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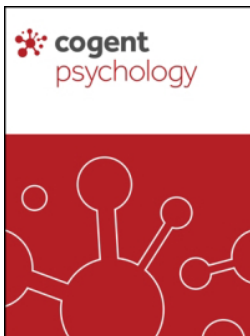
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CLINICAL PSYCHOLOGY | RESEARCH ARTICLE

Peer coach support in internet-based cognitive behavioral therapy for college students with social anxiety disorder: efficacy and acceptability

Chandra L. Bautista¹, Allura L. Ralston^{2*}, Rebecca L. Brock² and Debra A. Hope²

Abstract: Social anxiety disorder is common among emerging adults and is associated with serious functional impairment. Cognitive-behavioral therapy (CBT) is an effective intervention for social anxiety. An online version may increase access but low completion rates limit utility. This study investigated a self-guided, internet-based CBT (ICBT) with peer coach support. Participants were 35 undergraduate students randomized for immediate treatment (IT) or wait-list control (WL) in a randomized controlled trial design. IT participants completed a six-week ICBT program on their own and met briefly with a minimally trained undergraduate student as a “coach” between each lesson. IT participants had a greater decline in social anxiety relative to WL participants. High treatment retention and satisfaction ratings demonstrate the acceptability of this online intervention with peer coach support. The higher than expected enrollment from international students suggests ICBT may serve hard-to-reach college populations. This model of care could augment traditional mental health services to expand the availability of care.

Subjects: Mental Health; Psychiatry & Clinical Psychology - Adult; Cognitive Behavior Therapy

ABOUT THE AUTHOR

Dr. Chandra Bautista is a staff psychologist at the Michael E. DeBakey VA Medical Center (MEDVAMC). Dr. Bautista is interested in using innovative adaptations to increase accessibility and improve outcomes for evidence-based treatment of anxiety disorders. Dr. Bautista is also interested in transdiagnostic factors in anxiety, as well as mechanisms of change in exposure-based therapies. Dr. Bautista continues to collaborate on research projects focused on transdiagnostic treatment of anxiety disorders through her work at MEDVAMC.

PUBLIC INTEREST STATEMENT

Social anxiety disorder is common among emerging adults and often leads to occupational, educational, and social difficulties. Cognitive-behavioral therapy (CBT) is an effective intervention for social anxiety. This study investigated a self-guided, internet-based CBT treatment for socially anxious college students. Participants were randomly assigned to the treatment or wait-list group. The participants in the treatment group completed the internet-based CBT program and had access to a peer “coach” who was trained to help answer questions and provide support. All participants in the treatment group completed the treatment and their ratings of their relationship with their “coach” suggested they found the support from their “coach” helpful. Additionally, the participants in the treatment group experienced decreases in symptoms of social anxiety by the end of treatment. A high number of international students participated, suggesting internet-based treatment may often serve hard-to-reach college populations.

KeyWords: internet-based cognitive-behavioral treatment; social anxiety; college students; clinical trial

Social anxiety disorder is one of the most common disorders, with a 12% lifetime prevalence in the general population (Kessler et al., 2005) and similar prevalence among college samples (e.g., Russell & Shaw, 2009). Social anxiety is characterized by persistent fears of social situations that impair functioning across multiple domains (Heimberg et al., 2010). Among college students, social anxiety interferes with relationships and social engagement (Bouhechba et al., 2018) as well as academic functioning (Archbell & Coplan, 2021; Brook & Wiloughby, 2015). College students may use alcohol or marijuana for anxiety management or to fit into a peer group, potentially leading to substance abuse-related problems (Ham & Hope, 2006; Villarosa-Hurlocker et al., 2019). Given the prevalence of social anxiety and associated impairment, effective and accessible treatment is a mental health priority on campus.

Both medication (Hoffman & Mathew, 2008) and cognitive-behavioral treatments (CBT; Hofmann & Smits, 2008; Norton & Price, 2007) have strong evidence of efficacy for social anxiety disorder. Outcomes are comparable for pharmacological and CBT treatments in the short term (Heimberg et al., 1998), but the gains provided by CBT have been found to continue after the cessation of treatment, while medication more often improves symptoms only, when the individual is taking it (e.g., Liebowitz et al., 1999; Otto et al., 2000). The combination of CBT and medication has been associated with faster, and possibly superior, gains compared to CBT alone (Otto et al., 2005), but it has also been associated with higher rates of relapse once medication is discontinued (e.g., Pontoski & Heimberg, 2010). Due to the durability of long-term treatment gains, CBT continues to be a preferred method of treatment when it is available. Although much of the research on CBT for social anxiety has drawn samples from the general population, CBT for social anxiety is efficacious among college students in a variety of countries as well (e.g., Bjornsson et al., 2011; Damer et al., 2010; Hapangama et al., 2021).

