

The Efficacy of an Internet-Based Cognitive-Behavioral Therapy Intervention for Child Anxiety Disorders

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Objective To evaluate the efficacy of an Internet-based cognitive-behavioral therapy (CBT) approach to the treatment of child anxiety disorders. **Methods** Seventy-three children with anxiety disorders, aged 7–12 years, and their parents were randomly assigned to either an Internet-based CBT (NET) or wait-list (WL) condition. Clinical diagnostic assessment and parent and child questionnaires were completed before and after treatment. The NET condition was reassessed at 6-month follow-up. **Results** At posttreatment assessment, children in the NET condition showed small but significantly greater reductions in anxiety symptoms and increases in functioning than WL participants. These improvements were enhanced during the 6-month follow-up period, with 75% of NET children free of their primary diagnosis. **Conclusions** Internet delivery of CBT for child anxiety offers promise as a way of increasing access to treatment for this population. Future research is needed to examine ways to increase treatment compliance and further enhance the impact of treatment.

Key words child anxiety; cognitive-behavior therapy; computer; Internet; online therapy.

Between 5% to 10% of children and adolescents experience clinically significant anxiety disorders (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Essau, Conradt, & Petermann, 2000, 2002), and, if left untreated, such problems may result in a number of adverse academic, vocational, and social consequences (Costello, Angold, & Keeler, 1999; Ginsburg, La Greca, & Silverman, 1998; Last, Hansen, & Franco, 1997). Cognitive-behavioral therapy (CBT) has been shown to be highly effective in treating child anxiety disorders (see James, Soler, & Weatherall, 2005, for a review). Indeed, between 50% and 85% of youth receiving CBT no longer meet criteria for their primary anxiety diagnosis at the end of treatment (Barrett, Dadds, & Rapee, 1996; Kendall, 1994; Kendall et al., 1997), with effects maintained up to several years later (Barrett, Duffy, Dadds, & Rapee, 2001; Kendall & Southam-Gerow, 1996).

Despite the efficacy of CBT interventions, the vast majority of children with anxiety do not receive treatment (Essau et al., 2000). This may reflect the family's failure to realize that there is a problem, a lack of knowledge about the availability of treatment, lack of local mental health services, and constraints on the family in terms of time

or finances (Booth et al., 2004). Clearly, there is a need to provide CBT for child anxiety that is easy for families to access.

In recent years, computer-based technologies have been used to increase access to health and mental health services. Such methods include palm-top computers, e-mail, the World Wide Web (Internet), DVDs, CD-ROMs, virtual reality, and interactive voice messaging systems (Griffiths & Christensen, 2006; Newman, 2004). CBT has lent itself particularly well to computerization given its highly structured procedures and format (Anderson, Jacobs, & Rothbaum, 2004; Proudfoot, 2004).

To date, the majority of research investigating the impact of computer and online CBT for anxiety disorders has involved adult populations, and the results have been largely positive in the treatment of a range of anxiety disorders (see Griffiths & Christensen, 2006, for a review). Generally, the results suggest that computer-based CBT for adult anxiety produces small but significant reductions in anxiety when treatment is completed on a self-help basis, with effects being more substantial if accompanied by regular therapist contact, by phone, e-mail, or face-to-face (Spek et al., 2007).

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It remains to be determined whether such methods can be effectively used in the treatment of childhood anxiety. The lack of development and evaluation of computer-based interventions for childhood disorders is particularly surprising given that children are generally highly skilled in the use of computer technologies (Calam, Cox, Glasgow, Jimmieson, & Larsen, 2000), and that the Internet has become a commonly used source for seeking help, particularly for adolescents (Nicholas, Oliver, Lee, & O'Brien, 2004).

The limited research relating to computer-based interventions for childhood anxiety has demonstrated positive outcomes in case studies of spider phobia (Nelissen, Muris, & Merckelbach, 1995) and selective mutism (Fung, Manassis, Kenny, & Fiksenbaum, 2002), as well as a small randomized controlled trial of the treatment of spider phobia in children (Dewis et al., 2001). In addition, a recent randomized controlled trial conducted by Spence, Holmes, March, & Lipp (2006), demonstrated positive outcomes for a CBT intervention, in which half the sessions were presented over the Internet and half in the clinic. Compared to no-intervention program, the partially Internet-based program produced significant reductions in anxiety symptoms. Further, there were only minimal differences between the combined Internet- and clinic-based treatment and the entirely clinic-based intervention. This study demonstrated the feasibility of transforming at least some parent and child CBT sessions into Internet format, with only minimal reductions in therapeutic outcome.

To date, there does not appear to have been a larger scale randomized controlled trial to evaluate the impact of CBT for child anxiety when delivered entirely over the Internet. The present study reports the findings of such a trial in which a CBT program involving both parent and child sessions was administered entirely via the Internet, supplemented by minimal therapist assistance via telephone and e-mail. Efficacy was evaluated by comparing the Internet therapy with a wait-list (WL) control condition, from pretreatment to posttreatment, with the outcomes of therapy being reassessed at 6-month follow-up. Fortunately, there are now a number of studies that demonstrate large effect sizes for clinic-based CBT for child anxiety (Ishikawa, Okajima, Matsuoka, & Sakano, 2007), which will allow us to make comparisons with the online intervention in this study.

Method

Participants

Participants were 73 children (33 boys, 40 girls), aged 7–12 years ($M = 9.45$, $SD = 1.37$), and their parents.

Ninety-four percent of children were born in Australia, with the remainder born in New Zealand, Europe, the United States, or Canada. None of the children identified as being of Aboriginal or Torres Strait Islander origin. The majority of children (87.7%) were living in families with both biological parents, and on average, children came from middle- to high-income Australian families as assessed through combined family income and parent education levels. Table I presents the sociodemographic and diagnostic information for participants.

Following assessment, families were randomly allocated to one of two conditions: an Internet-based intervention (NET; $n = 40$) or a WL control ($n = 33$). Order of random allocation was determined via a computer program in advance of the study and was unknown to the interviewers until the participant was included in the study. Participants were informed of their condition by the primary researcher.

Inclusion criteria comprised a primary diagnosis of an anxiety disorder (other than obsessive-compulsive disorder (OCD), panic disorder, or posttraumatic stress disorder), age between 7 and 12 years, a minimum reading level of 8 years, access to the Internet at home, and “clinical” or “at-risk” levels of anxiety as measured by anxiety questionnaires (see below). Although it has been proposed that children with panic disorder and OCD may benefit from general anxiety programs, such children were not included in the present study as the current intervention did not contain disorder-specific elements (e.g., breathing retraining and exposure and response prevention), which are typically part of the treatment of such disorders.

Children and parents were both interviewed by a trained psychologist using the Child and Parent Interview of the Anxiety Disorders Interview Schedule for Children (ADIS-C & ADIS-P; Silverman & Albano, 1996). Child and parent interview data were combined to provide a composite diagnosis according to the guidelines offered by Silverman and Albano (1996). A minimum diagnostic severity level of 4 (i.e., at least moderate severity) on an 8-point scale was required for inclusion. The mean clinical severity rating of the sample prior to treatment was 5.88 ($SD = .74$). This level of anxiety is indicative of a “markedly disturbing/disabling” anxiety disorder.

