when we experience all of those physical sensations we talked about that go along with anxiety. So let's use an example to make this all clear. Let's say that I was just laid off from a job. This is a threatening situation for me, right, because it would generate a lot of worries about how I was going to find money to support myself.
Client:	Yes for sure losing your job would be very stressful.
Therapist:	Great, so we agree that losing a job would be stressful. So the first thing that would happen when I lost my job was that I would go through the alarm stage – my body would go on high alert and start working overtime. My heart might start racing and I might start shaking and I would be very worried. Then, after the alarm stage, my body would go through the resistance stage. In this stage my body starts to adapt to the stress and fights to keep up with the demands that I'm putting on my body. So I might be staying up late at night worrying or driving all over the city trying to find a new job and putting in calls to all of my friends to try to get a connection to work. So my whole body would be working really hard trying to keep up with everything I was asking it to do. Is this making sense?
Client:	Sure, I think so. First you'd have this immediate physical anxiety response and then you'd be on overdrive doing all kinds of things to try to deal with the situation.
Therapist:	Exactly. So then the final stage that happens with stress is the exhaustion stage. In this stage our bodies are struggling because we are asking them to do too much and function at such a high level that it just can't do it anymore. At this stage I would start to feel the toll stress was taking on my body and I would be tired a lot and maybe in a bad mood.

In addition to these three stage of stress the therapist should also cover some more key points about stress with the client (see p.110-111).

- Alarm stage as most relevant for high anxiety sensitivity
- Difference between positive and negative stressors
- Daily hassles vs. major stressors

Next, the therapist should help the client do an assessment of the stress in their life and the effect it has on their life. This can be done using the activities on p. 111 (identifying major sources of stress and daily hassles) and p. 113-114 (assessing their stress level and its effects). This discussion should finish by letting clients know that later in the session they will discuss ways to help reduce stress and keep our bodies healthy and ready to deal with stress when it arises.

4) Anxiety Sensitivity and Stress

In this section, the therapist should help clients understand the particular relationship between stress and anxiety sensitivity. There are two main points to convey.

1. The therapist must reinforce to the client the importance of managing stress, particularly for those with high anxiety sensitivity. Clients need to know that research shows that the combination of high anxiety sensitivity and exposure to stressors predicts anxiety, specifically panic and agoraphobic avoidance.

2. Clients also need to know, though, that research shows that having high anxiety sensitivity causes an individual to view life situations as more stressful. In other words, a person with high anxiety sensitivity is likely to view stressors as *more stress-inducing* than those with low anxiety sensitivity. This means that while it is important to manage stress and keep our bodies healthy, it is just as important to target anxiety sensitivity levels, as we've been doing with the past cognitive and behavioural exercises.

5) Identifying Healthy Lifestyle Habits

So all this talk about stress will likely leave clients feeling a bit stressed out themselves! This means it is time for the therapist to help the client recognize ways they can work to manage stress effectively. In this section the therapist has three goals:
a) Explain to the client why healthy habits are important,
b) Assess the client's current use of healthy habits, and
c) Help the client identify areas where they could improve healthy habits

The therapist could start this section with:

"We've talked a lot about stress now. We know that we can't avoid stress – it'll be in our lives whether we like it or not. Because stress will always be there, it's important for us to learn better ways to tolerate stress and manage it more effectively. Research tells us that one way to manage our stress better is to work on our anxiety sensitivity; which is what we've been doing over the past several weeks. What we're going to talk about now is a way to help our bodies tolerate stress – we know that good stress management depends on a healthy body. So for the rest of the session we're going to talk about ways that we can make sure that our bodies are healthy so they are best prepared to deal with stress when stress arises. If we neglect our bodies by doing things like not exercising, not eating right, or not getting enough sleep it becomes harder for us to manage stress. You can think of your body

like a car; if we don't do regular maintenance on the car – like changing the oil or rotating the tires – it won't function the best that it can. You may already do a lot of things to keep your body healthy, so we'll talk about those, and hopefully we'll come up with some new healthy habits you might be able to adopt."