1. Treatment

Despite these encouraging findings, many people seeking treatment do not receive evidence-based care (Shafran et al., 2009). In primary care settings, only about 36% of the individuals with social anxiety receive any treatment and only 20% are referred to cognitive-behavioral therapy (Jameson & Blank, 2010) with even less access to care in rural areas (Jones-Hazeldine et al., 2006). Individuals with social anxiety perceive many barriers to care, including financial and logistical impediments (Goettner et al., 2020). Social anxiety may be especially prevalent among underserved groups (Grace et al., 2016; Olfson et al., 2000), but these individuals are also less likely to receive treatment with a mental health professional (Safran et al., 2009; Wang et al., 2005). Given the typical age of onset for social anxiety disorder in adolescence (Grant et al., 2005), these findings suggest that most socially anxious college students may arrive at campus without having accessed high-quality care. Barriers to care may continue on campus including stigma around seeking treatment, lack of knowledge of available resources, and lack of time (Gulliver et al., 2010), all of which may be exacerbated by racial and ethnic minority groups (e.g., Holden et al., 2014). Furthermore, the well documented rising mental health needs on campuses in the face of finite services may also limit availability of care (Gallagher, 2015; Xiao et al., 2017). Thus, having a variety of treatment options available may help socially anxious college students access the treatment they need.

1.1. Treatment delivery alternatives

One solution to overcoming barriers to mental health care is self-guided, internet-delivered cognitive-behavioral treatment for social anxiety, which has shown good efficacy (e.g., Kampmann et al., 2016). Online programs are effective and generally acceptable to college students (Kahlke et al., 2019; Lattie et al., 2019), and address barriers such as social stigma and access (Attridge et al., 2020; Ralston, Andrews, & Hope, 2019). The biggest challenge across online mental health with all populations is maintaining engagement through completion of the intervention (Carlbring et al., 2006; Rapee et al.,

2007). Strategies to help maintain engagement include limited therapist contact or text messaging (e.g., Kählke et al., 2019). However, the more therapist time needed to keep clients engaged in the program, the greater the loss in efficiency promised by online CBT.

Perhaps, the most well-studied online CBT intervention for social anxiety is a self-guided, internet-based CBT (ICBT), originally entitled the Shyness Program, developed by an Australian group (e.g., Titov et al., 2008). ICBT has interactive features to promote engagement and help improve completion rates. Several randomized controlled trials have consistently supported the efficacy of the program (Titov et al., 2008; Titov et al., 2009) with large effect sizes (.80 to 1.47) for pre- to post-treatment changes in primary outcome measures (Titov et al. 2008; Johnston et al., 2011; Titov et al., 2009). Additional studies have found that interpersonal support during ICBT is associated with greater improvement regardless of whether it is provided by a clinician or layperson (Johnston et al., 2011; Titov et al., 2008). Further, participants rated the treatment favorably in terms of its presentation and their satisfaction with results (e.g., Titov et al., 2008; Titov et al., 2009). These findings are encouraging as they suggest that self-guided treatments can be enhanced by interpersonal support, even if that support does not come from a trained therapist, maximizing benefits for individuals with social anxiety while reducing clinician burden.

