



# Acceptance and Commitment Therapy on Students' Perceived Stress and Test Anxiety

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Received: 24 June, 2024; Revised: 17 March, 2025; Accepted: 30 May, 2025

## Abstract

**Background:** Test anxiety has an adverse effect on academic performance and can degrade the psychological well-being of students. Among others, acceptance and commitment therapy (ACT) has been proven to alleviate test anxiety in young students.

**Objectives:** The present research aimed to design, implement, and assess an education program based on ACT on perceived levels of stress and test anxiety among students of the University of Rehabilitation Sciences and Social Health in 2021.

**Methods:** The study employed a semi-experimental design, including pre-test and post-test evaluations. The study population included all undergraduate students of the University of Rehabilitation Sciences and Social Health in the second semester of 2022 - 2023. Of this population, 103 individuals were selected for the study through the accessible sampling technique, adhering to the specified criteria for inclusion and exclusion. Also, 8 ACT sessions were held for the participants voluntarily. The required data were collected by asking the subjects to complete Sarason's test Anxiety Questionnaire and Cohen's Perceived Stress Questionnaire in two phases: (1) Pre-test, and (2) post-test. The data underwent analysis with the paired *t*-test using SPSS V28 statistical software.

**Results:** The findings of this study reveal that the sample consisted predominantly of female students (87.4%), with most being single (90.3%) and in their first semester (81.6%). The average age of participants was  $21.73 \pm 3.14$  years, and the mean GPA was  $17.13 \pm 0.90$ . A paired *t*-test was utilized to assess the impact of a commitment-based training program on perceived stress and test anxiety. The results showed a significant reduction in average test anxiety (from 19.82 to 16.95) and perceived stress (from 27.79 to 25.18) post-intervention, indicating the program's effectiveness. Effect sizes of 0.62 for test anxiety and 0.57 for perceived stress suggest a moderate impact of the intervention on these outcomes.

**Conclusions:** Considering the efficacy of the current intervention on test anxiety and perceived stress among students, it can be implemented for Iranian students.

**Keywords:** Acceptance and Commitment Therapy, Perceived Stress Scale, Students, Test Anxiety

## 1. Background

Some young adults experience entering university at the end of adolescence. Although entering the university is a fantastic experience, the students may face new challenges in the university environment that can cause some psychological issues (1). The level of distress imposed on students during their study period causes a wide range of psychological issues, including experiencing high levels of stress and anxiety. There are

numerous predisposing factors for anxiety in young students. Moreover, they may face "test anxiety", as a factor with an important role in the onset of anxiety-associated issues in young students. Overall, almost all young students are exposed to this type of anxiety (2, 3). Test anxiety encompasses a range of experiential, behavioral, and physiological reactions that occur alongside potential negative outcomes or performance difficulties during the actual examination or similar circumstances (4, 5). Test anxiety has a negative impact

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**How to Cite:** Rezaei O, Nazeri Astaneh A, Ebrahimi A, Jenabi Ghods M, Yahyavi S T, et al. Acceptance and Commitment Therapy on Students' Perceived Stress and Test Anxiety. Iran J Psychiatry Behav Sci. 2025; 19 (3): e147864. <https://doi.org/10.5812/ijpbs-147864>.

