


Article

Internet-Based Cognitive Behavior Therapy for Stress and Anxiety among Young Japanese Adults: A Preliminary Study

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Abstract: In the present study, we examined the effect of an internet cognitive behavior therapy (ICBT) program on anxiety, stress, and depressive symptoms in university students. Data were analyzed for 17 participants undergoing ICBT and 11 control group participants. An ANOVA of intention-to-treat analysis and per protocol (PP) analysis indicated that the interaction between group and measurement time was significant for the state–trait anxiety inventory (STAI) scores and that idiosyncratic anxiety was significantly improved. Through the results of PP, a moderate effect size for changes in STAI scores in the intervention group was observed ($d = 0.62$) based on Cohen’s (1988) classifications. A large effect was also observed for improvements in idiosyncratic anxiety ($d = 0.91$). Based on the results of the analyses, a significant interaction was observed for the STAI scores. In the intervention group, STAI scores and individual anxiety were significantly reduced after implementing the ICBT program. It was suggested that the ICBT program may positively influence thinking about anxiety and stress from an objective viewpoint.

Keywords: internet; cognitive behavior therapy; anxiety; stress

1. Introduction

Cognitive behavior therapy (CBT) has been demonstrated to be effective in the reduction of multiple symptoms of anxiety, and meta-analyses have revealed that CBT may reduce the symptoms of various anxiety disorders [1]. Treatments utilizing the CBT technique for the treatment of generalized anxiety disorder, panic disorder, obsessive–compulsive disorder, and social anxiety disorder have demonstrated that anxiety symptoms can be significantly reduced [2,3]. A combination of CBT and pharmacotherapy enhances the reduction of depressive and anxiety symptoms more so than treatment utilizing pharmacotherapy alone [4].

In Japan, it has been noted that CBT is effective for symptoms of stress. By implementing a program centered on CBT for Japanese adults experiencing stress, participants actively attempted to deal with difficulties contributing to stress in comparison to pre-implementation where this was not the case [5]. It has further been reported that stress responses were reduced in Japanese participants, making these studies relevant to the Japanese context [5]. However, it is difficult for individuals to receive these types of treatments because the number of therapists implementing CBT in Japan is limited [6]. In this regard, it has been suggested that if CBT is implemented in the form of individual psychotherapy, both the therapist and the patient will incur significantly lower economic and time

costs [7]. In Japan, depression patients' first visit seeking primary care appears to be for internal medicine (64.7%), treatment, and psychiatry (5.6%) interventions [8]. These values for Japanese patients are relatively low, and a factor impeding the commencement of treatment is that the majority of individuals may experience resistance to psychological and psychiatric treatment for mental health.

Recently, attempts have been made to provide CBT through the internet to facilitate implementation at a lower cost to a greater number of patients. Internet CBT (ICBT) programs are delivered using on-demand interfaces and other electronic media. ICBT is a self-help CBT technique, and such technology-based CBT techniques can be delivered either with or without the support of a trained clinician. Therefore, ICBT programs promote the effective delivery of evidence-based treatments over the internet since technologies such as computers, tablets, or smartphones are used to access materials and programs. As a result, self-help CBT provides a useful approach for the advancement of treatment of psychological problems. The findings of previous meta-analyses indicate that computer-based psychological treatments for depression [9] and anxiety disorders [10] are effective. Therefore, there is some evidence that ICBT techniques can overcome barriers to care, such as the limited availability of clinicians trained in evidence-based interventions [11]. One advantage of the ICBT service and approach is that the costs to both users and providers can be reduced when compared to face-to-face treatment and assistance; therefore, treatments can be immediately implemented, removing the restrictions of time and place, with patients who could not necessarily have been provided with conventional assistance [12].

Previous studies have shown that self-help ICBT programs may have a moderate effect on depressive and anxiety symptoms [13–15]. Additionally, self-help treatments such as ICBT can also address barriers to care, including the limited availability of clinicians trained in evidence-based interventions [16]. Challenges in treatment, such as the limited availability of clinicians trained in evidence-based interventions, may also be alleviated through the use of self-help ICBT protocols. It has been reported that ICBT is effective in assisting patients who are reluctant to attend treatments in clinical settings due to fears of stigmatization [17]. It is implied that self-help ICBT can be deemed effective for adults accessing primary care services for treatment of anxiety and depression [18]. Meta-analyses also suggest that self-help CBT, a similar protocol to ICBT, can be effective in the treatment of psychological difficulties of low to moderate severity [19,20]. A meta-analysis study reported that computerized CBT has potential for treating and preventing anxiety and depression in clinical and general populations of young people [21]. Another meta-analysis was conducted on anxiety and other psychological problems for university students and suggested that in comparison to the inactive control, sensitivity meta-analyses supported intervention in improving anxiety [22]. However, in comparison to active controls, sensitivity analyses did not support either condition for anxiety.

