# Efficiency of assertiveness training on the stress, anxiety, and depression levels of college students (Randomized control trial)

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**Abstract:**

**BACKGROUND:** The significance of assertiveness in promoting mental health is well acknowledged. To investigate the impact of assertiveness training on lowering anxiety, stress, and depression among college students at a private university in Cairo.

**MATERIALS AND METHODS:** In this study, three questionnaires were used: demographic, Depression Anxiety Stress Scales (DASS-21), and Rathus Assertiveness Schedule. Students were randomly allocated to either a group that underwent assertiveness training (experimental group) or a control group. A randomized controlled trial (RCT) was utilized with a pre- and post-assessment. The training program is an adapted version of DBT skills training. The training program includes mindfulness, assertiveness, and problem-solving skills through eight 90-min group sessions.

**RESULTS:** There were ($n = 50$) students in the experimental group compared with ($n = 50$) the control group. Assertiveness group, in comparison with control group, resulted in significantly greater reductions in stress as shown in DASS scores (the effect size, $d = 0.52$, $P < .000$), anxiety (the effect size, $d = 0.30$, $P < .000$), depression (the effect size, $d = 0.21$, $P < .000$), and total scores of DASS (the effect size, $d = 0.45$, $P < .000$). Assertiveness group, in comparison with control group, resulted in significantly greater increase in assertiveness as shown in RAS scores (the effect size, $d = 0.38$, $P < .000$).

**CONCLUSION:** It is possible that increasing an individual's level of assertiveness might be a helpful strategy for reducing feelings of anxiety, stress, and depression.

**Keywords:**

Anxiety, assertiveness, depression, stress, university's students

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## Introduction

Adolescence is a stage of growth marked by significant stress and tension because of the multiple obstacles that adolescents experience. Their physical, cognitive, emotional, and sexual qualities are subject to change.[1] Anxiety, stress, and depression are common among adolescents because of their difficult social relationships. Adolescents may experience anxiety, stress, and depression as a result of dysfunctional and challenging social relationships. Not being able to maintain and form good and constructive relationships with others can have a negative impact on and limit the adolescent's efficacy, as it will not help them build and develop a healthy personality, nor will it help them achieve their mental and emotional growth.[2] Also, university students usually are more prone to anxiety than other people because of experiencing

several stressors during their academic lives.[3] Stressors such as exams, fear of failure, family, and social conflicts affect students negatively regarding their grades at the university and entire their quality of life.[3]

Depression, anxiety, and chronic stress negatively impact adolescents' socialization, social networking, and academic accomplishment.[4] In this regard, students have a number of options available to them in terms of therapeutic treatments that they can choose from to lower their levels of anxiety and stress.[5] One of these approaches is behavioral therapy, which may consist of assertiveness training or other similar activities. Training in assertiveness is a form of structural intervention that may be utilized for the enhancement of social relationships, the treatment of anxiety disorders, and phobias.[6] Also, teaching adolescent student's self-awareness, communication, decision-making, assertiveness, and problem-solving reduced their levels of depression.[7]

Assertiveness is the genuine expression of one's own thoughts, needs, desires, and emotions without rejecting or violating the rights of others. Assertiveness is an important communication skill that can help individuals to build healthy relationships and avoid conflicts. It involves being clear, direct, and respectful in expressing oneself while also considering the feelings and perspectives of others.[8] The assertiveness training is a structured intervention strategy used to improve the efficacy of social connections.[9] Previous research has highlighted the importance of assertiveness abilities in lowering students' interpersonal stress, fostering successful team connections, and providing behavioral reinforcement and self-assurance.[10] Thus, assertiveness helps students communicate more effectively with others.[11]

Assertiveness promotes equality in human relationships, enables individuals to behave in accordance with their own interests, encourages them to fight for their personal rights without infringing the rights of others, and permits them to express their real emotions.[12]