on studying, in general, and information retrieval during the test, specifically, causing students not to be able to demonstrate their abilities and eventually not to perform well on the test. According to previous studies, the negative impact of test anxiety on students' academic status and their academic competency was significant (6, 7). Hence, students' academic performance can be enhanced by acknowledging exam anxiety and assigning some strategies to alleviate it (8). Various methods have been suggested to improve students' performance and reduction of test anxiety and stress experienced by them. Among these, we can refer to relaxation, cognitive behavioral therapy, teaching self-control techniques, etc. Acceptance and commitment therapy (ACT) is a novel cognitive-behavioral method to help individuals obtain a more valuable and satiating life through elevating psychological flexibility. The objective of this method is realized by improving the ability to deal with experiences in the present time and to choose an action from suggested adequate options, rather than an action simply to avoid disturbance of feelings, thoughts, desires, or memories (9, 10). In their meta-analysis, Xu et al. proved the efficacy of using ACT for improving university students' psychological well-being (11). Livheim et al. showed the significant impact of ACT on reducing stress, and anxiety and improving self-awareness skills. They acknowledged that this method holds promise as an effective intervention to enhance the mental well-being of school-going adolescents (12). Morin et al. used self-help books to compare the efficacy of ACT and mindfulness-based stress reduction (MBSR) in university students. Both approaches proved to have medium to large effects on psychological flexibility, mindfulness, cognitive fusion, psychological distress, positive mental health, and academic distress. They showed that both approaches effectively improved students' mental health (13). Viskovich and Pakenham conducted a web-based (4-week) ACT to improve mental health among college students. They found considerable improvement in students' mental health who were assigned to the treatment group (in comparison with their waitlist control) (14). Xu et al. investigated the effectiveness of ACT on stress and coping mechanisms of international students studying in China. The results indicated that group therapy with the approach of teaching ACT - compared to the pre-test obtained from the participants - caused a considerable decline in anxiety, stress, and depression levels in the post-test. According to these researchers, the results were maintained for one month after the intervention (11). In contrast, Morin et al. showed that the process of commitment and behavioral changes lowered

symptoms of depression, stress, and anxiety indirectly through its effect on the process of acceptance, mindfulness, and psychological flexibility. However, it did not reduce depression, anxiety, and stress levels in students (13).

## 2. Objectives

The aim of this study is to examine the impact of ACT on reducing perceived stress and test anxiety among students.

## 3. Methods

### 3.1. Participants

This semi-experimental research has a pre-test-post-test design. The research population included all undergraduate students of the University of Rehabilitation Sciences and Social Welfare in the second semesters of 2022 and 2023 (N = 700). The inclusion criteria were undergraduate students who had obtained average to high scores in one of the two questionnaires of Cohen's Perceived Stress and Sarason's test anxiety and did not suffer from mental illness. On the other hand, the exclusion criteria were suffering from physical or mental illness during the course, acute stress during the duration of the course, and the absence of more than one session in intervention sessions. The national system approved the project of innovative educational activities of the ministry of health with the code P220300. After its approval, from the second semester of 2022 to the end of the second semester of 2023, an announcement for participating in the intervention was put on the university website and in educational groups and student dormitories. Students applying for the intervention contacted the course instructor to get the course information. Subsequently, they were provided with the questionnaire link via the press release. After completing Cohen's Perceived Stress and Sarason's Test Anxiety Questionnaires and obtaining average to high scores in at least one of these two questionnaires (perceived stress score higher than 21 and exam anxiety score higher than 12), 103 students were finally included in the study using available sampling. In the first stage, the intervention was designed based on ACT according to the model of Hayes et al. (15) as the intended intervention (Table 1). At the beginning of the implementation process, a consent form, including an explanation of ethical issues and the details of the meetings, was provided to the participants. After accepting the mentioned conditions and declaring full readiness for cooperation, the students were placed in groups of 8-10. The students

**Table 1.** Content of Training Sessions in Acceptance and Commitment Therapy for Students

Sessions	Content
1	Establishing a therapeutic relationship, concluding a therapeutic contract, psychological training
2	Engaging in discussions about experiences and evaluating them, considering efficiency as a metric, and encountering creative challenges
3	Identifying control as an issue, presenting desire as an alternative reaction, and participating in intentional behaviors
4	Applying cognitive deconstruction methods to disrupt dysfunctional thought patterns, diminishing attachment to thoughts and emotions
5	Considering oneself as a contextual observer, challenging self-identity and self-expression, delineating a distinction between oneself, internal experiences, and actions
6	Using mental strategies, practicing disengagement from thoughts, and training to perceive internal experiences as dynamic processes
7	Introducing values, illustrating the risks of fixating on outcomes, exploring the pragmatic significance of life experiences
8	Grasping the essence of aspiration and dedication, establishing behavioral routines aligned with personal values