ICBT research demonstrates that diagnostic, cross-sectional ICBT was developed with reference to disease-specific CBT using conventional Internet protocols [23]. The diagnostic crosscut of ICBT was a program designed to allow the patient to master CBT skills within six to eight sessions. When transdiagnostic ICBT was performed on patients who had been diagnosed with one or more anxiety disorders (generalized anxiety disorder, panic disorder, social anxiety disorder), the ICBT implementation group experienced more effective alleviation of symptoms than the treatment-waiting group. It has also been reported that specific symptoms of anxiety were significantly reduced after ICBT treatment. Another study indicated that therapist-assisted ICBT, when offered in clinical practice, significantly reduced depression, anxiety, stress, and impairment and improved quality of life [24]. Therefore, if it is possible to develop ICBT for people with multiple disorders, the possibility of application to cases of comorbid mental disease will expand. Regarding the ICBT focusing on the comorbidity of multiple diseases and symptoms, sufficient effect studies have not yet been conducted in Japan [25].

In the present study, we examined the effect of an ICBT program for university students and revealed its influence on changes in states related to anxiety, stress, and depression. By implementing

the ICBT program for young adults, it is possible to intervene during the early stages of presentation of psychological states and initiate preventative measures.

2. Experimental Design

2.1. Participants

This study was a nonrandomized clinical trial. We recruited participants from a population of Japanese university students through a recruitment announcement. The participants were healthy volunteers and provided informed consent. Initially, 42 individuals responded to the request to participate and were allocated to the intervention group or the control group. Individuals who were diagnosed with mental disorders, frequently attended hospitals for mental-disorder-related symptoms or had received any type of psychotherapy were excluded. Additionally, those who had scores of 60 points or higher on the self-rating depression scale (SDS) [26] were excluded because it has been suggested that scores of more than 60 points indicate moderate or higher levels of depression symptoms [27]. In this study, although the program was implemented once per week, it was decided that the implementation criteria were not met when the implementation could not be confirmed for two or more weeks even after an e-mail reminder was provided.

After the informed consent session, in which written consent forms were obtained from all participants, a total of 18 participants in the ICBT group and 11 participants in the control group completed each task. We later excluded from the data analyses one participant who had dropped out of the study and six participants who did not comply with the implementation standards from the analysis in the ICBT group, resulting in a dropout rate of 5.56% for the intervention group. Therefore, 17 participants (94.44%) completed the program and 11 participants (61.11%) completed and complied with the standard requirement of conducting sessions every week.

To perform intention-to-treat (ITT) analysis, we analyzed the data of 17 participants in the ICBT group (average age of 19.82 years, $SD = 0.95$; 4 males, 13 females) who did not meet the implementation criteria but completed the ICBT program to the end, as well as 11 participants in the control group (average age of 19.36 years, $SD = 0.50$; 2 males, 9 females). Additionally, to conduct per protocol analysis, we analyzed data from 11 participants in the ICBT intervention group who complied with the implementation standards (average age of 19.82 years, $SD = 1.08$; 2 males, 9 females) and 11 participants in the control group.

2.2. Measures

2.2.1. The Japanese Version of the State-Trait Anxiety Inventory (STAI)

In this study, we used the STAI Japanese version of characteristic anxiety items as a measure to assess the changes in anxiety as a long-term personality trait [28]. Trait-anxiety items consisted of 20 items, and scores ranged between 1 and 4 points per item, or 4 and 1 points for reversed items. The total score was then calculated. The possible total score range was between 20 and 80 points. Higher scores indicated higher characteristic anxiety. In this study, Cronbach's α coefficient was 0.85 [28].

2.2.2. Psychological Stress Response Scale (SRS-18)

The SRS-18 was used as a measure of psychological stress responses. The SRS-18 [29] is composed of 18 items based on three subscales, namely, "depression/anxiety", "bad mood and anger", and "lethargy". This instrument allows measurement of psychological stress reactions that individual's experience. The responses are recorded on a 4-point system, giving a score of between 0 and 3 points per item, and a total score range between 0 and 54 points can be calculated. Each factor of SRS-18 showed a Cronbach's alpha coefficient higher than 0.82.