The objective of an assertiveness training is to increase people's self-esteem, help them to express their thoughts and opinions, and so increase their self-worth.[13] The assertiveness program's benefits include boosting self-assurance, developing social communication skills, teaching how to express one's rights while respecting the rights of others, and raising life satisfaction and enjoyment.[12] Teaching adolescents' assertiveness skills such as problem-solving enables them to organize their priorities, handle their challenges, and make more effective use of social support.[14]

Several studies examined the effectiveness of assertiveness training on mental health. Eslami *et al*.[15] in 2016 for instance investigated the impact of assertiveness training on the stress, anxiety, and depression levels of students. They found that teaching students assertiveness training led to a reduction in the students' levels of anxiety, stress, and depression. In addition, Ganji *et al*.[16] in 2022 investigated the impact of an assertiveness program on drug use propensity, mental health, and quality of life among clinical students at Shahrekord University of Medical Sciences. They discovered that training in assertiveness as a preventative program can decrease students' propensity for addiction and enhance their mental health and quality of life. Also, Abdelaziz *et al*.[17] in 2020 evaluated the efficacy of an assertiveness training program on mental well-being and work engagement. They discovered that assertiveness training had a positive effect on strengthening assertiveness skills, boosting job engagement, and enhancing mental health.

Thus, in the current study, the aim is to investigate the impact of assertiveness training on the mental health of college students. We predict that teaching assertiveness will enhance the mental health of students. This is the first study to investigate the effectiveness of assertiveness training on the mental health of the private university students in Egypt.

## Materials and Methods

**Study design and setting:** This study is a repeated-measure, randomized control trial design. Assessors were blind to students' treatment condition allocations. The study was conducted between September 2022 and January 2023. The study was carried out in the British University in Egypt.

**Study participants and sampling:** All individuals were university students and meet the inclusion criteria. Inclusion criterion was as follows: Being an active student at the British University in Egypt. Exclusion criteria were as follows: 1) Receiving treatment at the hospital during the time that the study was in progress, 2) Having been diagnosed with psychotic disorders, and 3) Having cognitive difficulties. Before randomization, students were required to sign the informed consent and read the information sheet.

**Randomization and Masking** Web-based randomization software (http://randomizer.at) was used to allocate students to the experimental or control groups in a 1:1 ratio.

**Data collection tools and techniques:** The study data were collected using:

*Personal Information* consists of closed-ended questions regarding the sociodemographic traits, personal, family-related, social, financial, educational, and academic aspects of the participants.

*Depression Anxiety Stress Scales (DASS-21)*[18]: The DASS was used to assess the students' mental health. The DASS is a self-report, well-validated instrument that has been proved across diverse demographics by a number of studies.[19] In the present research, test–retest stability was good after one week (.89).

*Rathus Assertiveness Schedule (RAS):* The typical assertiveness scale developed by Rathus consists of thirty questions. RAS consists of thirty questions, each with a scenario or a statement. It is a Likert scale in 6 degrees, ranges from "they entirely agree with my qualities" to "they completely disagree with my traits."[20] The lowest possible score is 30, and the highest possible score is 180. A higher overall score suggests stronger self-assertiveness. Rathus' assertiveness scale exhibited good internal consistency in the current study with Cronbach's α value (0.87).

**Study process:** Students were recruited via the university's website; we advertised for students to participate in the research on the University's website. Therefore, we requested that students who agreed to participate to complete the assessments at the university's counselling center. Each student required around 20 to 25 minutes to complete the surveys. Then, students were randomized to either experimental or control group. In both experimental and control groups, DASS and assertiveness were collected from all students two times, three months apart. Students in the experimental group (Assertiveness training group) had an Assertiveness training program and meet weekly for 10 weeks. There were three experimental groups, each group comprised of 15 students except for one group that had 20 students. Furthermore, students in the assertiveness group were allowed to make telephone consultations and email communications to help them in their homework and exercises related to the training (Please see CONSORT 2010 Flow Diagram in Appendix A).

### Ethical consideration
All Students' data and demographic information were stored at OneDrive of the British University in Egypt. Approval from the British University in Egypt Institutional Review Board was obtained to conduct the study (IRB Protocol CL-2302). Students signed up for information sheet and consent form. They were informed of the nature and procedure, the aims of the study, confidentiality of data, choice to participate in the study, and right to withdraw at any time from the study.