were allocated into different groups based on their desired day hours. It was a purposeful sampling. Based on the reviewed studies and the proposed plan of sessions in the Hayes et al. model (15), the intervention implementation was held in the form of 8 sessions of 1.5 hours weekly. The provided program was held in the form of lectures, questions, and answers, along with the distribution of training booklets on emotion regulation and assigned homework. The intervention outcomes were evaluated based on Kirkpatrick's model and in the form of learning (16). Thus, after the training, the perceived stress and test anxiety questionnaires were checked and compared with the pre-test phase. The sessions were led by a qualified psychologist with a doctoral degree.

### 3.2. Research Tools

#### 3.2.1. Demographic Information Battery

Demographic information was gathered using a questionnaire, including information concerning gender, marital status, academic semester, grade point average, official employment, history of specific physical illness, regular use of psychiatric medication, and residence status (e.g., dormitory).

#### 3.2.2. Sarason Test Anxiety Questionnaire

Sarason's test anxiety was developed in 1957 with 37 questions and "yes" or "no" two-choice items. Test scores correspond to test anxiety levels. Scores at or below 12 suggest mild anxiety, and those ranging from 13 to 20 indicate moderate anxiety. Those scoring 21 or higher are considered to have severe test anxiety (17). In this respect, Farnia et al. investigated the reliability of the Persian version of the questionnaire. They noted that the internal consistency, evaluated through Cronbach's alpha coefficient of 0.84, demonstrated satisfactory reliability (18).

#### 3.2.3. Cohen's Perceived Stress Scale

In this research, stress was assessed using a questionnaire by Cohen et al. This 14-item survey evaluated general stress levels experienced in the past month, along with participants' thoughts and feelings about stressful situations, and their coping strategies for managing and overcoming stress (19). Scores on this questionnaire are from 0 (no stress) to 56 (high stress), with higher scores indicating greater perceived stress in the past month. Various studies have examined the reliability of this scale by using Cronbach's alpha coefficient and retesting. Cohen et al. presented Cronbach's alpha coefficient of version 14 as 0.75 on a sample of 2,387 people in America (20). Empirical studies have confirmed the validity of the Perceived Stress Scale (PSS-14) for measuring perceived stress, with most research focusing on college student samples (21). Ramirez and Hernandez assessed the validity and reliability of this questionnaire using a random sample of Mexican learners. They reported satisfactory internal consistency ( $\alpha = 0.83$ ), indicating acceptable reliability. Convergent validity was also evaluated by examining the correlation between the Beck Depression Inventory (BDI), the scale of emotional exhaustion (ECE), and the PSS. They showed that BDI and ECE positively correlated with the PSS ( $r_s = 0.521$ ,  $P = 0.001$  and  $r_s = 0.553$ ,  $P = 0.001$  for ECE and BDI) (22). This questionnaire has been standardized in Iran, and a Cronbach's alpha of 0.73 was reported (23).

### 3.3. Ethical Considerations

Data analysis was conducted considering the anonymity of the participants. Also, all procedures undertaken in our work adhered to the ethical principles of the Declaration of Helsinki (World Medical Association for Human Subjects) and received approval from the University of Social Welfare and Rehabilitation

**Table 2.** Paired Sample *t*-Test Results on Changes in Perceived Stress and Anxiety from Pre-test to Post-test<sup>a</sup>

Variables	Pre-test	Post-test	Mean Difference	SE	df	<i>t</i>	P-Value	Effect Size (Cohen's <i>d</i> )
Perceived stress	27.79 ± 5.62	25.18 ± 4.98	2.60	0.209	102	12.45	> 0.001	0.57
Test anxiety	19.82 ± 5.19	16.95 ± 4.23	2.86	0.219	102	13.05	> 0.001	0.62

<sup>a</sup> Values are presented as mean ± SD.