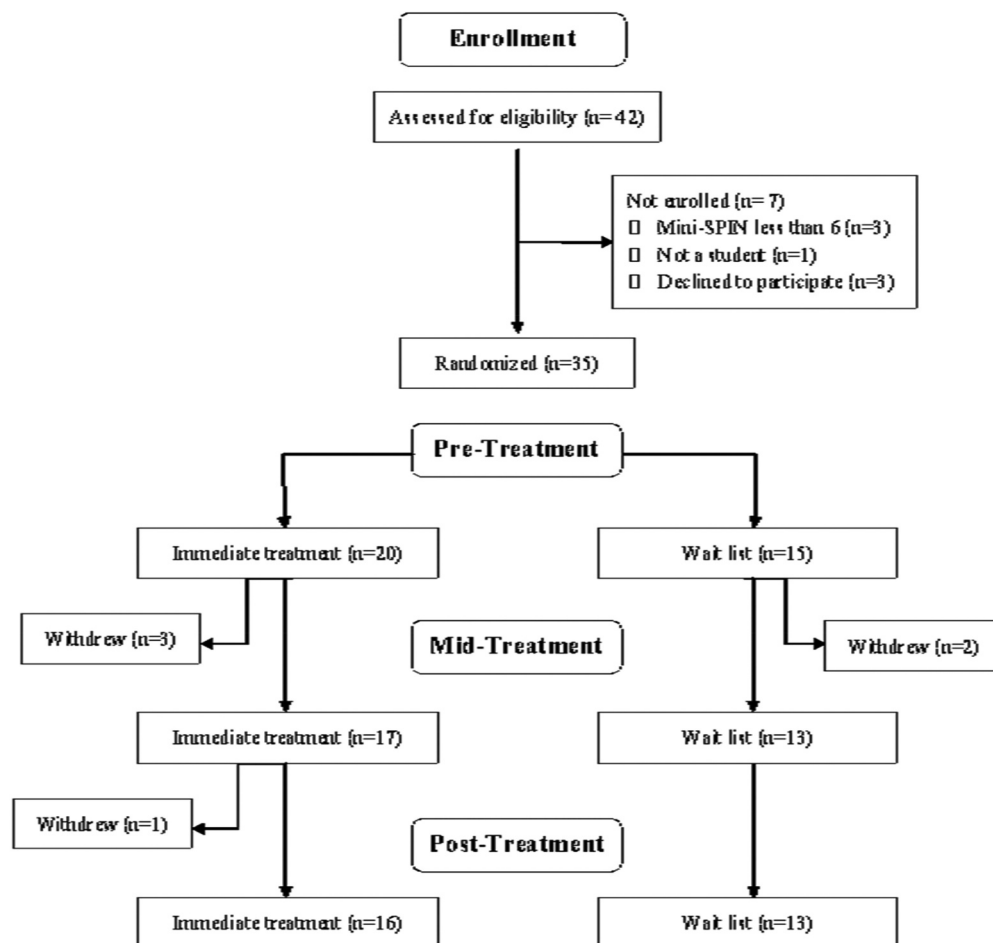
1.2. Peer support and lay mental health

Across mental health care systems including on college campuses, in rural and underserved communities, and within public mental health, peer, or lay mental health services are seen as a way to extend the availability of care when resources are limited (Gillard, 2019). Such lay care can be part of a formalized system such as community health workers or *promotores*, (Centers for Disease Control, 2016). On campus, lay mental health care includes organized mental health programming conducted by peers (e.g., Byrom, 2018) or basic mental health training for support and referral for students in key roles (e.g., assistants in residence halls). In all of these cases, the lay service providers are members of the community, which may reduce stigma associated with seeking mental health care and increase accessibility. Community-based lay workers can enhance treatment gains without the need for heavy reliance on mental healthcare professionals (Abas et al., 2016; Horgan et al., 2013; Rhodes et al., 2009). To date, there has been no research on whether lay or peer support can effectively serve as an adjunct to empirically supported online treatments for social anxiety in the United States.

1.2.1. Present study

The growing demand for mental health services on college campuses, often combined with shrinking budgets, means new models of care are needed. With support from peer coaches, ICBT may minimize the burden on clinicians without a reduction in quality of care. Thus, the primary aim of the present study was to utilize a randomized controlled trial design to conduct an early acceptability and feasibility test of this intervention with a U.S. sample, with support coming from a member of the participants' community. Consistent with this aim, participant and peer coach support appraisals of the intervention were the primary variables of interest, with replication of previous efficacy findings as a secondary goal of the study. Note that peers providing lay support were called "coaches" with participants to indicate both that they were not trained therapists and to reduce social stigma. First, it was hypothesized that participants in the immediate treatment condition (ICBT with coach support) would experience a greater rate of reduction in symptoms of social anxiety than participants in the wait list condition. Second, it was hypothesized that ratings of treatment credibility, expectations for treatment outcome, and satisfaction would be high and similar to those in the previous studies examining this program in Australia (Andrews et al., 2010; Johnston et al., 2011). Third, it was hypothesized that participants would rate their alliance highly with their coaches, consistent with previous findings on lay health workers (Pinard et al., 2012). Fourth, it was hypothesized that coaches would rate highly their ability to be effective and adhere to their role.

Figure 1. CONSORT diagram indicating the flow of participants from screening through the end of the initial treatment period.



2. Methods

2.1. Design

This study presents a 2 (immediate treatment or waiting list) × 3 (Assessment at baseline, 3-weeks, and 6 weeks) repeated measures randomized control trial design.¹ The treatment was delivered online with weekly face-to-face meetings with peer coaches.

2.2. Participants

Participants were recruited through posted flyers on the university campus. Of the 42 individuals who completed the screening for the study, 38 were determined to meet the inclusion/exclusion criteria described below. The three eligible participants declined to participate after screening, leaving a final sample of 25 women (71.4%) and 10 men (28.6%) ranging in age from 19 to 24 years ($M = 21.86$, $SD = 4.82$). The majority of participants self-identified as European American ($n = 25$, 71.4%), four (11.4%) identified as African American (11.4%), three (8.6%) as Hispanic/Latinx (8.6%), and six (17.1%) as Asian/Asian American/Pacific Islander. (Numbers sum to greater than 100% as some participants checked multiple identities.) Further, most participants identified as heterosexual ($n = 33$, 94.2%), with one (2.9%) person self-labeling as bisexual (2.9%), and one (2.9%) as gay or lesbian. No other sexual orientations, gender identities, or race/ethnicities were endorsed. The sample included six first-year students (17.1%), eight sophomores (22.9%), 11

juniors (31.4%), and nine seniors (25.7%) and one who had graduated (2.9%). Participants identified 23 different majors and six participants (17.1%) indicated they were international students.

Inclusion criteria were a) being at least 18 years of age, b) current enrollment as an undergraduate student at the university or graduation within the last 12 months; c) a score of 6 or higher on the Mini Social Phobia Inventory (Mini-SPIN; Connor et al., 2001); d) the ability to provide consent; and e) availability for weekly meetings for 6 weeks. Previous research has indicated a score of 6 or higher on the Mini-SPIN is likely associated with a diagnosis of SAD (Connor et al., 2001). No potential participants needed an immediate referral to emergency services due to current suicidal ideation. Three of the four excluded participants failed to meet the Mini-SPIN criterion and one was not a current or recent university student. See Figure 1 for the CONSORT diagram.

2.3. Measures

2.3.1. Social anxiety and distress

2.3.1.1. *Screening for inclusion.* The Mini-Social Phobia Inventory (Mini-SPIN; Connor et al., 2001) consists of three self-rated items assessing the symptoms of social anxiety rated on a 5-point Likert-type scale. Total scores range from 0 to 18. The Mini-SPIN has demonstrated 90% accuracy (efficiency) in diagnosing the presence or absence of social anxiety disorder using a cutoff score of 6 or higher (Connor et al., 2001; Weeks et al., 2007) and it has good internal consistency (Cronbach's $\alpha = .79$; Weeks et al., 2007).

