Original Article

Access this article online

Quick Response Code:

Website: www.jehp.net

DOI: 10.4103/jehp.jehp_1486_20

The effect of counseling based on acceptance and commitment therapy on anxiety, depression, and quality of life among female adolescent students

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Abstract:

BACKGROUND: Adolescence is a stressful time period. Adolescents experience new changes physically, mentally, emotionally, and socially. The purpose of this study was to determine the effects of acceptance and commitment therapy (ACT) on anxiety (primary outcome), depression, and quality of life (secondary outcomes) of adolescents.

MATERIALS AND METHOD: This was a quasi-experimental study with pre and postintervention design. One hundred female students aged 16–18 years with mild to moderate anxiety selected through multistage cluster sampling from five educational districts of Tabriz. During six group counseling sessions, students were consulted with the acceptance and commitment approach according to the protocol. Beck Anxiety and Depression Inventory and the World Health Organization brief Quality of Life Questionnaire consultation were completed before, immediately after, and 8 weeks after the consultation. Data were analyzed using repeated measure ANCOVA.

RESULTS: The mean anxiety score decreased significantly immediately after the intervention (mean difference [MD]: −4.0, 95% confidence interval [CI]: −5.9 to − 2.0; $P < 0.001$) and 8 weeks later (MD: −3.9, 95% CI: −5.8 to − 1.9; $P < 0.001$). The mean depression score immediately ($P < 0.001$) and 8 weeks after intervention (MD; −4.2, CI: −1.6 to − 6.8), $P < 0.001$) declined significantly. The mean overall quality of life score increased significantly after the intervention ($P < 0.001$) and 8 weeks later (MD: 4.7, 95% CI: 7.1–2.3, $P < 0.001$) compared to baseline.

CONCLUSIONS: Based on the effectiveness of counseling based on ACT on anxiety, depression, and quality of life in the female students with the mild and moderate anxiety over time, it can be used as a helpful method in high schools.

Keywords:

Acceptance and commitment therapy, adolescence, anxiety, counseling, depression, quality of life

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Received: 19-11-2020
Accepted: 23-06-2021
Published: 26-02-2022

Introduction

Adolescence is one of the most important, sensitive and at the same time, the most crucial period of human life, because it is the transition from childhood to adulthood.[1]

There is unfortunately evidence of a high prevalence of mental disorders in adolescence.[2]

Based on the World Health Organization (WHO), approximately 1.2 billion of the world's population (1 in 6 of the world's population) is adolescents aged 10–19.[3] Based on the 2016 census in Iran, 14%, i.e., approximately 12 million of the population are in the age group of 10–19 years.[4] According to a UNICEF report in 2019, 20% of adolescents suffer mental health problems.[5] Mental health problems during adolescence include stress, depression, anxiety,[6] concerning about the

How to cite this article: Shiri S, Farshbaf-Khalili A, Esmaeilpour K, Sattarzadeh N. The effect of counseling based on acceptance and commitment therapy on anxiety, depression, and quality of life among female adolescent students. J Edu Health Promot 2022;11:66.

future, anger, and aggression.[7] Depressive and anxiety disorders are common in youth, particularly in females and associated with significant impairment (e.g., school failure, social difficulties, substance use, and suicide).[8] Depressive and anxiety disorders commonly co-occur.[9]

Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes like increased blood pressure. People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations.[10] Studies on adolescent anxiety predicted poor total adjustment, poor adjustment at work, poor family relationships, problems with the family members, less life satisfaction, poor coping skills, and more chronic stress. Adolescent anxiety also predicted substance, alcohol abuse/dependence, and anxiety in adulthood.[11]

Depression can happen at any age, but it often begins in teens and young adults. It is much more common in women.[12] Depression in children and adolescents has many negative effects on their mental and social functioning as well as on their physical condition and general health, including their feelings of hopelessness, lack of feeling of pleasure, and satisfaction from daily activities.[13] In children and adolescents with depression, the risk of suicide is three times higher than in normal individuals and twice in individuals with anxiety disorders.[14]

The study of Haghighi *et al*. in Iran showed that the most vulnerable people committing suicide were among the young and adolescent.[15]

The presence of depression, anxiety, or both is associated with life quality impairment.[16]

The WHO defines the quality of life as a "individual's perception of his/her position in life in the context of the culture and value systems in which he/she lives and in relation to his/her goals, expectations, standards, and priorities."[17] Review and meta-analysis of 23 clinical studies of people with mixed anxiety disorders showed that these conditions are associated with significantly compromised quality of life in all areas of physical health, mental health, and family relationships.[18] Researchers have shown in several studies that ACT has been effective in increasing the quality of life of depressed and anxious adults.[19,20]

There are various psychological and pharmacological therapies in treating anxiety and depression. One of psychological therapies is the acceptance and commitment approach.[21]

Acceptance and commitment therapy (ACT) is a novel technique for behavioral therapy that employs mindfulness, acceptance, and cognitive diffusion skills to enhance psychological flexibility and prevent behavioral changes in favor of chosen values.[22]