Sciences. All participants provided written informed consent before participating in the study (No. P220300 in the National System of Innovative Educational Activities, Ministry of Health, Medical Education; code of ethics No. 484/23 dated 18.11.2023 from the Research Ethics Committee of the University of Social Welfare and Rehabilitation Sciences).

### 3.4. Statistical Analysis

The collected data were statistically analyzed using SPSS V28 software. The variables were measured and expressed using mean ± SD and frequency (percentage) indicators. At the inferential level, the paired *t*-test was applied to compare pre-test and post-test scores and check the effectiveness of the commitment-based training program. The two assumptions of the paired *t*-test (i.e., the assumption of the absence of outliers and the assumption of the normality of the data distribution) were also considered and reported. The significance level was 0.05.

## 4. Results

The findings indicated that in terms of gender, most of the respondents (87.4%) were female students and 12.6% were male students. Most respondents (i.e., 90.3%) were single, and 9.7% were married. 81.6% of the respondents were in the first semester of their studies, and 18.4% were in the second semester. Most respondents (92.2%) were not officially employed, and only 7.8% were employed. Only 1 participant (1%) had a history of a specific physical illness. Most respondents (88.3%) lived with their families, 6.8% lived in a single house, and 4.9% lived in a dormitory.

The results related to the contextual variables of age and average GPA indicate that the mean age of the participants is  $21.73 \pm 3.14$  years, with ages ranging from 18 to 33 years. Additionally, the mean GPA is  $17.13 \pm 0.90$ , with GPA scores ranging from 14 to 19.

The paired *t*-test was employed to compare the changes in perceived stress during the post-test to the pre-test and the effectiveness of the commitment-based

training program intervention on perceived stress and test anxiety. Table 2 presents the obtained results.

The results showed that the average test anxiety and perceived stress in the pre-test were 19.82 and 27.79, respectively, which declined to 2.86 and 2.60 in the post-test and reached 16.95 and 25.18. This reduction is statistically significant and suggests the effectiveness of the commitment-based training intervention on test anxiety. The effect size was measured with Cohen's *d* Index, which was equal to 0.62 and 0.57 for test anxiety and perceived stress, respectively, indicating the intervention's moderate effectiveness on the investigated outcomes.

## 5. Discussion

The present study was implemented to determine the influence of the training program based on ACT on test anxiety and perceived stress in the students of the University of Rehabilitation Sciences and Social Health in 2021. The results showed that this treatment significantly reduces students' test anxiety. This finding is consistent with the research of Burckhardt et al. (24). Reviewing relevant studies in the previous two decades indicates that among the new treatments for psychological-educational problems, ACT treatment is more compatible with these conditions. This therapy is a unique type of behavioral therapy whose purpose is to investigate human problems in different fields in a conscious, compassionate way and encourage people to follow their values (what they consider important in their lives) (25-27). In this treatment, the practice of committed behaviors with the methods of acceptance, failure, and basic discussions regarding the goals and values of the individual and the necessity of clarifying the values and training mindfulness and flexibility, will all lead to a reduction in the intensity of stress (25, 28).

Acceptance and commitment therapy helps students first suspend their judgments about bad experiences. Afterward, they direct their awareness from the umpteenth time seriously and slowly to the flow of events in the consciousness field. By increasing awareness and mindfulness, this treatment activates the issues in the student's consciousness and reduces bad