Figure 1 presents the CONSORT statement for participants at each stage of the study. As can be seen in Fig. 1, 120 of the 193 children assessed for eligibility for the study were excluded following a telephone screening interview with the parent. These children were excluded due to a variety of reasons, including nonclinical levels of anxiety (45%), presence of a developmental disorder or learning

Table 1. Sociodemographic and Diagnostic Information for the Two Conditions at Baseline

Demographic	NET (<i>n</i> = 40)	WL (<i>n</i> = 33)	Chi-square (χ^2)	Significance <i>P</i>
Gender (%)				
Female/male	52.5/47.5	57.6/42.4	0.188	0.67
Age				
Child	9.75 (1.24)	9.09 (1.44)		
Mother	41.75 (5.34)	40.55 (4.66)		
Father	44.78 (6.27)	41.79 (8.09)		
Combined family income (%)				
<40,000	21.1	12.5	7.04	0.22
41,000–60,000	26.2	34.4		
61,000–80,000	15.8	15.5		
81,000–100,000	15.8	6.3		
>100,000	21.1	31.3		
Highest education level (%)				
Mother			2.39	0.66
Postgraduate	22.5	33.3		
University degree				
Undergraduate	30	18.2		
University degree				
Technical or	22.5	21.2		
apprenticeship				
Completed year 12	12.5	18.2		
Completed year 10	12.5	9		
Father			7.35	0.12
Postgraduate	20.6	36.4		
University degree				
Undergraduate	12.8	24.2		
University degree				
Technical or	28.2	24.2		
apprenticeship				
Completed year 12	25.6	6.1		
Completed year 10	12.8	9.1		
Child's country of birth				
Australia (%)	95.0	94.0	2.14	0.54
Pacific/New	2.5	3		
Zealand (%)				
United States	0	3		
of America (%)				
Europe (%)	2.5	0		
Primary anxiety diagnosis (%)				
Separation	32.5	30.3	1.74	0.63
anxiety disorder				
Social phobia	37.5	39.4		
Generalized	20	27.3		
anxiety disorder				
Specific phobia	10	3		

Note. SD in parentheses.

disability (13.5%), presence of primary depressive disorder (7.5%), involvement in other psychiatric treatment (5.5%), age below 7 years (4%), presence of primary behavioral disorders (3.5%), lack of access to a computer (2.5%), or failure to complete screening assessment (17%). Only 2 (1.5%) potential participants were excluded because of a primary diagnosis of OCD, and no participants approached the program with a primary diagnosis of panic disorder or posttraumatic stress disorder.

For the 73 participants who were included in the study, primary anxiety diagnoses included separation anxiety disorder (*n* = 23), generalized anxiety disorder (*n* = 17), social phobia (*n* = 28), and specific phobia (*n* = 5). In terms of comorbidity, 89% of children met criteria for a secondary anxiety disorder, 4.1% for depression/dysthymia, 4.1% for attention deficit hyperactivity disorder, 4.1% for oppositional defiant disorder, and 2.7% for enuresis. On average, children displayed 2.99 anxiety diagnoses. None of the participants were receiving concurrent pharmacological treatment. Families excluded from the study were provided with appropriate referral information.

Six families from the NET condition and four from the WL condition withdrew from the study prior to the commencement of treatment. During the treatment phase, there were an additional four dropouts from the NET condition, with one further NET family dropping out at 6-month follow-up. There were no dropouts in the WL condition during treatment or follow-up. There were no significant differences between those who withdrew from the study (*n* = 15) and those who remained in the study (*n* = 58) in terms of demographic or outcome measures.

Procedure

Children were referred to the program by parents, teachers, guidance officers, and other mental health professionals in response to media releases and information packages sent to schools throughout Australia. After referral, parents and children visited an online information page explaining the procedure of the study, followed by provision of online informed consent. An initial screening interview to assess broad inclusion and exclusion criteria was conducted with the child's parent over the telephone. If, from this parental screener, the child was deemed likely to be suitable for the project, parents and children were then asked to complete a package of questionnaires online. Parents were instructed to assist their children to log on to the questionnaire Web site but were asked not to influence the responses made by the child. Responses to the questionnaire items were automatically e-mailed to the researchers. Children and parents