2.3.1.2. *Social anxiety.* The Social Interaction Anxiety Scale (SIAS-6; Peters et al., 2012) measures fear of general social interactions (e.g., talking to others) using a five-point, Likert-type scale. The SIAS-6 has shown similar internal consistency (Cronbach's $\alpha = 0.90$), reliability, and sensitivity compared to the long version of the measure (Peters et al., 2012). Scores ranged from 0 to 24, with higher scores indicating more severe social anxiety. Participants completed the SIAS-6 at baseline and after 3 and 6 weeks.

2.3.2. Intervention acceptability

2.3.2.1. *Intervention credibility and expectancy.* Participants in immediate treatment completed the Borkovec and Nau (1972) Credibility/Expectancy Questionnaire (CEQ) at the middle and end of the intervention. The 3-item credibility subscale uses a 9-point Likert-type scale and items are summed for a total scale. The 3-item expectancy scale also uses Likert-type scale and items were standardized and summed as recommended by Devilly and Borkovec (2000). The CEQ has demonstrated strong internal consistency within each factor in clinical samples (Deville & Borkovec, 2000). For the present study, the CEQ Cronbach's α ranged from fair ($\alpha = .74$) at time 2 to excellent ($\alpha = .93$) at time 3.

2.3.2.2. *Overall client satisfaction.* The eight-item Client Satisfaction Questionnaire (CSQ-8; Larsen et al., 1979) assesses overall satisfaction, with mental health services using a four-point, Likert-type scale. The CSQ-8 has strong internal consistency (Cronbach's $\alpha = 0.87$) and predicts a continuation in treatment 1 month after intake (Attkisson & Zwick, 1982). Scores are calculated by summing the response values, and can range from 8 to 32 with greater scores indicating greater satisfaction. For the present study, the immediate treatment group completed the CSQ-8 at mid and post treatment with Cronbach's α from poor ($\alpha = .51$) at time 2 to good ($\alpha = .84$) at time 3.

2.3.2.3. *Rapport with coaches.* Participants' perspective on their relationship with the coach was assessed with the Bond subscale of the Working Alliance Inventory-Short Revised version (WAI-SR-Bond; Munder et al., 2010) at the middle and end of treatment. For the present study, wording was modified to include the word "coach" in place of "therapist." The WAI-SR has shown good internal consistency (Cronbach's $\alpha = .91$; Hatcher & Gillaspay, 2006). The 5-point Likert-type scale was summed up with a possible range 4 to 20, with higher scores indicating more positive perceptions of the bond with the coach.

2.4. Fidelity

2.4.1. Coach fidelity checklist—coach-rated and independently rated versions. Two versions of the same questionnaire were created for the present study to measure the coaches' ability to adhere to study protocol, their rapport with participants, and their overall effectiveness as a coach. The two versions of the measure included identical wording with the exception of reference to self or other (e.g., "Please rate *your/the coach's* rapport . . ."). The first half of the measure is a checklist in which the respondent marks "yes" or "no" to indicate whether specific tasks were completed by the coach during a given session. Scoring for this section is calculated as a percentage of items marked "yes," with an acceptable benchmark set a priori at 80% affirmative responses. The second half of the measure includes three items inquiring about the coach's effectiveness and the rapport between the coach and participant. This section of the measure utilizes a five-point, Likert-type scale, with response labels ranging from poor to excellent. No total score is derived for these items; rather, each item is considered individually.

The coach-rated version of the measure was completed by the coaches after each meeting with a participant. Although the two coaches also completed an optional informal exit interview upon completion of the study, no formal qualitative analyses were conducted due to the small sample size. In addition, the independently rated version of the measure was completed by a research assistant based on their review of a sample of audio recordings of coach meetings. This research assistant was trained to be familiar with the ICBT program and the expectations for the coach role so that they could adequately assess the adherence to protocol. To establish reliability, the first author and the research assistant completed practice ratings of audio recordings. Scores were compared and reconciled, and training continued until the research assistant and first author reached perfect agreement on five independently rated recordings. These practice recordings were not the same recordings used in the fidelity check sample. After the training process, the independent rater used the Coach Fidelity Checklist to assess fidelity in a sample of one-quarter of the recordings of coach meetings.

2.5. Procedure

After informed consent, screening, and baseline measures, the 35 eligible participants were randomly assigned to either immediate ($n = 20$) or delayed ($n = 15$) treatment using a random number generator with a random bias towards more participants in immediate treatment to efficiently maximize the power of the design (e.g., Barlow et al., 2000) without unnecessarily asking participants to wait for the intervention given the known effect size for the treatment versus wait-list comparison (Titov et al., 2008). Next, the first author introduced participants in the immediate treatment condition to the intervention, described below. Participants in the delayed treatment condition were informed they could contact the first author at any time if needed but that they would be sent an online link for measures after 3 and 6 weeks. All participants completed measures at baseline, timepoint 2 (mid treatment; 3-weeks), and timepoint 3 (post treatment; 6-weeks). No follow-up assessment was conducted. At the end of 6 weeks, all 15 delayed treatment participants were interested in treatment, but none wished to utilize the peer coaches. Participants were given the option to choose if they would like to work with a coach in order to limit the burden on participants of the required in-person meetings if they preferred not to use this resource. Participants in the delayed treatment condition had already waited for treatment and completed assessment measures. Given their previous interactions with study personnel, it was hoped that they would engage with peer coaches despite the avoidance characteristics of social anxiety and the discontinuation of assessments and associated compensation described below. This design does not allow us to draw explicit conclusions about the impact of peer coaches on engagement and retention, the primary focus of the study was primarily on the participant-coach dyadic relationship and whether peer coaches could provide support to complete and benefit from online intervention. While all but 2 participants in the delayed condition completed the measures at time point 3, no participant in the delayed treatment condition completed the online intervention. Participants were compensated with \$20, \$10 for pre-treatment, and \$10 for 6-week assessments. All participants were added to a drawing for an iPad valued at \$300 at each data collection point with a maximum of three chances to win. All procedures were approved by the University Institutional Review Board.