2.2.3. Japanese Version of the Self-Rating Depression Scale (SDS)

The SDS [26] was used as a measure of the degree of depression. The SDS is composed of 20 items measured on a 4-point scale, with a total score ranging from 20 to 80 points. Higher scores indicate more extensive depression symptoms. The high reliability and validity of the scale has been confirmed [26]. In the present study, individuals with a score of 60 or higher, indicating a moderate or higher level of depression symptoms, were excluded from participation because it has been suggested that scores of more than 60 points indicate moderate or higher levels of depression symptoms [27]. It has also been reported that the test–retest reliability of the SDS was 0.853 [26].

2.2.4. Japanese Version of the Liebowitz Social Anxiety Scale (LSAS)

The LSAS [30] is a measure of the degree of fear and anxiety and the extent of avoidance of social situations. The scale consists of 24 items relating to fear and anxiety and 24 items relating to avoidance of social situations. The responses regarding fear sense or sense of uneasiness are measured on a 4-point scale. An item score of 0 to 3 points was given to each item, and a total score was calculated. The possible score range was 0 to 72 points for fear and anxiety, 0 to 72 points for avoidance, and 0 to 144 points for the full score range. High reliability and validity scores have been reported for the LSAS [30]. The total score for LSAS showed a Cronbach's α coefficient as 0.95.

2.2.5. Japanese Irrational Belief Test-20 (JIBT-20)

To measure the extent of the negative belief characteristic of depression, the JIBT-20 [31] was used. The JIBT-20 is a measure of irrational beliefs ("Irrational Belief"). Unreasonable, or irrational, beliefs are one of the core concepts in logic therapy as advocated by Ellis, based on the theoretical cognitive appraisal of absolute thoughts such as "must be" and "is natural".

The scale consists of five factors: self-expectation, dependence on others, problem avoidance, ethical accusation, and helplessness. The scale consists of 20 items assessed on a grading score of 1 to 5 points per item. The total score ranges from 20 to 100 points. Cronbach's alpha coefficient of each factor was 65–89.

2.2.6. Subjective Units of Distress for anxiety (SUD)

The SUD scale was used to measure self-ratings of anxiety. A scale range of 0 to 100 was used for individualized anxiety or stress situations. Participants in the ICBT group rated and recorded their subjective levels of distress or anxiety during the ICBT program. For the present study, we compared the SUD rating in the first session with the value recorded in the eighth session. SUD-1 indicates what the participant feels most uneasy about in the anxiety hierarchy table. SUD-2 shows the second-most uneasy situation, and SUD-3 shows which situation the participants rank as third-most uneasy.

2.3. Components of the ICBT Program

The ICBT group participants underwent sessions conducted eight times on a weekly basis using tasks in a web-based self-help program. This program was completely devoid of interpersonal therapeutic contact or support and was delivered using an on-demand e-learning system. The contents of the program are shown in Table 1. The eight total sessions of the ICBT program represent a combination of tasks relating to stress management, cognitive behavioral therapy, and psychological education. Participants underwent each session alone.

During the first four sessions, participants advanced their understanding of stress models and the acquisition of stress coping mechanisms. In the latter four sessions, participants aimed to achieve a cognitive restructuring and implementing objective, rather than irrational, thinking styles. The program used in this research is designed in the user-friendly form of a conversation between characters created specifically for the ICBT intervention, as shown in Figure 1.

The control group did not undergo ICBT. Control participants answered the set of questionnaires at around 8 weeks, which is the same as the implementation period of the ICBT program, to compare psychological states between the control group and the ICBT group. The control group was able to receive the ICBT program, used in this study if requested, after answering the set of questionnaires at post-period. However, none requested implementation, and as a result, no participant received the program at the control group.

Table 1. Contents of the eight internet cognitive behavior therapy (ICBT) program sessions.

Contents		Details
No. 1	Psychoeducation for stress model	Understanding stress model and organization of the situations where participants feel anxious or stressed
No. 2	Stress management	Understanding what kind of psychological state participants are in when they feel stressed
No. 3	Stress coping	Participants consider the feasible stress coping measures
No. 4	Social support	Clarifying social support resources in participants' daily lives
No. 5	Psychoeducation for anxiety	Understanding the participants' cognitive behavioral characteristics in situations where they feel anxious
No. 6	Cognitive restructuring	Participants grasp their negative cognition
No. 7	Cognitive restructuring	Examine ways to shift one's negative cognition to objective cognition
No. 8	Summary	Participants reflect on past efforts



Figure 1. Example slide from the ICBT program.