At this point the therapist should discuss the following healthy habits with the client. They can use the exercises provided in the book to do a thorough assessment of the client's current healthy habits and to find areas where the client might improve. Only the main points are mentioned below, the therapist should refer to the appropriate pages in the treatment manual for the comprehensive material to cover.

Before beginning this assessment, the client should complete the Vehicle (Body) Maintenance Checklist on p.115 to see where they think they are doing well with healthy habits and where they think they could improve.

Nutrition (p. 116-118):
- Follow Canada's food guide: http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php
- Balanced diet (does client feel there is a certain food group they are missing?)
- Go over points listed on the chart on p. 116-118 about food groups to avoid and those to indulge in, amounts of food to eat, and points about water and alcohol intake
- The therapist should make this interactive by asking the client if they do or do not follow the different points

Breathing (p.118-121)
- Might seem silly to talk about but is linked directly to stress and health
- Stress can influence breathing; in the short-term it can lead to hyperventilation, in the long-term it can result in inhibited breathing with negative health consequences
- Important to maintain proper breathing – test if the client is doing so on p. 120
- **Explain diaphragmatic breathing and why it is important. The therapist could spend some time on this important strategy and practice with the client over the phone.

Physical Activity (p.121-128)
- Because there has already been extensive discussion about physical exercise, the therapist should just remind the client of its importance and inclusion in a healthy lifestyle, then move on to the next point.

Rest and Sleep (p.128-131)
- Emphasize importance of sleep (on average 7 hrs/night needed); see 3 points on p.129
- Discussion of negative consequences of loss/lack of sleep
- Sleep problems associated with anxiety

- The therapist should get an idea of any difficulties the client is having with sleep. Then they should discuss good sleep hygiene with their client and determine how the recommended habits are similar to or different than their current routine.

Humour (p.131)
- Humour reduces anxiety brought on by stress; humour makes people less afraid
- The therapist should emphasize the science behind this so the client is more likely to believe it as true rather than a nice anecdote.

6) Homework Assignment

As stated previously, the client will continue with running 3 times for 10 minutes each time over the next week. Exercise logs should be completed after each session. Also, it may help clients to complete thought challenge exercises so the therapist should encourage the client to complete those if appropriate and helpful. The therapist might help the client think of some times when it might be helpful to complete a thought challenge activity.

In addition, the client's homework for the coming week is to read Chapters 9 to 11 of the treatment manual. They should record any questions that come up during their reading so they will remember them during the therapy session.

The therapist should tell the client briefly what the content of next week's reading and session will be and tell them to consider which parts of the reading are the most relevant to their situation. For instance:

"Alright, well it looks like we have finished up for today. This week, I'll ask you to read Chapters 9, 10, and 11 from the treatment manual. I know that sounds like a lot, but the last chapter is simply someone's story about their experience with anxiety sensitivity and treatment. The other chapters talk about preparing you to use the skills we've worked on here in your everyday life. We'll also discuss how to continue to change and implement your healthy lifestyle behaviours after treatment and how to reduce the risk of falling back into familiar ways of thinking and behaving. Like always, I want you to think about which parts might be most relevant to you, and which lifestyle habits you think are most interesting or might be most helpful for you. We'll talk about this next week. Any questions?"

7) Questions from Client re Session Content and Manual Material

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

Chapter 8
SESSION 8: **Relapse Prevention & Extending Treatment Gains**

Objectives for Session 8:

1. By this point the client should be regularly following the physical activity interoceptive exposure program.
2. The client should come away with an understanding that lapses into old patterns of thinking and behaving are often inevitable, but that there are strategies they can use to avoid lapses becoming relapses.
3. The client should be able to identify their own high risk situations and the triggers for relapse that may be most salient for them.
4. The client, with the therapist's help, should develop a plan to deal with high risk situations and triggers in order to avoid relapse.
5. The client should feel prepared to continue the exercise program initiated in session four for several more weeks with less frequent therapist contact.
6. The therapist should help the client leave the session feeling a sense of self-efficacy about their accomplishments during treatment and a sense of hopefulness and determination to continue with their progress.