experiences, including probation and academic failure. Therefore, sensory receptors receive environmental stimuli and move from sensory memory to short-term memory. Besides, they are transferred to long-term memory with encoding and repetition. These points indicate the importance of implementing some strategies to aid this process. Acceptance and commitment therapy accelerates these measures (23, 29). On the other hand, the findings of the works conducted on the ACT efficacy show that this treatment is efficient in decreasing factors such as stress, depression, anxiety, cognitive dissonance, and fear. Moreover, these factors are considered important components in reducing students' academic dropout (30). Hence, it can be argued that ACT diminishes academic underachievement among students by mitigating the factors mentioned. Various authors have suggested that such therapy induces alterations in cognitive patterns or individuals' perceptions of their thoughts. For instance, Kabat-Zinn maintains that observing pain and anxiety-related thoughts without judgment may lead individuals to realize that these are merely thoughts and do not necessarily reflect truth or reality, thereby reducing the inclination towards avoidance or escape behaviors (31). Twohig et al. also reports that when individuals observe their thoughts and feelings and label them descriptively, they realize that these perceptions may not always accurately reflect reality. Based on these definitions of ACT, the efficacy of its components in reducing academic procrastination can be elucidated (29).

The present research aimed to determine the impact of the training program based on ACT on perceived stress and test anxiety in the students of the University of Social Welfare and Rehabilitation Sciences in 2022. As can be inferred from the research results, the treatment strategy based on ACT for negative internal experiences (including anxiety) does not eliminate these experiences. This therapeutic approach emphasizes experiencing negative emotions (anxiety) instead of suppressing them. This intervention provides the ground to lead a person towards his personal values despite having negative emotions and without suppressing them (29).

Moreover, our findings are consistent with previous ACT-based treatment approaches for university students. Numerous studies have shown that ACT can impact psychological well-being, in general, and levels of distress/stress, specifically (11-13). These results are consistent with those reported in the present study. One of the limitations of this research was the lack of a control group in this work and the lack of a sufficient

sample of students from other universities. Therefore, it is not easy to generalize these results to students from other universities. In future research, it is recommended to compare ACT-based treatment with traditional cognitive-behavioral methods to reduce stress and anxiety caused by the test. Also, these interventions should be implemented in a sample of students in different grades from different universities.

### 5.1. Conclusions

Considering stress, anxiety, and academic failure as some of the important and influential dimensions of psychological issues, studying such factors is a critical issue. Accordingly, in solving the problems of students who are falling behind, psychological factors (i.e., stress, and anxiety) should be considered as crucial as the academic competence of university students. Therefore, to reduce academic-associated stress (i.e., test anxiety), psychological approaches should be used continuously and accurately. Our findings show that psychological treatments, including treatment based on ACT, have favorable effects. Also, considering the magnitude of procrastination among students and the increase in probation and academic failure among university students, the findings of the present work can be considered for future studies regarding the mentioned issues. Overall, ACT-based treatment can probably lead to a change in people's behavior by creating flexibility in cognitive and emotional components, thereby yielding satisfactory results.

### Footnotes

**Authors' Contribution:** A. N. A., A. E., and O. R. studied concept and design, statistical analysis, data acquisition, data interpretation, manuscript drafting, and administrative and technical aspects. H. R., M. J. G., S. S. B., and S. T. Y. conceptualized and designed the study, drafted the manuscript, and substantially revised the manuscript for critical intellectual content. A. F., L. F. M., and R. M. performed data acquisition and interpretation of findings. All authors have reviewed and endorsed the manuscript.

**Conflict of Interests Statement:** The authors affirm that no conflicts of interest exist.

**Data Availability:** If necessary, the corresponding author will provide access to the data.

**Ethical Approval:** All steps of the present research followed the ethical guidelines of the Declaration of Helsinki (World Medical Association for Human

Subjects) and were approved by the University of Social Welfare and Rehabilitation Sciences (ethics code No. 484/23 dated 18.11.2023). Considering that permission was obtained from the meded system of the Ministry of Health, we received it in a handwritten letter from the ethics committee, all of the procedures in Helsinki have been carefully followed.

**Funding/Support:** The authors declared that they have no conflict of funding/support.

**Informed Consent:** All participants provided written informed consent before their involvement in the study.

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