2.4. Ethical Policy

Prior to the study, participants were informed that participation was voluntary. Only participants providing informed consent were included in the study. Participants were informed that withdrawing participation from the study was possible at any time prior to the publication of results. In order for the participants in the intervention group to use the web-based system, the ICBT program was distributed using a preset ID and password. This information was kept strictly confidential by the research staff. In cases of development of poor physical or mental conditions during the research process or in cases of seeking consultation at a medical institution, researchers informed the associated clinical psychologist. In this study, there were no adverse events. This study was carried out with the approval of the Research Committee of the Musashino University (Number: 27019).

2.5. Statistical Analyses

We performed both ITT and per protocol analyses. First, *t*-tests were conducted to examine whether there was a significant difference in each value at the pre-intervention period. We also conducted an analysis of variance (ANOVA) to reveal group differences for all measures. In order to clarify the changes in SUD scores, paired *t*-tests matching pre-intervention and post-intervention scores were conducted for the ICBT group. We then calculated the effect sizes (Cohen's *d*) to assess the degree of change when significant differences were present in the analysis of variance calculations. According to the accepted standard [32], the effect size classifications were set to small = 0.2, medium = 0.5, and large = 0.8. The statistical software SPSS version 24 was used for all analyses.

3. Results

When ITT was performed, the results of *t*-tests showed that there was no significant difference on each value at the pre-intervention period (STAI: $t(26) = 0.03$, $p = 0.99$; SRS-18: $t(26) = 0.54$, $p = 0.58$; SDS: $t(26) = 0.18$, $p = 0.85$; JIBT: $t(26) = 1.60$, $p = 0.12$; LSAS-J: $t(26) = 0.29$, $p = 0.77$). Therefore, although ANCOVA was not performed, ANOVA was used. In terms of the inferential results, the ANOVA revealed that the interaction between the groups and the measurement times was significant for the STAI score ($F(1,26) = 9.38$, $p < 0.01$). However, there was no significant interaction in the scores for the SRS-18 ($F(1,26) = 0.35$, $p = 0.55$), SDS ($F(1,26) = 1.05$, $p = 0.31$), LSAS ($F(1,26) = 0.04$, $p = 0.95$), and JIBT-20 ($F(1, 26) = 0.44$, $p = 0.51$).

When per protocol analysis was performed, the results of *t*-tests showed that there was no significant difference in each value at the pre-intervention period (STAI: $t(20) = 0.41$, $p = 0.68$; SRS-18: $t(20) = 0.38$, $p = 0.70$; SDS: $t(20) = 0.43$, $p = 0.66$; JIBT: $t(20) = 1.26$, $p = 0.22$; LSAS-J: $t(20) = 0.22$, $p = 0.82$). Therefore, although ANCOVA was not performed, ANOVA was used. In terms of the inferential results, the ANOVA revealed that the interaction between the groups and the measurement times was significant for the STAI score ($F(1,20) = 7.66$, $p < 0.05$; Table 2). However, there was no significant interaction in the scores for the SRS-18 ($F(1,20) = 0.07$, n.s.), SDS ($F(1,20) = 0.65$, n.s.), LSAS ($F(1,20) = 0.02$, n.s.), and JIBT-20 ($F(1, 20) = 1.71$, n.s.). The results of the descriptive statistics are shown in Table 2. The tendency of these results was similar in ITT and per protocol analysis, and both showed significant interaction only in the STAI. Therefore, the subsequent analysis will show per protocol analysis, which is a more rigorous analysis.

For the STAI, a post hoc Bonferroni adjustment was calculated. For the intervention group, the STAI score was significantly reduced between the pre-intervention and post-intervention periods ($p < 0.05$), as shown in Figure 2. For the control group, there was no significant difference between the pre-intervention and post-intervention periods. There was no significant difference between the intervention group and the control group for each of the periods. Moderate effect sizes were observed for the intervention group ($d = 0.62$). For the control group, the effect size was small ($d = -0.07$).

In order to examine the effects of the ICBT program in detail, we analyzed the numerical values of the SUD. Paired *t*-tests were conducted, for which the intervention group's first session numerical values on the SUD of the anxiety hierarchy table were paired with the SUD values entered at the eighth session. Effect sizes were also calculated. These results are shown in Table 3. For SUD-1, the mean values after treatment were significantly reduced compared to the average values prior to treatment ($t(10) = 4.20$, $p < 0.01$). The SUD values indicating the degree of anxiety decreased significantly from the first program session to the eighth program session. Calculations showed that the SUD-comparisons effect size was large ($d = 0.91$).