Timeline for Session 8:

5 min	Introduction: Agenda
5 min	Review and Discussion of Running Homework
10 min	Introduction to Relapse Prevention & Concerns re Ending Treatment
10 min	Identification of High Risk Situations and Triggers for Relapse
10 min	Development of Relapse Prevention Plan
5 min	Questions from Client and Discussion of Treatment Gains
5 min	Planning for the Following Month

Overview:

This session marks the end of the telephone treatment sessions! Of course, for the next four weeks participants will continue to engage in the exercise program independently, with bi-weekly check-ins from research staff, but that will be very brief.

This session will focus, primarily, on relapse prevention. This is the last time the client will have intensive contact with the therapist, and the goal is for the client to leave this session feeling confident that they have the skills to continue to extend treatment gains in their life. While it is very important for the therapist to instill hope in their client and encourage them in their pursuit, it is also essential for the therapist to be honest with the client about the challenges they will face and to prepare them well to handle these challenges. The therapist will emphasize to the client that implementing change takes time and is difficult, particularly because as humans we tend to resist change. It is important for the client to understand that slipping back into old habits and ways of thinking and behaving is normal and expected; the goal is not to let these lapses become relapses. The client should also understand that it is inevitable that anxiety will reappear in their life again and that the goal is to prepare the client to deal proactively and effectively with those occasions.

To prepare the client, the therapist will introduce them to Alan Marlatt's relapse prevention model. Subsequently, the therapist will help the client identify their own high-risk situations and triggers; in other words, situations, events, people, places, thoughts, feelings, etc. that might lead the individual to relapse into old behaviours. The client and therapist will imagine a lapse situation, so the client can be prepared for what might happen in these situations. Next, the therapist will review the toolbox of coping skills and stress management strategies at the disposal of the client (i.e., those that have been covered previously in therapy). They will help the client develop a relapse prevention plan using this repertoire of skills. More specifically, they will help clients record the steps they will take when anxiety sensitivity reappears in their life or when a high-risk trigger is encountered.

The client should leave the session feeling prepared to use their cognitive and behavioural coping skills to deal with stressful and anxiety-provoking situations. Throughout this session it is important for the therapist to offer the client praise and help them recognize the accomplishments they have made throughout treatment. The therapist will help answer any of the client's final questions or concerns before embarking on several weeks of the exercise program on their own.

Session Tasks

1) Introduction

- Outline session agenda
    - o Therapists should remind client that you will progress through the session content for the day and the client will have an opportunity at the end of session to raise any new concerns/discuss recent events, but of course they are welcome to raise questions throughout the session.
    - o Highlight theme of session. The therapist can explain that this session will focus on relapse prevention and extending treatment gains.
    - o During this session, the therapist will also spend some time reviewing the client's engagement in the physical exercise interoceptive exposure component of treatment.
    - o Remind client that this will be the last 50-minute therapy session. Some time will be spent during the session discussing what this means for the client.
- **Three key things should be accomplished during this session.** These three points can be integrated into each of components of the final session. The hope is that the client leaves on a positive note, having acknowledged accomplishments they've made, discussed their concerns about ending treatment, and developed a plan to handle future setbacks.
    - o The therapist should provide an overview of treatment content including reminding clients of the skills they have at their disposal now
    - o The therapist and client should discuss and address the client's thoughts and feelings about ending treatment
    - o The therapist and client should discuss and celebrate gains the client has made during treatment

2) Review and Discussion of Running Homework

In order to ensure compliance, it is necessary to once again review the client's experience with the running homework. The review in this session will be fairly brief; however, the therapist should briefly discuss the following with the client.

The therapist must first ensure the client completed the running/walking assignment. They also need to collect practical details of the client's experience. The following questions are appropriate in this situation. The client may rely on their exercise log sheets to remind them of their experience.

- Did the client complete the running/walking assignment over the past week?
- How many times did the client run/walk? How long each time?
- What was their average heart rate each time they ran/walked? Was this in their target heart rate range?
- Were there any changes from the previous week?