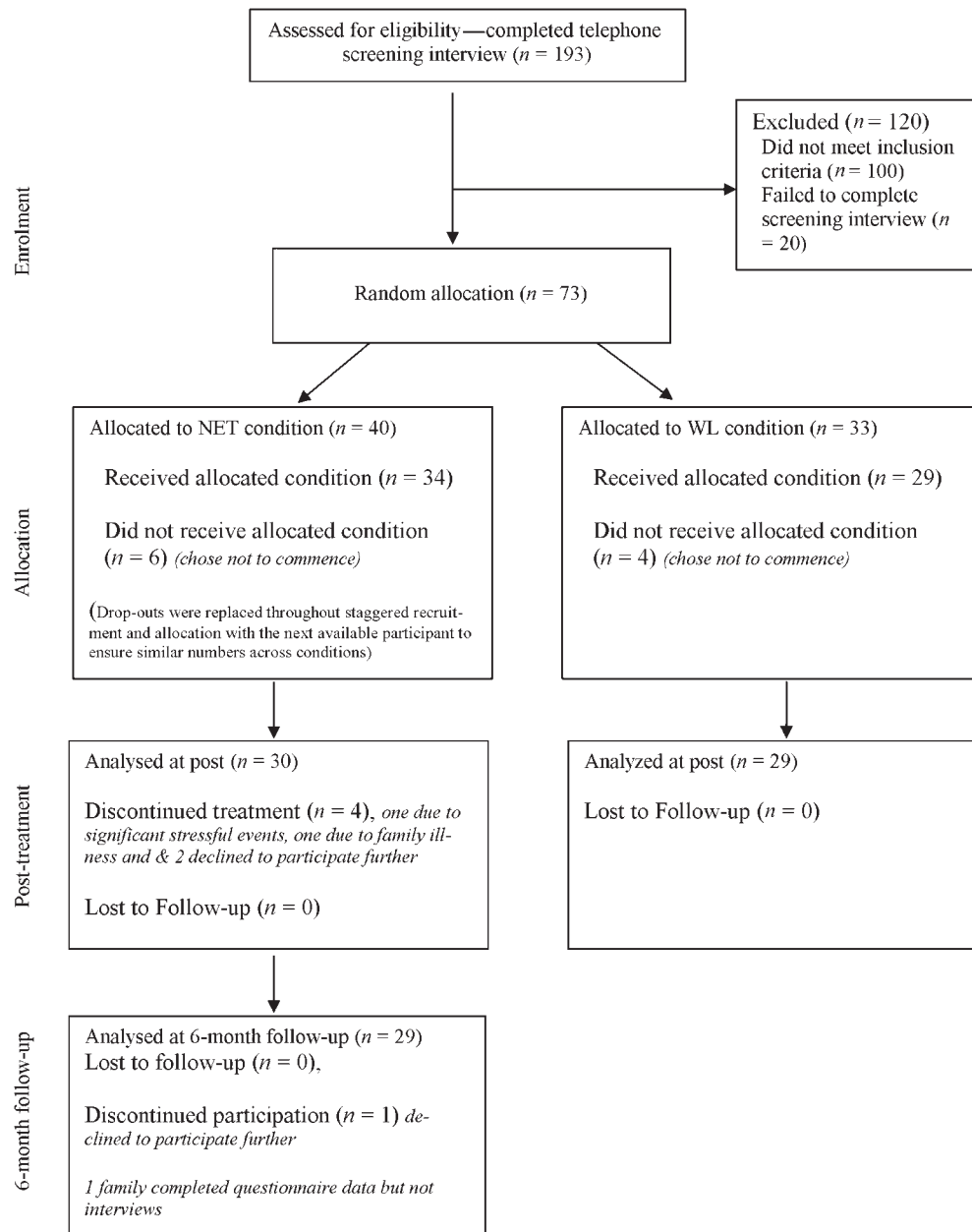


Figure 1. Flow diagram of participants' progress through phases of study.

proceeded to the clinical interview stage of the project if they fell within the clinical or at-risk range on the Child Behavior Checklist Internalizing scale (CBCL-Int: Achenbach, 1991) or the Spence Children's Anxiety Scale, Child or Parent version (SCAS-C/P: Spence, 1998, 1999).

The diagnostic interview was completed over the telephone with all children and parents (see below) by trained interviewers who were blind to experimental condition. Families who met inclusion criteria were randomly allocated to either NET or WL conditions. Interviews and questionnaire packages were completed at three time points (pretreatment, posttreatment, and 6-month

follow-up) for the NET condition and at times equivalent to pre- and posttreatment (10 weeks later) for the WL group. After posttreatment, the WL group ceased to form part of the study and commenced treatment themselves. This study was conducted in compliance with the University of Queensland Human Ethics Committee.

Measures

Structured Diagnostic Interview

Diagnostic status was assessed using the ADIS-C and ADIS-P (Silverman & Albano, 1996), with the same parent interviewed at each time period. Given that families

were recruited Australia-wide and the intervention was delivered entirely via the Internet, the interview was administered via the telephone. Lyneham and Rapee (2005) demonstrated the validity of using a telephone version of the ADIS interview compared to standard face-to-face administration, with high levels of interassessor agreement for diagnoses for both versions.

Clinician-Rated Assessment of Functioning

The clinician also provided an assessment of global level of functioning using the Children's Global Assessment Scale (CGAS; Schaffer et al., 1983). Scores on the CGAS were based on information gathered during the ADIS-C/P interviews, with children assigned a rating from 0 to 100, where higher scores were indicative of higher functioning. Scores between 81 and 100 on the CGAS indicate a normal level of functioning, scores of 61–80 represent a slight disability, scores of 41–60 indicate moderate disability, and scores of 1–40 represent serious disability (Schaffer et al., 1983).

Interassessor reliability in the present study was determined from a random sample of interviews from 15% of families, using two trained interviewers who were blind to original diagnoses. High interassessor reliability was found for ADIS diagnoses, with a kappa value of 1 for the primary diagnosis and a correlation of .98 for the ADIS combined severity ratings. Interrater reliability of .91 was found for CGAS ratings between the independent assessors.

Child- and Parent-Report Questionnaires

Children and parents completed a number of online questionnaires designed to assess symptoms. Child anxiety was measured through child- and parent-report versions of the SCAS (Spence, 1998, 1999). The SCAS scales include 38 items reflecting symptoms of anxiety scored for frequency of occurrence: 0 (*never*) to 3 (*always*). Both the SCAS-P and SCAS-C provide a total anxiety score and six subscale scores that assess children's symptoms relating to separation anxiety, social phobia, OCD, panic-agoraphobia, generalized anxiety, and fears of physical injury. The subscales were developed to reflect symptom clusters represented by the Diagnostic and statistical manual of mental disorders, fourth edition (*DSM-IV*), with confirmatory factor analyses supporting the proposed factor structure in several studies (Spence, 1998, 1999). The SCAS-C and SCAS-P have demonstrated sound psychometric properties, with internal consistency reported at .89 for the total parent anxiety score and .92 for the total child score (Muris, Schmidt, & Merckelbach, 2000; Nauta et al., 2004; Spence, 1998; Spence, Barrett, & Turner, 2003).

Child internalizing behavior was assessed through the CBCL-Revised (Achenbach & Rescorla, 2001). The CBCL

yields a total behavior problem score, as well as two global dimensions of disturbance, internalizing and externalizing subscale scores. The internalizing subscale can be broken down further into anxious, depressed, and withdrawn subscales, while the externalizing scale can be divided further into aggression and impulsivity subscales. Only the scores on the internalizing subscale are presented in this paper. The psychometric properties of the CBCL are well established (Achenbach & Rescorla, 2001).

Given the high comorbidity between anxiety and depression, children's depression symptoms were measured by the Centre for Epidemiological Studies for Depression Scale (CES-D; Radloff, 1977). Scores on this instrument may range from 0 to 60, with higher scores indicating higher levels of depressive symptoms. The CES-D has demonstrated good psychometric properties (Radloff, 1991).

Expectancy and credibility ratings were also assessed prior to treatment by an author-developed questionnaire based on the work of Borkovec and Nau (1972). The measure included five questions on which participants rated their expectancies regarding various aspects of the intervention (e.g., How much do you expect that this program will help you beat your fears and worries?) on a 10-point scale (0 = *not at all*, 9 = *completely*). Higher scores represented higher treatment outcome expectancy.

Satisfaction with the program was measured through an author-developed 8-item rating scale that was completed by parents and children immediately following the 10-week intervention period. Participants rated their satisfaction with the program on a 5-point scale (1 = *not at all true*, 5 = *extremely true*), and scores were averaged to provide a mean satisfaction score. Higher scores were indicative of greater satisfaction with treatment. In addition, three open-ended questions provided information on aspects of the program that participants liked most, what they liked least, and what they perceived to be the most important components of therapy.

Content of the Intervention

The intervention (BRAVE for Children–ONLINE) was adapted from a clinic-based, CBT anxiety treatment program (the BRAVE Program) for children aged 7–14 years (Spence et al., 2006). The clinic-based version of the program has demonstrated significant reductions in anxiety symptoms and disorders, consistent with those evident elsewhere in the literature (Spence et al., 2006). The intervention was based on theoretical and empirical research relating to the psychosocial determinants of child anxiety (e.g., Dadds & Roth, 2001; Rapee & Spence, 2004;

Silverman & Treffers, 2001) and evidence-based, cognitive-behavioral interventions (Barrett, 1998; Kendall, 1994; Rapee, Wignall, Hudson, & Schniering, 2000; Spence, Donovan, & Brechman-Toussaint, 2000).