2.6. Intervention

Participants completed the Social Phobia course at This Way Up Clinic (thiswayupclinic.org.au). The treatment is a standard cognitive-behavioral intervention for social anxiety delivered in an online format through six modules to be completed within 6 to 10 weeks. Participants were provided online access, instructions, and a recommended spacing of the modules. The program includes text-based instruction and a story format following a fictional character with social anxiety. There are two modules for psychoeducation, and one each for individualized treatment planning, cognitive restructuring, exposure, and relapse prevention. Each module includes core treatment content, homework assignments, and self-monitoring forms. Further details on the content and development of the online materials are available from several published sources including Titov et al. (2008). For the present study, participants completed online modules at their homes according to their own schedules.

2.6.1. Coaches

Throughout treatment, participants met in person weekly with their coach. Coaches were five undergraduate students ($Age M = 20.50, SD = 1.29$). Four of the coaches identified as female and one did not identify as either male or female. Three coaches identified as European American, one as Asian/Asian American, and one as Native American/American Indian. Four of the coaches identified as heterosexual and one as bisexual. Coaches were assigned to participants in a rotation, without matching to participant characteristics due to logistical constraints in coach availability and scheduling.

Coaches participated in three, one-hour group training sessions led by the first author. In these meetings, the coaches reviewed and discussed a manual containing general guidelines for the structure of their meetings with participants and role-played potential interactions with participants. The role of coaches was to check in with participants about their progress in the ICBT program, answer questions about the program, and prompt participants to complete the exercises; they were not to provide therapy of any kind. Similar to the procedure in Johnston et al. (2011), if participants sought help with the treatment procedures themselves, coaches directed them back to review the module corresponding to the treatment procedures with which they were experiencing difficulty. Initially, these meetings were planned to last 15 to 30 minutes based on descriptions from previous studies. In the present study, the meetings ranged from 5 to 30 minutes ($M = 11.73, SD = 6.57$). Coaches scheduled 30-minute meetings with participants but were instructed to use as much time as needed to cover the items on the Coach Fidelity Checklist. During the study, the first author provided brief supervision to the coaches after each meeting with participants.

Procedural choices and other study decisions were made in the context of the research team's overall focus on dissemination of evidence-based treatment to those most in need. This study was conceptualized in the overall context of potentially using community health workers to support internet delivery services in rural areas. This is the first step by exploring the use of peer coach support in a campus context, which serves both to test this model as a way to meet campus needs as well as potential extensions to non-campus rural communities.

3. Data analytic strategy and results

3.1. Preliminary data procedures

Prior to conducting each analysis, data were found to be normally distributed unless otherwise noted below. Missing data were uniformly observed across the outcome variables due to attrition in the IT condition ($n = 4$) and the WL condition ($n = 2$).

A series of preliminary analyses were conducted to examine the effectiveness of random assignment. A one-way analysis of variance (ANOVA) revealed that the two conditions did not differ in age (IT $M = 22.10, SD = 6.09$; WL $M = 21.53, SD = 2.45$), $F(1, 33) = .12, p = .74, d = .11$. Finally, a one-way ANOVA indicated that there was no significant difference in the initial severity of social

anxiety between the IT group ($M = 8.40$, $SD = 1.70$) and the WL group ($M = 8.27$, $SD = 1.39$), as measured by the Mini-SPIN, $F(1, 33) = .06$, $p = .81$, $d = .08$. There were insufficient cell sizes to conduct additional Pearson's chi-square tests examining all potential differences in demographics across the two treatment conditions, though visual inspection indicated similar makeup in the two groups. For example, men ($n = 10$) were underrepresented in the present sample, but they were evenly distributed across the IT condition ($n = 4$) and the wait list condition ($n = 6$).

3.1.1. Study retention

Based on previous studies examining the ICBT, retention for the present study was expected to be between 70% and 85% (Johnston et al., 2011; Titov et al., 2009). Of the 35 participants who consented to the study, 29 (83%) completed the study by responding to the survey at the final time point. Study completion was similar for the IT condition ($n = 16$; 80%) and the WL condition ($n = 13$; 87%), $\chi^2(1) = .27$, $p = .61$, $r = .09$. Missing data were uniformly observed across the outcome variables due to attrition in the IT condition ($n = 4$) and the WL condition ($n = 2$). The treatment conditions were dummy-coded such that the immediate treatment = 1 and waitlist control = 0. As mentioned above, usage of the intervention (Christensen et al., 2009) was low in the WL condition with no participants the online intervention, stopping after, on average, two of the six modules. In contrast, usage was uniformly high in IT conditions with nearly all participants completing all six modules.