If the client did not complete the homework as assigned, the therapist must troubleshoot with the client in order to overcome any barriers to homework completion as they did in the previous session. The therapist might investigate the following factors:

- Lack of motivation
- Fear of physical sensations
- Difficulty making time for homework
- Non-conducive environment
- Bad weather

Investigating these different options (and certainly there may be others to consider), will allow the therapist to help the client develop a program that works for them. For instance, the therapist might help the client problem-solve what time of the day they might fit in the run/walk or where in their neighbourhood they might run/walk. Alternatively, the therapist might make a definite plan with the client as far as what days and times the client is going to run/walk in the next week. **The ultimate goal is to figure out what it will take to get the client to engage in the homework the next week.**

Finally, the therapist should very briefly review and discuss with the client the thoughts and feelings they experienced while running. Particular focus should be given to any realizations the client may have come to about the physical sensations and any positive or negative consequences they are experiencing, any changes in experience from the previous week, and any continuing concerns the client might have.

3) Introduction to Relapse Prevention & Concerns re Ending Treatment

After reviewing homework, the therapist will explain to the client that, because this is the last session, what the client and therapist will be discussing will be largely aimed at how to best prepare the client to extend their treatment gains and prevent relapse to old ways of thinking and behaving after the treatment is complete. Also during this subsection, the therapist must spend time discussing the client's thoughts/worries about ending treatment.

The first thing the therapist will do is discuss with the client the challenges they face ahead in terms of making healthy lifestyle choices, adhering to the new ways of thinking and behaving that have been implemented during the treatment program, and continuing with the exercise program. Any change is difficult and clients need to be aware of that so they are not surprised, disappointed, or frustrated when they experience lapses. The therapist could say (p. 149): (please note, the therapist should make this more of an interactive conversation with the client)

"Over the course of treatment we've talked a lot about ways to change our thinking and ways to change our behaviour to help reduce our anxiety sensitivity. And we've talked about implementing new healthy lifestyle habits and introduced a physical exercise program. You've done some amazing work and made a lot of very significant improvements – which is excellent! Now that we're getting ready to end treatment, we want to make sure that the gains you've made during treatment continue in your daily life. Today we're going to work on that.

*To do that though, it's important to get an idea of what kind of challenges you'll face when treatment ends. We as humans are generally resistant to change. We find it really easy to slip back into old habits and old routines. I want to make sure you know that slipping back into old habits is very **normal**! Many, many people who go through treatment programs experience this so don't be surprised or frustrated if it happens. The important things to do are be prepared for those lapses and have a plan in place to deal with them so they don't become relapses. Today we're going to look at how to reduce the chances of slipping back into old habits and then develop a plan to deal with it, should it happen."*

It is very important for the therapist to ask the client about their concerns about ending treatment – does the client have any worries about relapse? What will be the hardest part for them about ending treatment?

Then, it is important for the therapist to explain to the client why lapses and relapses happen. The therapist must first be sure to distinguish for the client the difference between a lapse and a relapse. Then, they should explain why relapses happen and provide encouragement to the client not to get discouraged, but quickly get back on track, should a lapse occur. Alan Marlatt's CBT model for relapse prevention (p.154-155) will be useful here. An example of how this conversation between the therapist and client might go is below:

Therapist: Before we go any farther, the first thing that I want to do is make sure that we're clear on a few terms that I'm using. You've heard me use the term lapse and the term relapse to talk about falling back into old patterns. These are very different things and it's important to know the difference. Have you heard this before?

Client: No. To me lapse and relapse sound like the same thing.

Therapist: Well they are close, but not the same. A lapse is one occurrence or one event of slipping back into old ways of thinking or acting. The easiest way to understand this is to think about it in terms of a person who has an alcohol addiction. So if someone has been sober for a couple of months – so they haven't had anything to drink - and then one day they meet an old girl/boyfriend and they get really upset and they go have a drink. That would be a lapse. Does that make sense?

Client: Yes, I think so.