The online intervention mirrors the clinic-based program, comprising 10 weekly, 60-min child sessions and 6 weekly, 60-min parent sessions. Two booster sessions conducted 1 and 3 months following the end of treatment focus on consolidation and prompting of previously learned skills, as well as relapse prevention strategies. Anxiety management strategies within the online program include recognition of the physiological symptoms of anxiety, relaxation strategies (progressive muscle relaxation, guided imagery, and deep breathing), cognitive strategies of coping self-talk and cognitive restructuring, graded exposure, problem-solving techniques, and self-reinforcement of "brave" behavior. Parent sessions focus on strategies such as psychoeducation about child anxiety, contingency management, relaxation training, and information about cognitive restructuring, graded exposure, and problem solving. In this way, the parents are empowered to help their children acquire and use the skills presented in the program, and to assist more effectively in situations where their children becomes anxious.

The online sessions are presented in an interesting engaging manner and are designed to both stimulate motivation and facilitate learning. Each session comprises 20–30 web pages, and participants are required to work sequentially through each page. Pages have been created to be visually appealing and interesting, with bright, eye-catching graphics including cartoon animation. Sessions comprise reading material, question and answer exercises, games, and quizzes. Children are frequently requested to type responses into the program and cannot progress to the next page if a response is not entered. Specifically, for each strategy learned (e.g., cognitive restructuring), children and parents are provided with an example and are then asked to apply the strategy to their own anxiety-provoking situations (e.g., to activate a personally relevant self-statement).

Quizzes are used to increase the interactive nature of BRAVE-ONLINE and to facilitate attention and comprehension of material. Each session begins with a recap and quiz relating to the previous session and ends with a summary and quiz relating to the current session. The young persons are provided with automated feedback regarding the accuracy of their responses via pop-ups to ensure their understanding of key concepts. Further, at the completion of each session, children and parents are

allocated specific homework tasks to complete before the next session (e.g., practise relaxation every day for 15 min). Completion of homework activities is then reviewed at the beginning of the following session, with children and parents being asked to provide an account of their homework task and to describe any difficulties experienced with the process.

As part of the program, the online therapist is able to access responses to homework and session activities through the administrator section of the program and respond to these reports via e-mail. Although these messages follow a set structure, they are personalized to the participants' individual responses and are aimed at reinforcing effort and success and clarifying misunderstandings of program content. In addition, participants receive automated, computer-generated, standardized, weekly e-mails both before each session (as a reminder to complete their session) and after each session (to congratulate them on finishing their session). Automated reminders are also used to prompt participants who are late in completing a session.

Families are provided with a resource folder that includes the Web site address, username information, program and session outlines, BRAVE staff contact details, a relaxation CD, handouts, and a tutorial guide designed to ensure appropriate software, demonstrate use of the Internet, and ensure the correct setup of browsers. Sessions are made available to participants 7 days after the completion of their previous session, as the program is intended to be completed at a rate of one session per week. In addition to weekly online contact with a therapist, parents and children also receive telephone therapist contact on two occasions. First, prior to treatment, children and parents are introduced to their online therapist via a 15-min telephone call, during which they are provided with a brief description of the program and procedures. Second, a 30-min phone call is completed midway through the program (15 min with the child, and 15 min with the parent) to assist in the development of an exposure hierarchy targeting the child's primary anxiety diagnosis. This call is scheduled following the completion of session 5, in which children and parents are introduced to the concept of exposure and are required to begin constructing their own hierarchy for homework. The midpoint call allows the therapist to review the hierarchy that children and parents have created and to provide feedback and advice where necessary. Children subsequently complete steps of their hierarchy as homework tasks in the following sessions. For a more detailed description of the development of the program, see Spence et al. (2008).

Results

Power

Power calculations, based on repeated measures comparison between two groups for a single measure across two occasions, indicated that a sample size of 32 per group would provide a power of .95 to detect a large effect size at $\alpha = .05$. Given the large effect sizes demonstrated in the anxiety literature between an active treatment and no-intervention control (In-Albon & Schneider, 2006; Ishikawa et al., 2007), a sample size of 73 was, thus, considered sufficient to detect a clinically meaningful difference in outcome between the two conditions.

Pretreatment Comparison

Preliminary analyses were conducted to ensure there were no significant differences between conditions at pretreatment. As is evident in Table I, there were no differences in terms of gender, country of birth, mother's education level, father's education level, or household income. Multivariate analysis of variance also revealed that there were no significant differences between conditions for child's age, mother's age, father's age, or number of siblings, Pillai's $F(4, 68) = 1.62, p = .18, \eta^2 = .09$.

With regard to diagnostic status, no significant differences were evident between groups for type of primary anxiety diagnosis, $\chi^2(3, N = 73) = 1.74, p = .63$; presence of comorbid nonanxiety disorders, $\chi^2(1, N = 73) = .02, p = .96$; and number of anxiety diagnoses, diagnostic severity rating, or global assessment of functioning, Pillai's $F(3, 69) = .97, p = .41, \eta^2 = .04$. Further, no significant differences were noted for child questionnaires, Pillai's $F(2, 70) = .26, p = .77, \eta^2 = .007$; or for parent questionnaires, Pillai's $F(3, 69) = .91, p = .44, \eta^2 = .04$.

Treatment Expectancy and Credibility

Treatment expectancy and credibility ratings for the NET condition were completed at the end of treatment session 1. The mean expectancy ratings were 34.5 ($SD = 6.07$) for children and 36.37 ($SD = 3.74$) for parents. These ratings were slightly higher than those found for previous clinic-based and partial Internet interventions using the same measure (Spence et al., 2006), indicating strong expectancy for positive outcome and credibility of the treatment approach.

Completer Analysis: Pre- to Posttreatment

Anxiety Diagnoses

The percentage of children who no longer met DSM-IV criteria for their primary anxiety disorder at posttreatment

was determined on the basis of combined parent and child reports on the ADIS-P and ADIS-C. At posttreatment, 9 out of 30 (30%) children in the NET condition and 3 out of 29 (10.3%) children in the WL condition no longer met criteria for their primary anxiety disorder. The difference between conditions approached significance, $\chi^2(1, N = 59) = 3.52, p = .06$, suggesting a trend for more participants in the NET condition to lose their primary anxiety diagnosis following treatment. An evaluation of the percentage of children who no longer met criteria for any anxiety disorder at posttreatment also failed to show a significant difference between conditions, $\chi^2(1, N = 59) = 2.82, p = .09$. Only 5 out of 30 (16.7%) children in the NET condition were free of any anxiety diagnosis compared to 1 out of 29 (3.4%) children in the WL condition at postintervention.