4. Discussion

The purpose of this study was to investigate how the psychological states of anxiety, depression, and stress are altered after implementing an ICBT program for Japanese university students. The analysis demonstrated that there was a significant interaction in the STAI score when comparing the intervention

and control groups. For the intervention group, the STAI score was significantly reduced after attending the ICBT program. The calculated effect sizes indicated a moderate effect on the STAI for the intervention group. Although there was no difference in anxiety reduction between the intervention group and the control group, anxiety was reduced when the ICBT program was undergone, and there was a moderate effect size for the state of anxiety. The SUD of the ICBT intervention group was significantly decreased, coupled with a large effect size. Therefore, it is indicated that the present ICBT program might be effective in reducing the anxiety of the participants.

Table 2. Pre- and post-assessment data for each instrument ANOVA results.

Scales	Groups	Pre	Post	F-Values		
		Mean (SD)	Mean (SD)	Main Effect		Interaction
				Time	Group	
STAI (trait)	CCBT Group	50.55 (7.70)	45.64 (8.16)	4.55 *	0.14	7.66 *
	Control Group	49.09 (8.56)	49.73 (9.37)			
SRS-18	CCBT Group	17.64 (9.79)	15.55 (8.61)	3.35	0.12	0.07
	Control Group	19.27 (10.17)	16.45 (7.43)			
SDS	CCBT Group	45.27 (7.43)	43.00 (7.99)	1.47	0.03	0.65
	Control Group	43.82 (8.10)	43.36 (7.94)			
JIBT	CCBT Group	64.91 (8.32)	60.00 (8.97)	5.83	3.16	1.72
	Control Group	69.09 (7.19)	67.64 (8.94)			
LSAS-J	CCBT Group	58.00 (20.35)	58.45 (27.04)	0.08	0.04	0.02
	Control Group	55.55 (29.54)	56.82 (25.28)			

* $p < 0.05$.

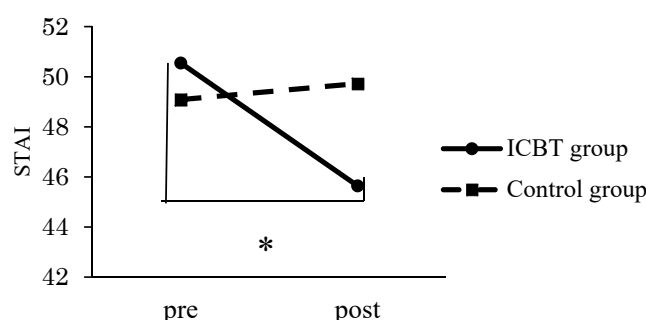


Figure 2. The state–trait anxiety inventory (STAI) scores change.

Table 3. The change scores of the subjective units of distress for anxiety (SUD) and effect sizes for the ICBT program.

SUD	Pre		Post		t-Values	Cohen's <i>d</i>
	Mean	SD	Mean	SD		
SUD1	95.88	8.70	84.41	15.64	4.20 **	0.91
SUD2	80.29	14.52	65.00	21.14	3.77 **	0.84
SUD3	69.12	19.14	62.47	19.09	3.40 **	0.35

** $p < 0.01$.

Several factors related to the implementation of ICBT indicate that state anxiety and anxiety relating to individual circumstances were both significantly reduced. First, after requesting that participants describe situations in which they feel uneasy and stressed (presented as SUD scores), participants now specifically recognized the situation and its effects, leading to a reduction in anxiety. These situations relating to the individual's anxiety included presentations in front of large groups, conversations with new people, and conversations with superiors. Many contents of the presented

scenes were classified as resulting in uneasiness. In other words, regarding the scenes experienced by the participants, there were multiple symptoms experienced which related to anxiety. Other studies have shown that self-help CBT is a change of anxiety. As in this study, a method for advancing self-view was included [15]. This suggests that the CBT technique through an internet module is likely to improve anxiety. Therefore, it is thought that the state of anxiety in such situations was primarily improved by implementing the eight programs of the ICBT intervention.