Therapist: Ok, then a relapse is actually a series of recurrent lapses that are accompanied by a feeling of loss of control. So say the same person we were just talking about gets into an argument the next day with a friend and so goes to have a drink. And the next day is a bad day so they go to have a drink. This might happen a number of times and soon this person starts to feel like they can't control the drinking anymore. That would be a relapse. A lapse is an isolated incident while a relapse is an accumulation of lapses. Make sense?

Client: Yes, that's a lot clearer. You're saying that if it just happens once it's not as bad as it happening again and again and again.

Therapist: Exactly. So, you're probably wondering why these lapses happen and how you can stop them from happening. Is that right?

Client: Yes! I mean, I've worked so hard to this point and I'm a little worried now that I'm not prepared to deal with things going wrong.

Therapist: Well it is completely normal to be feeling worried, as you are. Remember that these lapses are normal and a lot of people go through them. Usually what happens in a lapse is that someone finds him or herself in a high-risk situation – which is a time when a person encounters some kind of situation, or person, or emotion, or event that is likely to lead to a lapse, and then doesn't have the coping strategies or confidence to deal with the situation so they resume old habits.

Client: Ok….

Therapist: I think it's easiest to understand if we use an example. One thing that a lot of people who do this program are worried about is that they will stop exercising after the treatment ends and they will relapse back into less healthy habits. So let's use one of these people as an example, we'll call her Jessica. So let's say for Jessica, a high-risk situation is getting overtired at work. She knows from past experience that when she gets overtired at work she tends to neglect her health and her body. So let's say that one week this happens to Jessica: she gets overtired at work and she feels like she doesn't have the energy to run/walk at home that week, so she doesn't. That would be a lapse. And that would be perfectly normal. You with me so far?

Client: Yes, I think so.

Therapist: Ok, so Jessica's had a lapse. Now let's say that Jessica has forgotten some of the coping and stress management skills we've talked about. She might feel like she's failed by not running/walking for a week, or she might be frustrated and feel like all is lost. So then she doesn't run the week after that because she's feeling sorry for herself and then the week after that she doesn't run because she doesn't see the point anymore. And Jessica stops running. This would be a relapse. There are couple important points there. The first is, did you see the difference between a lapse and a relapse?

Client: Yes, definitely.

Therapist: Great. Lapses aren't unusual. And the second point is that after the high-risk situation and the first lapse occurred, there were opportunities for Jessica to prevent the relapse from occurring if she'd used her coping skills and strategies. To prevent a lapse from becoming a relapse, you need to treat the lapse as a learning experience. So for example, you've been doing really well in treatment so far and you have pretty much overcome a number of your fears and you're feeling less worried about some of those physical sensations, am I right?

Client: Yes for sure, I have overcome a lot of my fear!

Therapist: Excellent! But even though this has happened you might find that after treatment ends there are some times when you find yourself feeling anxious again. This is very common; we call it the **'return of fear'**. The important thing to know is that it doesn't mean that all is lost and that you're back to square one. It is simply a message to yourself that you need to continue practicing your exposure exercises and cognitive restructuring.

Client: Ok, so it sounds like all is not lost with one slip-up…

Therapist: Absolutely not! And today what we're going to do is work to prepare you the best we can to deal with high-risk situations that appear in your own life. We'll work to identify those situations so you'll be able to try to avoid them proactively but also be ready for them when they do arise. And then we'll set up a plan of how you're going to cope effectively with those situations.

It should be noted that, depending on the client's experience with:
- Panic attacks (p.150-151),
- Benzodiazepine dependence (p.151),
- Smoking (p.152), or
- Other substance use (p.152-153)

The therapist should consider highlighting some of the key points about anxiety sensitivity and relapse prevention for each of these challenges.

It is important for the therapist to discuss the relevance of anxiety sensitivity to relapse prevention in exercise programs with **<u>ALL</u>** clients. Key points to mention include:

- Lapses and relapses are common in exercise programs for everyone.

- Because people with high anxiety sensitivity tend to avoid exercise, it seems likely that they would be apt to abandon exercise programs. Therefore, relapse prevention is important when promoting exercise programs for those with high anxiety sensitivity.