3.1.2. Change in social anxiety

To test the change in social anxiety across the repeated measurements for both conditions, growth curve modeling (GCM) techniques were implemented with HLM 7 software (Bryk & Raudenbush, 1987; Raudenbush & Bryk, 2002). There are many advantages to using GCM for analyzing repeated measures (Feingold, 2009). First, GCM estimates within-person change for a variable (e.g., social anxiety) and allows for the examination of differences in average trajectories of change between conditions (e.g., wait-list versus immediate treatment). Second, GCM accounts for interdependence among repeated measures nested within participants. Third, GCM retains all cases despite missing data at Level 1 (repeated measures) through maximum likelihood estimation. Since GCM uses data from all participants despite missing values, it produces less biased estimates of treatment effects and eliminates the need for imputation of missing values (Feingold, 2009). In the present study, full information maximum likelihood estimation (FIML) is used, and estimates are reported with robust standard errors to account for any violations of normality. The ICC from the unconditional model was .56 for social anxiety.

Descriptive information about social anxiety across the three time points is reported in Table 1 and 2. To examine the nature of change in social anxiety over time, we tested GCM models with time entered as a Level 1 covariate, measured as the number of follow-up assessments since baseline (0 = baseline, 1 = timepoint 2, 2 = timepoint 3). Results from a nested model comparison indicate that the linear change model of social anxiety (with Time as a Level 1 random effect) is a better fit than the random intercept model excluding Time, $\chi^2(3) = 17.17$, $p < .001$. Results suggest that there was a systematic linear change in social anxiety scores over the three timepoints, thus providing a statistical justification for the use of GCM. On average, there was a significant rate of decline in social anxiety scores over time, unstandardized coefficient = -1.54 , $t(34) = -4.29$, $p < .001$; thus, on average, social anxiety improved over time (regardless of condition) at a rate of 1.53 units per assessment. There was no significant random variability in the rates of change, $\chi^2(29) = 34.86$, $p = .209$.

To examine whether treatment condition was associated with rate of change in social anxiety over time, the following model was tested:

$$3.1.2.1. \text{Level-1 model. Social Anxiety} = \pi_{0i} + \pi_{1i} (\text{Time}) + e_{ti}$$

$$3.1.2.2. \text{Level-2 model. } \pi_{0i} = \theta_{00} + \theta_{01} * (\text{Condition}) + r_{0i} \\ \pi_{1i} = \theta_{10} + \theta_{11} * (\text{Condition}) + r_{1i}$$

Condition (1 = immediate treatment, 0 = wait-list control) was uncentered at Level 2. The primary parameter of interest (β_{11}) represents the degree to which change in social anxiety varies as a function of condition. The results are reported in [Table 3](#) and support our hypothesis that participants in the IT group experienced a greater rate of decline in social anxiety over time, relative to the WL group, $t(33) = -3.07, p = .004$. Notably, the simple slope for Time (i.e., rate of change in anxiety across repeated measures) was *not* significant for the WL group (β_{10}), $t(33) = -0.089, p = .376$. To compute the effect size, we computed pseudo $R^2 = .67$ (Kreft & De Leeuw, 1998; Singer, 1998) indicating this model explains 88% of the variance, a large effect.

3.1.3. Intervention acceptability

3.1.3.1. *Treatment credibility and expectancy.* Mean and standard deviations for the CEQ, CSQ-8, and WAI-Bond are shown in [Table 1](#). Given the negligible differences between the two time points and low internal consistency with the first CSQ-8, only the last time point will be discussed below. Scores on the CEQ-Credibility subscale indicated a high level of perceived credibility for ICBT with coach support ($M = 18.90, SD = 5.80$). As a comparison, a study examining the credibility and expectancy of a wide range of cognitive-behavioral treatments for a variety of presenting problems (Cohen et al., 2015) indicated a typical mean CEQ-Credibility score of 20.34 ($SD = 4.74$). For the present study, CEQ-Expectancy scores were also high ($M = 16.13, SD = 5.23$), and similar to typical expectancy scores ($M = 15.55; SD = 4.91$; Cohen et al., 2015).

3.1.3.2. *Treatment satisfaction and rapport with coaches.* The overall scores on the CSQ-8 were high ($M = 25.60, SD = 3.94$). In comparison, a recent, large study utilizing the CSQ-8 to examine predictors of client satisfaction (Kapp et al., 2017) reported a mean score of 25.20 ($SD = 5.60$). Scores on the WAI-SR-Bond indicated that participants felt positively about their relationship with their coach ($M = 15.78, SD = 1.90$). As a comparison, a large outpatient therapy sample report similar scores ($M = 16.00, SD = 3.12$; Munder et al., 2010).

3.1.3.3. *Fidelity.* The Coach Fidelity Checklist was completed immediately after meeting with each participant for 83 out of 102 (81.37%) opportunities. A research assistant trained to reliability with the first author rated 25% of the audio recordings of the coach-participant meetings.

Overall, coaches reported a high completion rate for many of the tasks on the checklist. Specifically, checking in (98.8%), reviewing material (100%) asking about problems that the participant may have had (96.4%), praising the participant for their hard work (84.3%), and planning for the next meeting (86.7%) were all completed at a high rate. However, coaches reported lower completion rates for praising for completion (33.7%) and engaging the participant in problem solving (33.7%). For both tasks, a high percentage (63.9%) reported that the task was “not applicable.” This is consistent with the independent ratings of audio recordings of the session for the problem-solving task, but not the “praising for completion” task.