Clinician Severity Ratings, CGAS Ratings, and Number of Diagnoses

The means and standard deviations for outcome variables across both conditions are shown in Table II. Repeated measures analyses of variance (ANOVAs) were conducted for each measure, and Bonferroni corrections were applied to control for type 1 error among correlated outcomes. No significant condition effects were found for clinician severity ratings of primary anxiety diagnosis, CGAS ratings, or number of anxiety diagnoses, although the effect for CGAS ratings approached significance, $F(1, 57) = 3.53, p = .065$. There were main effects for Time for the clinician severity ratings, $F(1, 57) = 44.65, p = .000, \eta^2 = .44$; CGAS ratings, $F(1, 57) = 57.88, p = .000, \eta^2 = .50$; and number of anxiety diagnoses, $F(1, 57) = 39.09, p = .000, \eta^2 = .41$. Significant Condition \times Time interactions were evident for clinician severity ratings, $F(1, 57) = 8.58, p = .005, \eta^2 = .13, d = .56$, and CGAS ratings, $F(1, 57) = 17.15, p = .000, \eta^2 = .23, d = -.77$, but not for number of diagnoses, when a corrected alpha level of .01 was applied, $F(1, 57) = 5.35, p = .02, \eta^2 = .09, d = -.45$. As can be seen in Table II, the NET participants showed significantly greater improvement in clinician severity ratings and CGAS ratings than participants in the WL condition. There was also a trend for NET participants to show a greater reduction in number of anxiety diagnoses over time compared to WL participants.

Questionnaire Measures

No significant condition effects were found for any of the parent or child questionnaire measures. However, main effects for Time were evident for the SCAS-C, $F(1, 48) = 49.34, p = .00, \eta^2 = .51$; SCAS-P,

Table 2. Mean Values and SD for all Outcome Measures Across Occasions and Conditions

Value	Pre-treatment		Post-treatment		Six-month follow-up
	NET	WL	NET	WL	NET
Diagnostic severity rating					
M	6.07	5.83	4.3*	5.14	2.32 [#]
SD	0.58	0.6	1.58	1.43	1.78
CGAS rating					
M	50.87	51.72	61.73*	54.93	73.67 [#]
SD	3.95	5.24	8.71	8.91	9.14
Number of anxiety diagnoses					
M	3	3.03	1.8	2.48	0.57 [#]
SD	1.17	1.64	1.37	1.66	0.84
SCAS-C					
M	40	38.56	27.36	29.72	20.77 [#]
SD	15.11	17.31	12.57	14.2	9.81
CES-D					
M	19.68	17.64	17.24	17.88	16.77
SD	10.94	10.33	9.05	7.08	8.06
SCAS-P					
M	38.29	32.93	25.79*	29.42	18.52 [#]
SD	14.07	13.05	12.4	10.71	9.63
CBCL-Int T score					
M	72.29	71.31	60.17*	65.46	55.22 [#]
SD	8.51	6.7	9.84	9.2	13.51

Note. *A significant difference between NET and WL at post-treatment; [#]A significant difference from post-treatment to follow-up for NET participants. Higher scores on the CGAS are indicative of higher functioning.

$F(1, 48) = 23.184, p = .00, \eta^2 = .33$, and CBCL-Int scale, $F(1, 48) = 62.17, p = .00, \eta^2 = .56$, but not for the child-completed CES-D. Significant Condition \times Time interactions were present for the SCAS-P, $F(1, 48) = 7.24, p = .01, \eta^2 = .13, d = .31$, and CBCL-Int scale, $F(1, 48) = 7.60, p = .008, \eta^2 = .14, d = .56$, but not for the SCAS-C or CES-D. As demonstrated in Table II, participants in the NET condition demonstrated significantly greater reductions following treatment on both the SCAS-P and CBCL-Int scale compared to the WL condition.

Clinical Significance

Clinically significant improvement can be defined as changes that return deviant individuals to within nondeviant limits (Kendall & Grove, 1988). The CBCL-Int scale was used to differentiate between normal and clinical status at posttreatment, with a T score of 65 used as the clinical cutoff (Achenbach & Rescorla, 2001). As such, only children whose initial pretreatment internalizing T score exceeded 65 were included in this analysis ($n = 41$; 65% of the sample). The difference between the percentage

of children whose T score had reduced to the normal range ($T < 65$) for the NET condition (11 out of 19; 57.9%) compared to the WL condition (10 out of 22; 45.5%), $\chi^2(1, N = 39) = .65, p = .42$, at posttreatment was not statistically significant.

Completer Analysis: Follow-up

At 6-month follow-up, only the NET treatment condition ($N = 29$) was involved in statistical analyses as the WL was not available beyond the posttreatment assessment. At follow-up, there was one dropout and one family who declined to participate in the diagnostic interview, although questionnaires were completed and thus this family was included in analyses. A series of one-way repeated measures ANOVAs were conducted to investigate the maintenance of treatment effects from pretreatment to 6-month follow-up. Where significant main effects for time occurred, follow-up t -tests with Bonferroni corrections were performed to clarify which two time points were significantly different.

Anxiety Diagnoses

At 6-month follow-up, the percentage of children who no longer met DSM-IV criteria for their primary anxiety disorder continued to increase from posttreatment (9 out of 30; 30%) to 6-month follow-up (21 out of 28; 75%), suggesting that primary diagnostic status was further improved over time. At 6-month follow-up, the percentage of children no longer meeting criteria for any anxiety disorder also increased substantially from posttreatment (5 out of 30; 16.7%) to 6-month follow-up (17 out of 28; 60.7%).

Clinician Severity Rating, CGAS Ratings, and Number of Diagnoses

Univariate analyses across the three assessment occasions indicated significant effects over time for clinician severity rating, $F(2, 26) = 51.33, p = .000, \eta^2 = .80$; CGAS ratings, $F(2, 26) = 86.53, p = .000, \eta^2 = .87$; and for number of anxiety diagnoses, $F(2, 26) = 76.53, p = .000, \eta^2 = .86$. Follow-up t -tests indicated that for all three outcome measures, there were significant improvements from baseline to follow-up and from posttreatment to follow-up. Gains made by NET participants at posttreatment improved further at 6-month follow-up for clinician severity ratings ($t = 5.59, df = 27, p = .000$, two-tailed), CGAS ratings ($t = -6.47, df = 27, p = .000$, two-tailed), and number of diagnoses ($t = 5.39, df = 27, p = .000$, two-tailed).

Questionnaire Measures

Six-month questionnaire data were returned for 23 NET families, with occasional missing data across individual

measures. Univariate analyses revealed significant effects for Time for the SCAS-C, $F(2, 20) = 20.83$, $p = .000$, $\eta^2 = .68$, SCAS-P, $F(2, 21) = 22.11$, $p = .000$, $\eta^2 = .68$, and CBCL-Int scale, $F(2, 21) = 29.07$, $p = .000$, $\eta^2 = .74$, but not for the CES-D. Scores on the CES-D remained stable across all three time points. Follow-up *t*-tests indicated significant improvements on the SCAS-C from pre- to posttreatment ($t = 5.05$, $df = 24$, $p = .000$, two-tailed), with further reductions in anxiety from posttreatment to 6-month follow-up ($t = 2.50$, $df = 21$, $p = .02$, two-tailed). For the parent measures, post hoc *t*-tests revealed further significant reductions from posttreatment to 6-month follow-up for the CBCL-Int scale ($t = 2.80$, $df = 22$, $p = .01$, two-tailed) and the SCAS-P ($t = 4.56$, $df = 22$, $p = .000$, two-tailed), indicating that reductions made at posttreatment were enhanced over time.