- Positive coping responses are associated with reduced likelihood of abandoning exercise programs. Positive coping responses include use of positive reappraisal (e.g., "I reminded myself that I've had some of my best runs when I didn't feel like it") and task or problem-solving (e.g., "I decided to drive toward the gym, and I told myself I didn't have to exercise that long).

- Exercise can decrease the probability of relapse for those working to reduce anxiety sensitivity. In other words, continued exercise makes it less likely anxiety sensitivity will rear its head again.

4) Identification of High Risk Situations and Triggers for Relapse

After discussing the importance of relapse prevention with the client, the therapist should help them identify situations and triggers that might be most likely to cause them to relapse; in other words, most likely to cause a **'return of fear'**. This way the client can prepare for when those situations and triggers might arise and have coping strategies in place to deal with these situations and triggers.

The therapist should do this using the activity on p.156 of the treatment manual. The client should think about places, people, emotions, and thoughts that might elevate their risk of relapse, either into old ways of thinking or into exercise avoidance.

Following this activity, the therapist and client should go through the list of triggers for relapse on pages 157 to 158 and think about other people, places, emotions, or thoughts that they may have missed that would may serve as triggers to relapse for the client. These include:

- Adversity
- Negative emotional states
- Negative physical states
- Negative thinking styles (could include cognitive distortions p.158-160)
- Social pressure
- Lack of self-efficacy/self-confidence

Any further triggers identified in this discussion should be added to the list that the client is generating. It is important for the client to have a record of their high risk triggers.

5) Development of Relapse Prevention Plan

Identifying triggers and high-risk situations is one of the key steps in developing a relapse prevention plan. The client and therapist should discuss what the client thinks will happen if they encounter one of these triggers. From there they should go on to review what to do to prevent a relapse of anxiety sensitivity and the therapist should help the client develop a plan to deal with high-risk situations, should they occur. **The therapist needs to remind the client of all of the 'tools' that they have at their disposal in terms of coping strategies to help them deal with anxiety sensitivity in the future.** This can also serve as somewhat of a treatment summary/review.

To do this step, therapists could follow the 'What to Do to Prevent Relapse of Anxiety' steps on p.160-161 of the treatment manual as a guideline. The stages and what the therapist should do at each stage are outlined here. If time is limited, the therapist might choose the steps they think are most relevant for the client's stage. The therapist should encourage the client to record their relapse prevention plan for future review!

Become an expert on anxiety. The therapist should review with the client what the physical signs are that they are getting anxious.

Identify high-risk situations. The therapist should tell the client that they just did that step, and that the client should keep that list of high-risk situations handy as a reminder.

Identify early-warning signs. Similar to identifying the physical signs of anxiety, the therapist should encourage the client to identify emotional, cognitive, and behavioural signs that anxiety may be resurfacing. The therapist should help the client develop a list of coping strategies they could use at this stage (e.g., review sleep hygiene, practice diaphragmatic breathing, relaxation, thought challenges).

Anticipate and prepare for lapse or relapse. With the therapist, the client should imagine what a lapse would be like. Then, and very importantly, the therapist should help the client identify what they can do in those situations to help them make sure a lapse doesn't become a relapse. This step would call for an identification of skills learned during treatment. ****Importantly, the therapist should spend some time discussing the Decisional Balance scale on p. 141 with the client.**

Cope with feeling overwhelmed. The therapist should talk with the client about dealing with the inevitable occasion when they feel overwhelmed. They should emphasize being in the moment and using breathing or other mindfulness/yoga/meditation strategies if the client is interested.

Expand coping skills. The client should be encouraged to continue to look for new coping skills and to practice the ones they have. If not yet done, the therapist could review a list of coping skills and strategies that have been covered in treatment.

Enhance self-efficacy/confidence. Though not discussed in treatment, this was mentioned in the treatment manual (p.144-146). This is a time when the therapist should offer the client praise for their accomplishments and help them realize all of the successes they have made. The therapist can teach the client to continue to recognize these successes in the coming weeks.

Enlist the help of others, or mentor others. The therapist could help the client identify someone in their social support network who can help them stay on track.

Keep the commitment. The therapist should encourage the client to review this plan.