**Study therapists:** There was one clinical psychologist (Dr. ElBarazi), who was trained to administer DBT. Each group meeting was held by the clinical psychologist once a week (meeting 90 minutes).

**Training program:** The training sessions were based on the Dialectical Behavior Therapy training manual.[21] Each training group received one pre-training session, one ending session, and eight 90-min sessions of assertiveness training (one session per week). The training included group gathering, discussion, and listening to students' experiences. Homework and exercises between sessions were sent to the students by emails. Also, telephone consultations were provided as needed. The training content is shown in Table 1.

**Supervision and fidelity**: The audios of the sessions were recorded with the agreement of all participants to assess adherence to the DBT principles. The sessions were split into modules of 15 minutes, which were selected at random for compliance checks. A DBT researcher and psychotherapist who did not participate in the current training program later reviewed the session content. Based on the dialectical behavior therapy manual that was developed by Linehan in 2015, the training program's procedures were evaluated, and the modules were assessed as acceptable or not. It was considered that more than (85%) of the sessions were performed properly.[21]

**Outcome measures:** The primary outcome measures were DASS and Rathus assertiveness schedule. All primary outcomes were collected at baseline and 3-months. SPSS Sample Power was employed to ensure that the sample size is sufficient to detect meaningful differences in primary outcomes. We set the following parameters based on previous research: the two-tailed test of significance, desired power = 0.80, unstructured covariance matrix, two timepoints, correlation = 0.50 between repeated assessments, Margin of error = 5%. With (100 participants), the study has 80% power to detect a medium effect size of 0.65 for group differences on outcomes.

### Data analysis
The data were evaluated using the IBM SPSS Statistics, version 23 software program. Descriptive statistics (means, standard deviations, frequencies, and percentages) were used to describe the sociodemographic and baseline characteristics of this sample. DASS and Rathus assertiveness schedule outcomes were modeled using generalized estimating equations (GEE).[22] To model individuals across timepoints, a temporal within-subjects autoregressive [AR (1)] correlation matrix was utilized. The distributions of the outcome measures were used to specify the models. DASS and Rathus assertiveness schedule scores were modeled using identity link functions for normal distributions.