Clinical Significance

There were no further reductions in the number of children demonstrating clinically significant improvement on the CBCL-Int at 6-month follow-up. Improvements made at posttreatment on this indicator were maintained, but not improved upon at follow-up, with approximately two-thirds of the sample (60.0%; 12 out of 20 children) falling within the normal range (*T* score <65) on the CBCL-Int scale at both these time points.

Client Satisfaction

Satisfaction data were collected for 23 children and 24 parents in the NET condition. Children and parents reported moderate levels of satisfaction following treatment (child ratings: $M = 3.60$, $SD = 0.75$; parent ratings: $M = 3.88$, $SD = 0.83$). These scores were comparable with previous research by Spence et al. (2006) who, using the same questionnaire, reported slightly higher satisfaction scores for families who completed half the therapy sessions online (child ratings: $M = 4.02$; parent ratings: $M = 3.86$). Also, treatment satisfaction scores were slightly lower than those reported by Spence et al. (2006) for families receiving the same program fully within the clinic (child ratings: $M = 4.26$; parent ratings: $M = 4.3$).

Compliance with Internet Sessions

Site usage was monitored through individual file logs stored in the administration section of the program, which documented the dates and times that participants accessed Web site sessions, as well as their responses to session activities. To be included in analyses, children were required to complete a minimum of three Internet sessions. A minimum of three sessions was chosen as it was

by this time that families had begun to implement anxiety management strategies. Only one participant completed less than three sessions, with this participant subsequently withdrawing from the program due to family health concerns.

Overall, a large proportion of NET parents and children failed to complete all Internet sessions. At posttreatment, only 60% of parents and 33.3% of children had completed all treatment sessions (excluding booster sessions). The average number of sessions completed at posttreatment was 5.13 out of 6 for parents (ranging from 2 to 6 sessions), and 7.5 out of 10 for children (ranging from 3 to 10 sessions). By 6-month follow-up, 72.3% of parents and 62% of children had completed all Internet sessions. At follow-up, on average, parents had completed 5.34 out of 6 sessions (ranging from 2 to 6 sessions) and children had completed 8.66 out of 10 sessions (ranging from 3 to 10 sessions). Further, only 34.4% of parents and 41.3% of children completed both booster sessions.

Intent-to-treat Sample

Analyses were repeated using an intent-to-treat sample, where missing scores at posttreatment were replaced with the value for that variable at the preceding occasion. As there was relatively little missing data, it was not surprising to find that the results of these analyses closely mirrored those using the completer sample and thus do not warrant separate interpretation.

Discussion

Taken together, the results of this study suggest that Internet-based CBT for child anxiety disorders, with minimal therapist support, offers promise as a treatment for a significant proportion of children with anxiety. The Internet program was associated with moderate levels of consumer satisfaction and high levels of credibility that were similar to those of clinic-based CBT programs for child anxiety disorders.

In terms of efficacy, over the 10-week treatment period, participants in the NET group demonstrated small but significantly greater improvements in anxiety compared to participants in the WL condition on some outcome measures. Specifically, at the 10-week assessment point, NET participants demonstrated greater improvements in clinician severity ratings and global assessment of functioning, although the percentage of children free of primary diagnosis (30%) and the frequency of diagnoses did not differ significantly from the WL condition. By 6-month follow-up, the percentage of children in the

NET condition who were free of their primary anxiety diagnosis had increased markedly to 75%. Further, the positive effects noted for severity and CGAS ratings at posttreatment continued, with further improvements noted at 6-month follow-up. By 6-month follow-up, the number of total anxiety diagnoses had also significantly reduced, indicating further improvements in diagnostic status.

In terms of questionnaire data, the NET participants demonstrated greater improvements from pre- to posttreatment compared to the WL according to parent report on the CBCL-Int and SCAS-P scales but not on the child-report SCAS-C or CES-D scales. By 6-month follow-up, children in the NET condition showed further significant reductions in anxiety symptoms according to both the parent and child SCAS but not according to the CES-D. Given that depression scores for our sample were in the mild range at baseline, however, it is not surprising that significant changes in depressive symptoms were not found.

In comparison to the results of previous studies involving clinic-based CBT for child anxiety, the results of the present study suggest that clinical outcomes were weaker at the postintervention point (10 weeks) but similar by 6-month follow-up. For example, James et al. (2005) reported average remission rates between 54% and 67% at posttreatment for various clinic-based CBT interventions compared to 30% in the present study. By 6-month follow-up, the finding that 75% of children were free of their primary anxiety diagnosis was consistent with the findings of several other clinic-based trials (Barrett, 1998; Kendall & Southam-Gerow, 1996; Shortt, Barrett, & Fox, 2001; Silverman et al., 1999; Spence et al., 2006).

A likely explanation for the delay in finding significant reductions in primary clinical diagnosis is that families in the NET condition tended to be slow in completing treatment. Indeed, only a minority of families (60% of parents and 33.3% of children) had completed all therapy sessions at the 10-week assessment point. Even though many families had not completed all the sessions, it was considered important to proceed with the posttreatment assessment at this point so as to provide a comparison with the WL condition and so that comparisons could be made with the results from other clinic-based efficacy trials of CBT treatments for child anxiety disorders. However, many parents and children continued to complete the online therapy sessions over the following weeks, such that by 6-month follow-up, the majority of families (72.3% of parents and 62% of children) had completed all therapy sessions. It appears that families may take longer to work through the therapy sessions when they are delivered over the Internet than when they are delivered

in the clinic. For this reason, 6-month follow-up assessment, rather than postassessment, may provide a more accurate indication of treatment efficacy, at least for the online treatment examined in this study.

It is difficult to compare compliance rates for the present Internet-based treatment with those found in clinic-based treatment–outcome studies as compliance data are rarely reported in detail. However, it appears that rates of compliance found in the current study are likely to be lower than those found in face-to-face therapy. For example, some clinic CBT studies have reported that between 80% and 100% of families completed treatment, although variable criteria have been used to define “completion” in terms of number of sessions attended (Cobham, Dadds, & Spence, 1998; Manassis et al., 2002; Shortt et al., 2001).

Limitations and Future Research Directions

There are several methodological limitations that must be noted. Clearly, the absence of the WL condition at 6-month follow-up makes it difficult to determine the extent to which the positive findings for the NET condition from posttreatment to 6-month follow-up might represent natural recovery rather than the effects of treatment. As it is possible that the continued improvements may represent effects of time, this data should be interpreted with caution. Although this point can be made with respect to most treatment–outcome studies for child anxiety, it is particularly salient here given that families were slow to complete treatment and that therapy improvements were relatively weak at the posttreatment assessment point. However, given that the NET participants demonstrated significantly greater improvement than WL participants at posttreatment for several of the outcome measures, it is possible to infer that the NET condition provided additional benefit to participants beyond the passage of time. Although inclusion of 6-month follow-up data for the WL would have strengthened the study, there are obvious ethical implications for withholding treatment for such an extended time period. Nonetheless, if families are slower to complete online interventions, then there is a need for future research to include appropriate control group comparisons in order to confirm the findings of this study.