As a result, the scores of STAI and SUD used to measure anxiety were reduced. It is possible that the influence of thinking about anxiety and stress from an objective viewpoint may have been influenced by the cognitive reconstruction method used in the ICBT program. Completing the program may have been effective for participants to understand themselves objectively and observe themselves in a meta-perceptual manner. In the ICBT program, a method of thinking from other viewpoints was adopted, such as writing letters about the anxiety and stress of the ICBT implementer himself/herself and considering advisement on the cognition and behavior caused by the anxiety and stress as if in a friend's situation. The participants were encouraged to think about their individual anxiety-provoking situations realistically and from an objective point of view. As a result, anxiety was reduced due to cognition being modified into an adaptive process. A previous study suggested that good writing skills are considered necessary to provide effective ICBT [33]. In this study, it is possible for the participants to write their own thoughts briefly and promote change, which could be effective in reducing anxiety.

However, there were no significant reductions in other values. In this study, we introduced the contents of an ICBT program designed to promote psychological education regarding stress and an understanding of coping mechanisms. However, no significant reduction in stress responses was observed. This may be due to the fact that the content of the stress management component was centered on emotional-focus methods of coping. It has been reported that stress control and subjective responses interact to affect higher-level cognitive abilities [34]. Specifically, exposure to moderate, controllable stress benefits performance. Therefore, if the participants feel that it is possible to control the situation leading to stress and anxiety produced in the ICBT program, it is possible that the stress value may be reduced by the problem-solving countermeasure. In this way, it can be hypothesized that the stress values were not significantly reduced because the problem-solving responses used in this study did not match the stressful situation experienced in the ICBT intervention.

A previous study suggested that transdiagnostic ICBT may be effective, but an anxiety program may not be as efficacious as disorder-specific ICBT programs [23]. It was reported that significant differences at post-treatment between treatment and control group participants were found only for participants with a primary diagnosis of the symptoms of panic disorder. It is also suggested that the same tendency as observed in previous research was recognized when targeting Japanese young individuals.

The ICBT program used in this study had a dropout rate of 5.56% overall, if the strict criteria for program implementation are not adopted. This demonstrates that the time-burden is small and that the CCBT program is relatively easy to implement for healthy groups of subjects under a threshold indicating mental disorders.

The completion rate that met the strict criteria for program implementation was 61.1%. It was reported in the meta-analysis that in the guided ICBT, the completion rate was 65.1% (55.3–73.8%) and the 80%-completion rate was 67.5% (56.8–76.6%) [35]. The present study was a complete self-help program without therapist's guide; however, almost the same completion rate was observed. It is suggested that this study has a relatively high degree of program completion. This seems to be less burdensome for participants to carry out using illustrations like comics to this program, and it may have been easier to continue regardless of being a guided ICBT. In the future, to expand the applicability of the CCBT program, it is necessary to examine whether there is an intervention effect on subjects with diagnosed mental disorders as well as for healthy groups and anxiety disorder patients. A previous study also indicated that treatment dropout is probably better predicted by a lack of engagement in terms of a decrease in treatment pace and activity rather than by an increase in

distress [36]. The relatively low dropout rate, as compared to the previous study, suggests that the program used in this study was easy to implement and not burdensome for participants. On the other hand, if implemented as a guided ICBT, this program may be more effective. As pointed out in the review, in general, the effect of improvement is higher in the guided ICBT. While there is an advantage to it being self-help, it is thought that there is room to improve the effect of present program.

Finally, this study had several limitations and thus introduces numerous directions for future research. First, the number of subjects studied was small for both the intervention group and the control group, reducing the statistical reliability of the results. Therefore, this study is considered to be preliminary. In order to study the effect of the ICBT program in more detail, it is necessary to increase the number of subjects in each group and to conduct studies at multiple universities and undergraduate departments in order to extend the applicability of the findings. It is potentially necessary to consider not only college students but also a wider range of individuals to increase the generalizability of the findings. On the other hand, when $G^*Power 3$ was used to perform complementary post-hoc power analysis, a certain power ($1-\beta$) to protect against type II error was shown for STAI and SUD in per protocol analysis where significant differences were recognized (STAI: 0.99, $\alpha = 0.05$; SUD: 0.96, $\alpha = 0.05$) [37,38]. Although it is necessary to increase the number of subjects in the future, it is thought that this research has certain reliability.

In this study, all evaluation indices were calculated based on participants' self-evaluations. In order to diversely evaluate the effectiveness of the ICBT program, it is necessary to add indices based on evaluations by others in addition to the self-evaluation-based indicators. In this way, the effect of the ICBT program can be examined in more detail by including structured interviews as well as evaluations using additional psychological questionnaires.

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