**Table 1: DBT content per session**

| Session no | Main Topic | Content |
|---|---|---|
| Pre-session | Introduction + Mindfulness | A brief overview of the assertiveness training topics that will be addressed in each session. The main concepts and aims of the assertiveness will be explained. |
| | | Educating mindfulness skills as they are important in regulating emotions. Being mindful of the emotions without judgment. Teaching the participants, the relaxations exercises, and methods of overcoming the barriers to healthy emotions. Introducing strategies for living in the present moment. |
| 1 | Pros and Cons of Using Interpersonal Skills + Acceptance | Decide whether to use interpersonal skills instead of power tactics or giving up and giving in to another person. |
| | | Educating the acceptance techniques (without judgment or evaluation) of both self and other behaviors |
| 2 | Factors in the Way of Interpersonal Effectiveness + Clarifying Goals in Interpersonal Situations. | Troubleshooting Interpersonal Effectiveness Skills. |
| | | It is the essential task of figuring out (1) what they actually want in any given situation and how important that is, compared to (2) keeping a positive relationship and (3) keeping their own self-respect. |
| 3 | Getting What You Want (DEAR MAN). | The skills for asking for something, saying no to another's request, and resisting pressure and maintaining your point of view. The skills are Describe, Express, Assert, reinforce; and (stay) Mindful, Appear confident, and negotiate. Participant can use the term DEAR MAN to remember these. |
| 4 | Writing Out Interpersonal Effectiveness Scripts+Tracking Interpersonal Effectiveness Skills Use | Figuring out what to say and do before practicing DEAR MAN skills. |
| | | First, person should write down his objectives, relationship, and self-respect goals. |
| | | Person is asked to figure out and write down his priorities and asks about conflicts in priorities. Finally, person is asked to record whether or not his objective was met, and what effect the interaction had on the relationship and his self-respect. |
| 5 | Guidelines for Relationship Effectiveness: Keeping the Relationship (GIVE). | Relationship effectiveness skills are aimed at maintaining or improving relationship with the other person while participants try to get what they want in the interaction. The term GIVE is a way to remember these skills. It stands for (be) Gentle, (act) Interested, Validate, and (use an) Easy manner. |
| 6 | Guidelines for Self-Respect Effectiveness: Keeping Respect for Yourself (FAST). | Self-respect effectiveness skills help participants to keep or improve their self-respect while they try to get what they want in an interaction. The term FAST is a way to remember these skills: (be) Fair, (no) Apologies, Stick to values, and (be) Truthful |
| | | Evaluating Options for Whether or How Intensely to Ask for Something or Say No. |
| 7 | Walking the Middle Path + Problem-solving | The skills in this section: dialectics, validation, and behavior change strategies. A dialectical stance is essential for walking a middle path and for decreasing a sense of isolation, conflict, and polarities. Validation of others' feelings, beliefs, experiences, and actions are essential in building any relationship of trust and intimacy. Using Behavior Change Strategies Effectively. Reinforcement, extinction, and punishment each involve different kinds of consequences. |
| | | Teaching the participant to identify the ABCs of problem-solving in which (A. Alternatives. Brainstorm alternative responses. B. Best ideas C. Commitment to implementation). Students were taught to evaluate the list of choices and choose the best ideas to implement and identify the time and place to try the new responses. |
| 8 | Finding and Getting People to Like You. | Building Relationships and Ending Destructive Ones. |
| | | Finding potential friends and getting them to like you often both require an active effort. Teaching participants where to look and how to look. Record their practice efforts for this on Interpersonal Effectiveness |
| Ending | Revision for the techniques | Revising the methods to cope with the situations in healthy ways |
| | | Answering queries from students, concluding, and ending. |

We used GEE because it extends the generalized linear model, which processes corresponding data from repeat measurements, requires no parametric distribution assumption and robust inference for an incorrect description of the internal correlation of subjects, and provides good indications of within-subject correlations.[23] At the $\alpha = 0.05$ threshold, both simple and main effects were judged significant (two-tailed).[24] To account for Type I error, Bonferroni corrections were used to all models of DASS and Rathus assertiveness schedule outcomes.

**Treatment Adherence**: All students in the experimental and control groups came to participate in assessments 1 and 2 since their involvement was considered as an extra activity. Their involvement was rewarded in the form of extra credit for their undergraduate psychology course.

## Results

**Demographic characteristics:** The control group contained ($n = 50$) students, of which (34%) female students, whereas the experimental group

included (*n* = 50) students, of which (31%) female students. All of the students who participated in this study were in their fifth year of pharmacy school and varied in age from 20 to 23.

Table 2 presents the demographic characteristics of the experimental and control groups. No differences were discovered between-groups characteristics.

**Effects of Assertiveness Training on the Stress, Anxiety, and Depression Levels of College Students:** Table 3 shows that assertiveness group compared with control group resulted in significantly greater reductions in stress as shown in DASS scores (the effect size, *d* = 0.52, *P* < .000), anxiety (the effect size, *d* = 0.30, *P* < .000), depression (the effect size, *d* = 0.21, *P* < .000), and total scores of DASS (the effect size, *d* = 0.45, *P* < .000). Assertiveness group compared with control group resulted in significantly greater increase in assertiveness as shown in RAS scores (the effect size, *d* = 0.38, *P* < .000).

## Discussion

The current study was aimed to investigate the impact of assertiveness training on reducing levels of anxiety, stress, and depression among college students at a private university in Cairo. It was recently discovered that there is a link between anxiety, stress, depression, and assertiveness.[6] According to the findings of our study, assertiveness training is a psychological technique that is effective in lowering levels of anxiety, stress, and depression.