A study by Golestani-Fard and Rezaee Dehnavi showed that ACT is an effective method for reducing signs of social anxiety in female high school students with social anxiety disorder.[23] Hayes study expressed posttreatment on measures of depression participants in the ACT condition showed significantly greater improvement statistically and 58% showed clinically reliable change in favor of ACT. Outcomes from 3-month follow-up data suggested that improvement increased in magnitude.[24] Various studies in adolescents with social anxiety show that ACT is effective in reducing social anxiety.[25-27]

The results of the study of Hadian and Kazemi showed that ACT was effective in reducing the generalized anxiety of children with type 1 diabetes.[28] The study of Towsyfyan *et al*. which aimed to evaluate the effectiveness of ACT on major depression in female adolescents expressed that ACT had a significant effect in reducing major depression.[29] Livheim *et al*. in two pilot studies examined the effect of ACT on students' stress and depression. The results showed that ACT is an appropriate method to reduce stress and depression.[30]

Given the high rate of anxiety and depression in adolescents and its adverse effects on the quality of life, the importance of mental health in this group and using ACT in Iranian adolescents mostly in the aspect of social anxiety and generalized anxiety disorders as well as the previous recommendation of a systematic review study for further studies on the effect of ACT on adolescents anxiety with larger sample size,[31] this study aimed to determine the impact of counseling based on ACT on adolescents with mild to moderate anxiety.

Subjects and Methods

Study design and setting

The present quasi-experimental study is a before-and-after interventional research (without control group). One hundred female students aged 16–18 years with mild to moderate anxiety selected through multistage cluster sampling from five educational districts of Tabriz.

Study participants and sampling

The study population consisted of all female high school students in Tabriz. Tabriz has five educational districts that sampling was conducted through multistage cluster sampling among public schools (in all 5 districts) after obtaining permission from the General Directorate of Education and school principals. First, ten public girls' schools (two senior high schools from each district) were randomly selected using the website www.random.

org. The researcher then went to the selected high schools and prepared a list of 16–18-year-old students in each high school and listed the names in the list, and 30 students (3 times the required sample size for each school considering probable drop out according to eligibility criteria) were randomly selected from each school using the website www.random.org. After reviewing the study criteria, 10 students from each school with different educational grades (10th, 11th, and 12th), i.e., 100 eligible students in total who were willingness to participate in the study were selected and recruited in the intervention [Figure 1].

Inclusion criteria included girls aged 16–18, lacking stressful events in the past 6 months, having mild to moderate anxiety based on the Beck Anxiety Inventory (BAI), students and parents' consent, not being during the examination season. Exclusion criteria included students with mental illness and taking any psychological medication according to the individual, students with drug addiction, and smoking according to themselves were students with severe anxiety.

The sample size was calculated using G-POWER software based on the results of the study by Beyrami *et al*.[32] for the anxiety variable considering m1 = 33.30 and m2 = 24.21, sd1 = 2.16 and sd2 = 1.68, 95% test power and 95% confidence interval and single sequence test, $n = 15$. Finally, considering the design effect = 5 and 30% attrition were calculated by 100 people and allocated according to the size of students in the school.

The study was conducted from December 22, 2019, to April 20, 2020. All sampling stages except for 8th-week follow-up were completed before the COVID-19 epidemic (counseling sessions were conducted from early January to the mid-February and 8 weeks later, in the past week of April, a link to an online questionnaire was sent to students through WhatsApp for follow-up and completing).

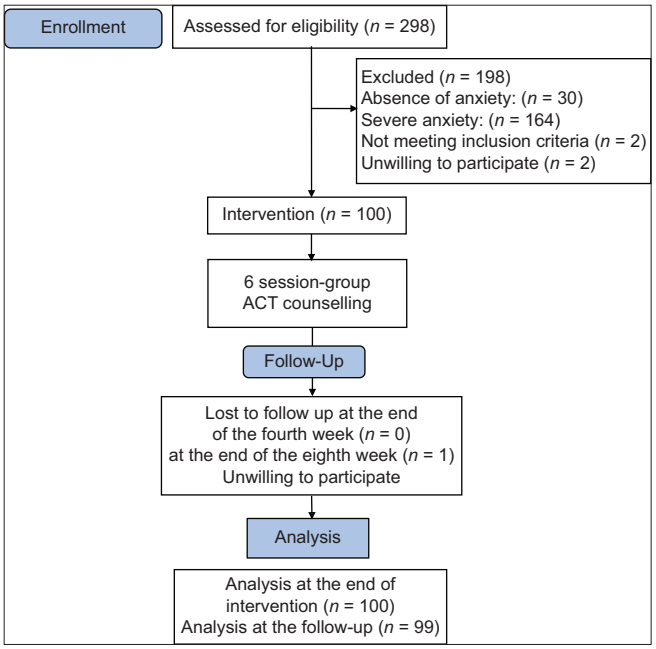

Figure 1: Flowchart of study

Data collection tool and technique

The necessary information in this study was collected through a checklist of inclusion and exclusion criteria, individual-social questionnaire, BAI-I, Beck Depression Inventory-II (BDI-II), and shortened quality of life questionnaire of the WHO.