It would also have been valuable in the present study to include a clinic-based treatment comparison condition to allow us to determine whether Internet-based interventions show efficacy similar to clinic-based interventions. The inclusion of a clinic comparison condition was beyond the scope and resources of the present study and given the large number of randomized controlled trials conducted with clinic-based child anxiety treatments and

the well-established and reported effect sizes for such studies (Ishikawa et al., 2007) may have been somewhat redundant. The results of our study demonstrate a medium to large effect size for Internet-based CBT for child anxiety that is similar to clinic-based studies, suggesting that online CBT warrants further investigation as a potential alternative to clinic-based approaches. Indeed, by 6-month follow-up, rates of improvement in terms of primary diagnosis were comparable to those found for clinic-based treatment. Thus, it would seem that online CBT may be beneficial for a significant proportion of clinically anxious children. Nevertheless, the lack of a clinic control group was a limitation of the present study and would have allowed a direct comparison for follow-up assessments. This should be considered in any future research of online CBT programs.

A further limitation of the present study is the lack of 12-month follow-up data. The present study is part of the first author's PhD thesis, during which there was insufficient time and resources to collect 12-month follow-up data. These data are currently being collected for the NET families as part of a further study to examine predictors of longer term outcome. With an expanded sample size, the impending study will examine the association between factors such as working alliance in an online environment, self-efficacy in utilizing a web-based approach to treatment, and treatment compliance as predictors of therapeutic outcome.

The current sample was highly educated, of moderate to high socioeconomic background, and predominantly born within Australia, which raises questions about the representativeness of the sample and the generalizability of results to the wider population. A final limitation of the current study was the exclusion of children with panic disorder, OCD, and posttraumatic stress disorder. Although there were only two people who contacted the program with primary OCD and none with primary panic disorder or posttraumatic stress disorder, the inclusion of children with these disorders would allow us to determine the extent to which they might benefit from this type of CBT program.

There are a number of issues that need to be further investigated within the current online child anxiety program. First, it is important to examine whether it is necessary to retain the two telephone contacts and the e-mail communications, and whether program efficacy is equivalent with a fully self-help approach. Second, it will also be essential to investigate the economic viability of Internet-based interventions to determine whether they are able to reduce the overall costs associated with therapy. With a

reduction in therapist contact, there is likely to be a reduction in costs, thus increasing the accessibility of online interventions. In the present study, it was estimated that the online therapist spent ~15 min per week reviewing session activities and preparing e-mail responses for each family, which could translate into a significant cost reduction in terms of therapist time. Third, future research should also examine ways to increase therapy compliance and to determine whether or not increases in compliance enhance treatment outcome. Finally, it would also be important to develop and evaluate additional individual modules for the treatment of panic disorder and OCD so that important disorder-specific information and treatment strategies for these problems can be addressed.

Overall, the results of this study suggest that an Internet approach incorporating only minimal therapist contact for CBT treatment of child anxiety disorders can produce clinically and statistically significant reductions in anxiety for a significant proportion of children with clinical levels of anxiety. Additional research is required to further examine the potential of such Internet approaches as an adjunct to, or replacement for, traditional face-to-face therapy. Further, the approach was well accepted by families, with a high level of credibility and expectancy for positive outcome and moderate levels of treatment satisfaction. Future research is now required to compare Internet therapy with clinic-based interventions and appropriate control comparison groups to determine the ideal level of therapist contact required for Internet interventions, and the ways in which they might be made available to the wider population. Internet-based interventions have the potential to provide innovative and widely accessible treatments for child anxiety disorders.

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References

- Achenbach, T. M. (1991). *Manual for the child behaviour checklist 4-18 and 1991 profile*. Burlington, VT: Department of Psychiatry: University of Vermont.
- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Research Centre for Children, Youth and Families.
- Anderson, P., Jacobs, C., & Rothbaum, B. O. (2004). Computer-supported cognitive behavioral treatment of anxiety disorders. *Journal of Clinical Psychology, 60*(3), 253–267.
- Barrett, P. M. (1998). Evaluation of cognitive-behavioral group treatments for childhood anxiety disorders. *Journal of Clinical Child Psychology, 27*(4), 459–468.
- Barrett, P. M., Dadds, M. R., & Rapee, R. M. (1996). Family treatment of childhood anxiety: A controlled trial. *Journal of Consulting & Clinical Psychology, 64*(2), 333–342.
- Barrett, P. M., Duffy, A. L., Dadds, M. R., & Rapee, R. M. (2001). Cognitive-behavioral treatment of anxiety disorders in children: Long-term (6-year) follow-up. *Journal of Consulting & Clinical Psychology, 69*(1), 135–141.
- Booth, M. L., Bernard, D., Quine, S., Kang, M. S., Usherwood, T., Alperstein, G., et al. (2004). Access to health care among Australian adolescents young people's perspectives and their sociodemographic distribution. *Journal of Adolescent Health, 34*(1), 97–103.
- Borkovec, T. D., & Nau, S. D. (1972). Credibility of analogue therapy rationales. *Journal of Behavior Therapy & Experimental Psychiatry, 3*(4), 257–260.
- Calam, R., Cox, A., Glasgow, D., Jimmieson, P., & Larsen, S. G. (2000). Assessment and therapy with children: Can computers help? *Clinical Child Psychology & Psychiatry, 5*(3), 329–343.
- Cobham, V. E., Dadds, M. R., & Spence, S. H. (1998). The role of parental anxiety in the treatment of childhood anxiety. *Journal of Consulting and Clinical Psychology, 66*(6), 893–905.
- Costello, E., Angold, A., & Keeler, G. (1999). Adolescent outcomes of childhood disorders: The consequences of severity and impairment. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*(2), 121–128.
- Costello, E., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry, 60*(8), 837–844.
- Dadds, M. R., & Roth, J. H. (2001). Family processes in the development of anxiety problems. In M. W. Vasey, & M. R. Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 75–81). London: Oxford University Press.
- Dewis, L. M., Kirkby, K. C., Martin, F., Daniels, B. A., Gilroy, L. J., & Menzies, R. G. (2001). Computer-aided vicarious exposure versus live graded exposure for spider phobia in children. *Journal of Behavior Therapy & Experimental Psychiatry, 32*(1), 17–27.
- Essau, C. A., Conrads, J., & Petermann, F. (2000). Frequency, comorbidity, and psychosocial impairment of anxiety disorders in German adolescents. *Journal of Anxiety Disorders, 14*(3), 263–279.
- Essau, C. A., Conrads, J., & Petermann, F. (2002). Course and outcome of anxiety disorders in adolescents. *Journal of Anxiety Disorders, 16*(1), 67–81.
- Fung, D. S. S., Manassis, K., Kenny, A., & Fiksenbaum, L. (2002). Web-based CBT for selective mutism. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*(2), 112–113.
- Ginsburg, G. S., La Greca, A. M., & Silverman, W. K. (1998). Social anxiety in children with anxiety disorders: Relation with social and emotional functioning. *Journal of Abnormal Child Psychology, 26*(3), 175–185.
- Griffiths, K. M., & Christensen, H. (2006). Review of randomised controlled trials of internet interventions for mental disorders and related conditions. *Clinical Psychologist, 10*(1), 16–29.
- In-Albon, T., & Schneider, S. (2006). Psychotherapy of childhood anxiety disorders: A meta-analysis. *Psychotherapy and Psychosomatics, 76*(1), 15–24.
- Ishikawa, S., Okajima, I., Matsuoka, H., & Sakano, Y. (2007). Cognitive behavioural therapy for anxiety disorders in children and adolescents: A meta-analysis. *Child & Adolescent Mental Health, 12*(4), 164–172.
- James, A., Soler, A., & Weatherall, R. (2005). Cognitive behavioural therapy for anxiety disorders in children and adolescents. *Cochrane Database Systematic Reviews*, Issue 4. Art. No.: CD004690. 004610.001002/14651858.CD14004690.pub14651852.
- Kendall, P. C. (1994). Treating anxiety disorders in children: Results of a randomized clinical trial. *Journal of Consulting & Clinical Psychology, 62*(1), 100–110.
- Kendall, P. C., Flannery-Schroeder, E., Panichelli-Mindel, S. M., Southam-Gerow, M., Henin, A., & Warman, M. (1997). Therapy for youths with anxiety disorders: A second randomized clinical trial. *Journal of Consulting & Clinical Psychology, 65*(3), 366–380.