Do all things in moderation. The therapist can emphasize the importance of balance.

When this is completed it is very important for the therapist to offer praise to the client. Give them credit for their successes and help them recognize their accomplishments. The therapist should work to instill hope in the client (p.164) – because they have a plan to stay on track this will keep them moving forward purposefully.

6) Questions from Client and Discussion of Treatment Gains

At the end of every session, as well as throughout the session, the client should be given the opportunity to ask any questions that they might have about the material for the week.

**Also, during this time, the therapist should spend time with the client discussing any gains that they made during the treatment program. Some time should be spent acknowledging and congratulating any important achievements and any changes in how the client feels about him or herself and about anxiety sensitivity. *If the client is interested in more quantitative feedback on their current level of anxiety sensitivity they can be encouraged to use the ASI that appears in the treatment manual on pages 33-34. (The manual also provides details on how to score the ASI and on what a 'high' score might entail.)*

7) Planning for the Following Month & Wrap-Up

At the end of the session, the therapist has to conclude treatment. A thorough review of the material has been done during this session, so this is the time for clients to raise any issues or concerns or continuing worries that they may have. The therapist should offer praise and encouragement.

At the end of the session, the therapist should be sure the client understands the expectations for the next few months.

- The client is expected to continue with the exercise program for the next four weeks.

- The client should continue to fill out exercise logs and mail them in weekly.

- Research staff will call the client in two weeks and again in four weeks very briefly, just to make sure everything is on track.

- The client will be receiving (may already have received) post-treatment measures in the mail. The therapist should ask the client to complete and return these as soon as possible.

Chapter 9
Continuing Contact

Two and four weeks after the final treatment session, a research assistant will re-contact the client to:
      a)   ensure compliance with the exercise program, and
      b)   address any questions or concerns the client may have

Administrative Additions
Four weeks after the final treatment session, the research assistant will:
    a) Remind the client they will be receiving (may already have received), the 12 week post-exercise questionnaire. Research assistants should ask clients to complete this questionnaire and return it as soon as possible to the study investigators.
    b) Schedule the participant's final SCID assessment.

Exercise Program
In line with the review of exercise homework in previous sessions, during the 10 week check-in phone call the research assistant should ensure the client is engaging in the exercise program as prescribed. The following questions are appropriate in this situation.

- Did the client complete the running/walking assignment over the past few weeks?

- How many times did the client run/walk? How long each time?

- Were there any changes across the previous weeks?

If the client did not complete the homework as assigned, the research assistant may try troubleshooting with the client in order to overcome any barriers to exercise by investigating.

Research assistants are not expected to go into this discussion in detail as a therapist would have during therapy. **The ultimate goal is to try to figure out what it will take to get the client to engage in the homework the next few weeks and encourage them on their way.**

Questions and Concerns
After the check-in around exercise completion, the research assistant should ask the client if they have any questions or concerns they'd like to address.
      "It's been a couple of weeks since you ended telephone sessions and you continued with the running program independently. Has there been anything that's come up over the last couple weeks that you'd like to talk about? Or do you have any questions or concerns?"

If the client raises no questions or concerns, the research assistant can terminate the call with the reminder that they will be calling again in two weeks, marking the end of the treatment program.

APPENDIX C

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Jun 17, 2013

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Registered Company Number	1982084
Customer name	Janine Olthuis
Customer address	1764 Cambridge Street Halifax, NS B3H4A9
License number	3171371130405
License date	Jun 17, 2013
Licensed content publisher	Elsevier
Licensed content publication	Journal of Anxiety Disorders
Licensed content title	Anxiety Sensitivity Index (ASI-3) Subscales Predict Unique Variance in Anxiety and Depressive Symptoms
Licensed content author	Janine V. Olthuis,Margo C. Watt,Sherry H. Stewart
Licensed content date	21 May 2013
Licensed content volume number	
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Expected completion date	Jul 2013
Estimated size (number of pages)	379
Elsevier VAT number	GB 494 6272 12
Permissions price	0.00 USD
VAT/Local Sales Tax	0.00 USD / GBP
Total	0.00 USD