This study revealed a significant difference in the mean levels of stress, anxiety, and depression between the experimental group before and after intervention, but not in the control group. In addition, the mean assertiveness has increased significantly in the experimental group but not in the control group. We may conclude that this is a result of assertiveness training. Consistent with previous studies' findings,[25-27] our data indicate that assertiveness training increases assertiveness and decreases anxiety.

**Table 2: Comparison between participants' sociodemographic characteristics for the experimental and control groups**

| Variables | Control *n*=50 | Experimental *n*=50 | Total *n*=100 | $\chi^2$ | Sig |
|---|---|---|---|---|---|
| Gender | | | | | |
| Males | 16 | 19 | 35 | 0.39 | 0.67 |
| Females | 34 | 31 | 65 | | |
| Region of residence | | | | | |
| Urban | 49 | 50 | 99 | 1.01 | 1 |
| Rural | 1 | 0 | 1 | | |
| Number of siblings | | | | | |
| 0 | 1 | 2 | 3 | 2.64 | 0.45 |
| 1 | 5 | 10 | 15 | | |
| 2 | 13 | 13 | 26 | | |
| >3 | 31 | 25 | 25 | | |
| Income status | | | | | |
| Income lower than expenses | 2 | 3 | 5 | 9.6 | 0.008 |
| Equal income and expenses | 38 | 23 | 61 | | |
| Income higher than expenses | 10 | 24 | 34 | | |
| Any medical illness | | | | | |
| No | 50 | 48 | 98 | 2.04 | 0.49 |
| Yes | 0 | 2 | 2 | | |
| Loneliness | | | | | |
| Alone | 1 | 0 | 1 | 1.01 | 1 |
| Living with family | 49 | 50 | 99 | | |
| Parental Divorce | | | | | |
| No | 45 | 43 | 88 | 0.37 | 0.76 |
| Yes | 5 | 7 | 12 | | |
| Physical Activity | | | | | |
| High physical activity (daily exercise) | 35 | 29 | 64 | 3.8 | 0.14 |
| Average physical activity | 15 | 18 | 33 | | |
| Poor physical activity | 0 | 3 | 3 | | |
| Are you happy with your social life | | | | | |
| Rarely | 10 | 6 | 16 | 1.5 | 0.46 |
| Average | 37 | 42 | 79 | | |
| Most of the time | 3 | 2 | 5 | | |

**Table 3: Observed means of DASS and assertiveness at baseline and end-of-treatment (3 months) with model-based treatment effects (for the experimental and control groups)**

| Outcomes | M±SD | | | Estimate | 95% CI | | *P* |
|---|---|---|---|---|---|---|---|
| | **Experimental** | **Control** | **Total** | | | | |
| Stress | | | | | | | |
| Baseline | 11.8±4.4 | 12.7±3.7 | 12.2±4.1 | _ | _ | _ | _ |
| End-of-treatment | 9.6±3.9 | 12.4±3.8 | 11.05±4.1 | -1.9 | -2.2 | -1.5 | 0.000 |
| Anxiety | | | | | | | |
| Baseline | 9.1±3.3 | 8.9±3.2 | 9.03±3.2 | _ | _ | _ | _ |
| End-of-treatment | 8.1±3.4 | 8.7±3.3 | 8.4±3.4 | -0.8 | -1.06 | -0.6 | 0.000 |
| Depression | | | | | | | |
| Baseline | 13.04±4.8 | 10.1±4.7 | 11.5±4.9 | _ | _ | _ | _ |
| End-of-treatment | 12.02±4.6 | 9.6±3.4 | 10.8±4.2 | 2.9 | 1.1 | 4.7 | 0.002 |
| DASS total | | | | | | | |
| Baseline | 33.7±9.5 | 31.5±8.1 | 32.6±8.9 | - | - | - | - |
| End-of-treatment | 29.4±9.3 | 30.5±6.4 | 30.02±8.01 | -3.2 | -5.01 | -1.5 | 0.000 |
| Assertiveness | | | | | | | |
| Baseline | 65.4±16.4 | 62.2±18.3 | 63.8±17.3 | - | - | - | - |
| End-of-treatment | 71.8±17.1 | 62.8±18.3 | 67.3±18.2 | 5.7 | 4.6 | 6.9 | 0.000 |

CI=Confidence interval

Several mental diseases, such as stress, anxiety, and depression, may come from passive or aggressive behaviors, such as disregarding adolescents' own rights and exhibiting uneasiness in multiple social encounters. The incapacity of adolescents, for instance, to articulate themselves and say "no" at the appropriate time is a significant source of psychological distress.