Overall, 75.2% of the tasks, which were considered possible to complete were marked as “completed” by the independent rater. Four of the tasks were completed at least 90% of the time, including “check in with the participant” (90%), “review the material” (95%), “ask if participant had problems” (100%) and “plan for next meeting” (100%). The “problem solving” task was completed 100% of the time when applicable. However, the two tasks involving praise and compliments—“praise for completion” and “praise for hard work”—were completed only 30% and 35% of the time, respectively.

Further, the coaches rated their perceptions of the rapport they had with their participants, their own ability to engage the participants in conversation and their overall effectiveness in the coaching role. Their ratings of rapport were positive overall; 85.3% of the sessions were rated as “excellent” or “good,” while 14.7% were rated as “adequate” or “fair.” Coaches largely rated their own ability to engage the participants as “excellent” or “good” (82.6%) although 17.4% gave lower ratings of “adequate” and “fair.” Finally, coaches rated their own effectiveness as “excellent” or “good” for 84% of the sessions, and as “adequate” and “fair” for 16% of the sessions. No sessions were rated as “poor” on any of the three domains.

Table 1. Credibility expectancy questionnaire, client satisfaction questionnaire, and working alliance inventory mean by time

Measure	Time 2 <i>n</i> = 17	Time 3 <i>n</i> = 16
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
CEQ-Credibility	20.10 (2.95)	18.90 (5.80)
CEQ-Expectancy	16.98 (4.01)	16.13 (5.23)
CSQ-total	25.25 (2.49) ^a	25.60 (3.94)
Overall satisfaction	3.20 (.52) ^a	3.21 (.54)
Confidence in recommending to friends	3.12 (.78) ^a	3.28 (.46)
Helped deal with mental health concerns	3.15 (.37) ^a	3.17 (.51)
WAI-SR-Bond	15.70 (2.40)	15.78 (1.90)

^aCSQ-8 values at Time 2 should be interpreted with caution given low internal consistency.

Note: CEQ-Credibility and CEQ-Expectancy have a possible range of 3 to 27. CSQ-total has a possible range of 8 to 32. Individual CSQ items have a possible range of 1 to 4. WAI-Bond has a possible range of 4 to 16.

Table 2. Descriptive statistics for social interaction anxiety scale-6 by condition

	Immediate Treatment (<i>n</i> = 20)			Wait-List (<i>n</i> = 15)			Overall Sample (<i>N</i> = 35)		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Time 1	12.40	4.65	4–20	11.40	5.00	3–19	11.97	4.76	3–20
Time 2	10.12	4.29	3–21	11.23	4.51	3–18	10.60	4.35	3–21
Time 3	7.50	3.78	2–14	10.92	5.15	3–22	9.03	4.70	2–22

Table 3. GCA results: Condition predicts social anxiety trajectory

Social Anxiety as Outcome					
Fixed Effect	Coeff.	SE	t-ratio	df	p-value
Intercept π_0 β_{00}	11.35	1.24	9.19	33	<.001
Condition, β_{01}	0.98	1.56	0.63	33	0.533
Time slope, π_1 β_{10}	-0.45	0.50	-0.89	33	0.376
Condition, β_{11}	-1.96	0.63	-3.07	33	0.004

Note. Coeff. = unstandardized coefficients for all fixed parameters. The parameter of interest, representing the association between condition and social anxiety trajectory is bolded.

4. Discussion

The purpose of the present study was to investigate whether minimally trained peers could support engagement in a self-guided, internet-based treatment program for social anxiety. The efficacy of ICBT has been demonstrated in previous studies across several countries (e.g., Andrews et al., 2010) so this study replicated those studies in the United States. Given the literature of robust support for the efficacy of ICBT (e.g., Andrews et al., 2010), it is not surprising that the effect size for reduction in self-reported social anxiety in the immediate vs. wait list treatment condition was large and retention in the study was high. This adds to the growing support for the ICBT approach.

5. Acceptability of ICBT with coach support

One of the primary objectives of the present study was to examine whether individuals with social anxiety perceive ICBT with coach support as a viable treatment option. As hypothesized, credibility and expectancy scores were high and on par with previous studies of face-to-face treatments (Cohen et al., 2015). Furthermore, nearly all participants (95%) reported being satisfied with their experience, and all participants (100%) reported that they would feel confident recommending the treatment to a friend. These findings are consistent with other studies examining ICBT (Andrews et al., 2010; Johnston et al., 2011; Titov Andrews, Choi et al., 2008), as well as studies examining satisfaction with traditional, face-to-face cognitive-behavioral therapy (e.g., Kapp et al., 2017). Also, consistent with hypotheses, participants reported having a strong rapport with their coaches, similar to a large study of outpatient therapy clients in traditional settings (Munder et al., 2010).

It appears ICBT with coach support is an efficacious acceptable treatment alternative for college students with social anxiety. However, it may require additional steps to be taken to increase the uptake of coach support as demonstrated by all WL condition participants refusing coach support. Additional strategies to encourage participants to overcome their social anxiety and work with a coach may be needed. The results of this study are especially compelling given that the program was developed in Australia, yet it seems to be sufficiently cross-cultural to be acceptable to a broad swath of domestic and international students at a large U.S. university. All together, these findings are an important step in evaluating the potential of ICBT as a tool for enhancing accessibility of mental health care on campus where need, but not necessarily resources, are growing.