- Kendall, P. C., & Grove, W. M. (1988). Normative comparisons in therapy outcome. *Behavioral Assessment. Special Issue: Defining Clinically Significant Change*, 10(2), 147–158.
- Kendall, P. C., & Southam-Gerow, M. A. (1996). Long-term follow-up of a cognitive-behavioral therapy for anxiety-disordered youth. *Journal of Consulting & Clinical Psychology*, 64(4), 724–730.
- Last, C. G., Hansen, C., & Franco, N. (1997). Anxious children in adulthood: A prospective study of adjustment. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(5), 645–652.
- Lynham, H. J., & Rapee, R. M. (2005). Agreement between telephone and in-person delivery of a structured interview for anxiety disorders in children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 44(3), 274–282.
- Manassis, K., Mendlowitz, S. L., Scapillato, D., Avery, D., Fiksenbaum, L., Freire, M., et al. (2002). Group and individual cognitive-behavioral therapy for childhood anxiety disorders. A randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(12), 1423–1430.
- Muris, P., Schmidt, H., & Merckelbach, H. (2000). Correlations among two self-report questionnaires for measuring DSM-defined anxiety disorder symptoms in children: The Screen for Child Anxiety Related Emotional Disorders and the Spence Children's Anxiety Scale. *Personality & Individual Differences*, 28(2), 333–346.
- Nauta, M. H., Scholing, A., Rapee, R. M., Abbott, M., Spence, S. H., & Waters, A. (2004). A parent-report measure of children's anxiety: Psychometric properties and comparison with child-report in a clinic and normal sample. *Behaviour Research & Therapy*, 42(7), 813–839.
- Nelissen, I., Muris, P., & Merckelbach, H. (1995). Computerized exposure and in vivo exposure treatments of spider fear in children: Two case reports. *Journal of Behavior Therapy & Experimental Psychiatry*, 26(2), 153–156.
- Newman, M. G. (2004). Technology in psychotherapy: An introduction. *Journal of Clinical Psychology*, 60(2), 141–145.
- Nicholas, J., Oliver, K., Lee, K., & O'Brien, M. (2004). Help-seeking behaviour and the Internet: An investigation among Australian adolescents. *Australian e-Journal for the Advancement of Mental Health*, 3(1). Retrieved August 15, 2008, from <http://www.auseinet.com/journal/vol3iss1/index.php>.
- Proudfoot, J. G. (2004). Computer-based treatment for anxiety and depression: Is it feasible? Is it effective? *Neuroscience & Biobehavioral Reviews. Special Issue: Festschrift in Honour of Jeffrey Gray—Issue 1: Anxiety and Neuroticism*, 28(3), 353–363.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1(3), 385–401.
- Radloff, L. S. (1991). The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *Journal of Youth & Adolescence*, 20(2), 149–166.
- Rapee, R. M., & Spence, S. H. (2004). The etiology of social phobia: Empirical evidence and an initial model. *Clinical Psychology Review*, 24(7), 737–767.
- Rapee, R. M., Wignall, A., Hudson, J. L., & Schniering, C. A. (2000). *Treating anxious children and adolescents: An evidence-based approach*. Oakland, CA: Harbinger Publications.
- Schaffer, D., Gould, M. S., Brasic, J., Ambrosini, P., Fisher, P., Bird, H. R., et al. (1983). A Children's Global Assessment Scale (CGAS). *Archives General Psychiatry*, 40, 1228–1231.
- Shortt, A. L., Barrett, P. M., & Fox, T. L. (2001). Evaluating the FRIENDS Program: A cognitive-behavioral group treatment for anxious children and their parents. *Journal of Clinical Child Psychology*, 30(4), 525–535.
- Silverman, W. K., & Albano, A. M. (1996). *Anxiety disorders interview schedule for children for DSM-IV: Child and parent versions*. San Antonio, TX: The Psychological Corporation—Harcourt, Brace & Company.
- Silverman, W. K., Kurtines, W. M., Ginsburg, G. S., Weems, C. F., Lumpkin, P. W., & Carmichael, D. H. (1999). Treating anxiety disorders in children with group cognitive-behavioral therapy: A randomized clinical trial. *Journal of Consulting & Clinical Psychology*, 67(6), 995–1003.
- Silverman, W. K., & Treffers, P. D. A. (2001). *Anxiety disorders in children and adolescents: Research, assessment and intervention*. New York: Cambridge University Press.
- Spek, V., Cuijpers, P., NyklÁicek, I., Riper, H., Keyzer, J., & Pop, V. (2007). Internet-based cognitive behaviour therapy for symptoms of depression and

- anxiety: A meta-analysis. *Psychological Medicine*, 37(3), 319–328.
- Spence, S. H. (1998). A measure of anxiety symptoms among children. *Behaviour Research and Therapy*, 36, 545–566.
- Spence, S. H. (1999). *Spence children's anxiety scale (parent version)*. Brisbane: University of Queensland.
- Spence, S. H., Barrett, P. M., & Turner, C. M. (2003). Psychometric properties of the Spence children's anxiety scale with young adolescents. *Journal of Anxiety Disorders*, 17(6), 605–625.
- Spence, S. H., Donovan, C., & Brechman-Toussaint, M. (2000). The treatment of childhood social phobia: The effectiveness of a social skills training-based, cognitive-behavioural intervention, with and without parental involvement. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 41(6), 713–726.
- Spence, S. H., Donovan, C. L., March, S., Gamble, A., Anderson, R., Prosser, S, et al. (2008). Online CBT in the treatment of child and adolescent anxiety disorders: Issues in the development of BRAVE-ONLINE and two case illustrations. *Behavioural & Cognitive Psychotherapy*, 36(4), 411–430.
- Spence, S. H., Holmes, J. M., March, S., & Lipp, O. V. (2006). The feasibility and outcome of clinic plus Internet delivery of cognitive-behavior therapy for childhood anxiety. *Journal of Consulting and Clinical Psychology*, 74(3), 614–621.