Training in assertiveness is a form of structural intervention that may be utilized for the treatment of anxiety disorders, stress, and the enhancement of social relationships. This training consists of directing, practicing, role playing, providing feedback, modelling, and reviewing the behaviors that have been learned. Being assertive is a crucial component of both behavioral and interpersonal skills, and it is often considered to be one of the most essential and fundamental social skills. Training in assertiveness is beneficial to the mental well-being of students.[28]

Our findings mirrored those of Eslami *et al*.[15] who discovered that giving high school students assertiveness training leads to a reduction in the students' levels of anxiety, stress, and depression.

In addition, our findings are consistent with the findings of Abdelaziz *et al*.[17] in which they discovered that assertiveness training demonstrated a statistically significant change with relation to the assertiveness skills, psychological well-being, and job engagement of the students.

One explanation of our results may be that students with low assertiveness have stress and anxiety; therefore, they cannot express their feelings, opinions, needs, or perspectives because they lack confidence and are

frightened of losing friends and respect.[26] Therefore, individuals get worried out of fear of being rejected or adversely evaluated. Therefore, the more the increase in assertiveness via training, the greater the decrease in anxiety, tension, and sadness, and vice versa.

### Limitation and recommendation
**Recommendations:** According to our findings, a significant number of college students experience emotional difficulties, and those students who are experiencing emotional difficulties are more likely to have challenges in their social lives due to the low degree of assertiveness. The findings of our research can be utilized to educate mental health professionals working with adolescents so that they can develop effective prevention methods. Additionally, studies should study long-term consequences by doing long-term follow-ups after the experimental intervention is delivered.

### Limitations
First, the participant's ability and willingness to provide sensitive and personal information related to their stress, anxiety, and depression. Second, generalizing the results to people outside the university students should be done with caution. Future research may use longitudinal data on the association between anxiety and assertiveness that include a larger sample of participants. Third and the most important limitation of the current study are not addressing the underlying variables that cause depression and anxiety disorders in this group. Future research could investigate these underlying variables to gain a more comprehensive understanding of the development and treatment of depression and anxiety disorders in this population. Additionally, interventions that target these underlying variables may be more effective in reducing symptoms of depression and anxiety.

## Conclusion

According to the findings of our study, a person's levels of anxiety, stress, and depression decrease in direct proportion to their level of assertiveness. People who are assertive have a better chance of gaining security in stressful situations, are more likely to have self-confidence, and have positive relationships with others.

## Conflicts of interest

There are no conflicts of interest.

## References

1. Wehmeier PM, Schacht A, Barkley RA. Social and emotional impairment in children and adolescents with ADHD and the impact on quality of life. J Adolesc Health 2010;46:209–17.

2. Carter CS. Effects of Formal Dance Training and Education on Student Performance, Perceived Wellness, and Self-Concept in High School Students. University of Florida; 2004.

3. Mofatteh M. Risk factors associated with stress, anxiety, and depression among, university undergraduate students. AIMS Public Health 2020;8:36–65.

4. Liu X, Ping S, Gao W. Changes in undergraduate students' psychological well-being as they experience university life. Int J Environ Res Public Health 2019;16:2864.

5. Hsu JL, Goldsmith GR. Instructor strategies to alleviate stress and anxiety among college and university stem students. CBE Life Sci Educ 2021;20:es1.

6. Ganji F, Khani F, Karimi Z, Rabiei L. Effect of assertiveness program on the drug use tendency, mental health, and quality of life in clinical students of Shahrekord University of Medical Sciences. J Edu Health Promot 2022;11:48.