5.1. Feasibility of ICBT with coach support

The feasibility of incorporating peer coach support for ICBT was examined by comparing the resources required to implement this service to the benefits it produced, as well as collecting information from coaches about their experiences in the lay health worker role. The coaches in the present study had no formal training in providing mental healthcare services beyond the three-hour orientation and training and the manual described above. However, both the five coaches and independent rater agreed they completed most of the tasks outlined in the coach manual. One exception to this agreement was for praising participants. Coaches reported that they praised their participants for hard work 84% of the time, while the independent rater reported that they did so only 35% of the time. It is not possible to definitively resolve this discrepancy. However, it appears to be attributable to a lack of shared understanding of whether general positive comments constituted praise and coaches' apparent discomfort to offer specific positive reinforcement to peers.

The typical duration of participants' meetings with coaches was about 12 minutes (range 5–30 minutes), however, no strict requirement was set for these meetings, and coaches were instructed to meet as long as necessary to complete each task on the Coach Fidelity Checklist. According to the coaches, the efficiency of these meetings was due, in part, to both the user-friendliness of the ICBT program and high comfort and proficiency with online materials among university students. Given the strong rapport with coaches and good outcomes, it seems unlikely participants will cut the meetings short to avoid discussing concerns.

Peer coach support is demonstrably low-cost, but its specific contribution to treatment outcomes was more challenging to establish in the present study. However, there was some evidence that meeting with a peer coach encouraged participants to continue to engage with the ICBT program. For example, participants with immediate treatment conditions were required to work with a coach, while wait list participants were not. Interestingly, participants in the wait list condition opted out of working with a coach and completed only about one-third of the six modules on average. It is important to note that the wait list participants were no longer completing assessments nor receiving associated compensation, which may have contributed to their lack of usage of the treatment program as well. It is also unknown whether delayed treatment participants would have been more willing to meet with coaches if a teleconference

option was available for coaching sessions. In the present student, only face-to-face coaching was offered as the study was conducted prior to the global pandemic when teleconferencing became more commonly used.

5.2. Limitations

Although promising, the findings of the present study should be interpreted in light of the study's limitations. Understanding the role of coaches in positive outcomes is limited by the lack of an ICBT without a coaching control group. Given the substantial literature on the efficacy of ICBT alone (e.g., Andrews et al., 2010) and the importance of supportive check-ins to maintain engagement (e.g., Titov et al., 2008), the focus of this study was on using peers to support the internet-delivered service. This cost-effective model of care combines the efficacy of the intervention with the reduction in barriers to care that peer support, in particular, provides. Other limitations include coaches largely rating their own fidelity to the treatment, reliance on self-report measures of social anxiety, and a sample with lower social anxiety on average for a treatment seeking sample. Finally, participants were paid to complete the assessments, which likely contributed to high retention as intended, and may have biased self-report measures.

5.3. Clinical implications

This study adds to the growing support for ICBT as an innovative solution to improve access to care and alleviate the burden on mental health providers in university counseling centers (Xiao et al., 2017) and, potentially, in underserved areas. These results offer preliminary support for using minimally trained community peers to maximize engagement with online treatment. We know from previous research that having support is key for engagement in the treatment, but this study demonstrates that peer coaches can fulfill this role effectively. We envision that one mental health professional in a university counseling center could supervise a group of minimally trained peer coaches who meet directly with students pursuing ICBT as a first-line treatment in lieu of in-person professional services. In addition to creating an excellent educational experience for peer coaches, mental health providers can focus on clients who need a higher level of care.

International students responded to recruitment for this study at nearly double their representation at the university, suggesting ICBT may be an acceptable mode of intervention for them. International students are underserved by university counseling centers in much of the same way that rural individuals and racial and ethnic minorities have been underserved by mental healthcare in the broader community (Hwang et al., 2014). Further, both the quantity and quality of friendships with American classmates have been shown to predict college adjustment among international students (Hirai et al., 2015). This may suggest that ICBT with coach support from an American peer such as was done in this study is especially well suited for international students. Unfortunately, the sample sizes of $N = 4$ international students in IT and $N = 2$ in WL that preclude separate analyses for this subgroup.

5.4. Future research and conclusion

This study adds to a substantial body of the literature on the efficacy of ICBT for social anxiety and other common presenting problems. Combining internet-based treatments with peer support could extend the reach of mental health services on campus. Whether this model can be extended to non-campus community settings is less clear as it may be particularly appropriate for emerging adults on campus. Considering their age and education, college students may be more willing and able to engage with a technology-based treatment modality compared to older individuals (Czaja & Sharit, 2016) so future research is needed on extending the care model to underserved communities. Research deploying this model through university counseling centers and in community settings is the next step to identify best practices and test effectiveness.

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Note

1. Although the study utilized many aspects of a randomized controlled trial (RCT), other aspects of an RCT such as registration of the trial and availability of data, were not done. This decision was made due to the pilot nature of the study, the study serving as the first author's dissertation and not obtaining informed consent to publish the data.

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No potential conflict of interest was reported by the author(s).

Data Availability

The full dataset is not available for this study. Contact the first (CLB) or last author (DAH) for access to specific variables.

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