7. Kunzler AM, Helmreich I, König J, Chmitorz A, Wessa M, Binder H, *et al*. Psychological interventions to foster resilience in healthcare students. Cochrane Database Syst Rev 2020;7:CD013684.

8. Peneva I, Mavrodiev S. A historical approach to assertiveness. Psychological Thought 2013;6:3-26.

9. Turner NE, Macdonald J, Somerset M. Life skills, mathematical reasoning and critical thinking: A curriculum for the prevention of problem gambling. J Gambl Stud 2008;24:367–80.

10. Nishina Y, Tanigaki S. Trial and evaluation of assertion training involving nursing students. Yonago Acta Medi 2013;56:63–8.

11. Omura M, Maguire J, Levett-Jones T, Stone TE. Effectiveness of assertive communication training programs for health professionals and students: A systematic review protocol. JBI Database System Rev Implement Rep 2016;14:64–71.

12. Lee SE, Kim E, Lee JY, Morse BL. Assertiveness educational interventions for nursing students and nurses: A systematic review. Nurse Educ Today 2023;120:105655.

13. Rohsig V, de Souza AB. Assertiveness training during early undergraduate years has the potential to increase students' confidence and ability to act as patient advocates. Evid Based Nurs 2021;24:40.

14. Forneris T, Danish SJ, Scott DL. Setting goals, solving problems, and seeking social support: Developing adolescents' abilities through a life skills program. Adolescence 2007;42:103–14.

15. Eslami AA, Rabiei L, Afzali SM, Hamidizadeh S, Masoudi R. The effectiveness of assertiveness training on the levels of stress, anxiety, and depression of high school students. Iran Red Crescent Med J 2016;18:e21096.

16. Ganji F, Khani F, Karimi Z, Rabiei L. Effect of assertiveness program on the drug use tendency, mental health, and quality of life in clinical students of Shahrekord University of Medical Sciences. J Educ Health Promot 2022;11:48.

17. Abdelaziz EM, Diab IA, Ouda M, Elsharkawy NB, Abdelkader FA. The effectiveness of assertiveness training program on psychological wellbeing and work engagement among novice psychiatric nurses. Nurs Forum 2020;55:309–19.

18. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety and Stress Scales. 2nd ed. Sydney: Psychology Foundation; 1995.

19. Crawford JR, Henry JD. The Depression Anxiety Stress Scales (DASS): Normative data and latent structure in a large non-clinical sample. Br J Clin Psychol 2003;42:111–31.

20. Rathus SA. A 30-item schedule for assessing assertive behavior. Behav Ther 1973;4:398–406.

21. Linehan MM. DBT Skills Training Manual. 2nd ed. New York, NY: Guilford Press; 2015.

22. Ballinger GA. Using generalized estimating equations for longitudinal data analysis. Organ Res Methods 2004;7:127–50.

23. Zeger SL, Liang KY, Albert PS. Models for longitudinal data: A generalized estimating equation approach. Biometrics 1988;44:1049–60.

24. Selvin S. Statistical Analysis of Epidemiologic Data. 2nd ed. New York: Oxford University Press; 1996.

25. Noh GO, Kim M. Effectiveness of assertiveness training, SBAR, and combined SBAR and assertiveness training for nursing students undergoing clinical training: A quasi-experimental study. Nurse Educ Today 2021;103:104958.

26. Mohebi S, Sharifirad GH, Shahsiah M, Botlani S, Matlabi M, Rezaeian M. The effect of assertiveness training on student's academic anxiety. JPMA. J Pak Med Assoc 2012;62 (3 Suppl 2):S37–41.

27. Krupa T, Radloff-Gabriel D, Whippey E, Kirsh B. Reflections on…. Occupational therapy and assertive community treatment. Can J Occup Ther 2002;69:153–7.

28. Taghavi T, Neiestanak ND, Aghajani M, Mehran A. Assertiveness and anxiety in midwifery & nursing students. Hayat 2009;15:61-72.

# Appendix A

CONSORT 2010 Flow Diagram