1. Individual-social questionnaire: It included questions about age, education, parents' age and education, parents' job, family income level, etc.
2. BAI: BAI is a self-report questionnaire designed to measure the severity of anxiety in adolescents and adults. The questionnaire is a 21-item scale in which the participant in each item chooses one of four options that indicate the severity of anxiety. The four options of each question are scored from 0 to 3 on a Likert scale. Each test item describes one of the most common symptoms of anxiety (mental, physical, and panic symptoms). Therefore, the total score of this questionnaire is in the range of 0–63. After adding the scores, the interpretation of the test is as follows: no or minimal anxiety (0–7), mild anxiety (8–15), moderate anxiety (16–25), severe anxiety (26–63). This inventory has high validity. Five types of content, simultaneous, construct, diagnostic, and factor validity were measured for this test, all of which indicate the high efficiency of this tool in measuring the severity of anxiety. Cronbach's alpha coefficient is 0.92, its reliability coefficient by 1-week retest method is 0.75, and the correlation of its items is 0.30–0.76[33]
3. BDI: This questionnaire consists of 21 items to measure the severity of depression and is based on the behavioral, cognitive, and physical symptoms of depression in the past 2 weeks. Each item has a score between zero (a sign of mental health) up to 3 sign of acute and deep depression) and each person can get a score between 0 and 63. After adding the scores, the interpretation of the test is as follows: no or minimum depression (0–10), mild depression (11–20), moderate depression (21–30), severe depression (30 and more). This questionnaire has high validity. Cronbach's alpha coefficient is 0.86 and its reliability coefficient by retest method was reported at a time interval of 0.75 and the correlation of its items 0.73–0.92[34]
4. The WHO Shortened Quality of Life Questionnaire (WHOQOL-BRIEF Questionnaire): It measures four aspects of physical health, mental health, social, and environmental relations with 24 questions (each of the domains has 8, 3, 6, 7 questions, respectively). In each domain, a score can

be converted into a score with a range of 0–100, where the higher the score, the better the quality of life.[35] In Iran, the translation, validity, and reliability of the WHOQOL-BRIEF questionnaire have been measured and it has acceptable validity and reliability in the conditions of the country.[36]

Initially, the most appropriate time for counseling was determined in coordination with the school principals and participants. Due to the selection of 10 students from different grades for each school, the timing of the sessions in the first and second 3 weeks was different and the teachers were asked to cooperate. After explaining the study and stating its objectives to the participants, the BAI-I was completed. Eligible students with mild to moderate anxiety scores were included in the study, and individuals with severe anxiety were referred to a psychologist/psychiatrist. Then, students were placed in 6 group counseling sessions (groups of 10 people in one and ½-h weekly sessions for 6 weeks), in a 4 m × 6 m room in which the chairs were arranged in a circle and group members could see each other and were consulted based on the ACT according to the protocol [Table 1].[37] The educational content of the school lacked any counseling content, and during the counseling, the students did not receive the same counseling. Furthermore, to avoid the stressful effect of the examinations, the intervention did not coincide with the examination season.

In the first session, the participants completed a shortened questionnaire of quality of life of the WHO, Beck Depression, and a demographic questionnaire. At the end of the counseling sessions and 8 weeks after the counseling session, the anxiety, depression,

Table 1: Study protocol

Sessions	Purpose/content/tasks
First session	Purpose: Establishing a therapeutic relationship, acquainting people with the subject of research and giving a general explanation about the ACT approach, explaining about anxiety disorder, and creating insight in students
	Purpose: Introduction and familiarity, expression of research objectives and general explanation about ACT approach, number of sessions and rules of the group counseling, providing explanations about anxiety disorder, symptoms and consequences of this disorder, completing the Brief Quality Of Life questionnaire of the World Health Organization, and demographic questionnaire by students
	Tasks: Recording three of their anxious events or problems and the effects of this anxiety on their personal and social lives
Second session	Purpose: Investigating ineffective control methods and creating creative frustration
	Content: Reviewing the assignments of the previous session and discussing the effects of anxiety on students' lives, reviewing the control methods used by people to deal with anxiety, helping students to realize the ineffectiveness of control methods, by explaining the metaphor of a person in a pit
	Tasks: Recording anxiety control methods and the effects of these methods in three of their anxious events by students in personal and social life
Third session	Purpose: Explaining mindfulness and acceptance
	Content: Reviewing the tasks of the previous session and discussing the futility of control methods, explaining about avoiding painful experiences and their consequences, introducing mindfulness and acceptance, practicing the acceptance of thoughts and feelings
	Tasks: Performing mindfulness exercises during the week such as counting breathing, relaxation exercises and observing thoughts and examining their effect on personal and social life, and recording three examples of these exercises as homework for counseling sessions
Fourth session	Purpose: Cognitive defusion and self-awareness as a background
	Content: Explaining cognitive defusion and distancing oneself from thoughts and observing thoughts without judgment and action independent of mental experiences using train metaphor, explaining the concepts of role, context and types, and moving toward a valuable life with a self-receptive and observant using chessboard metaphor
	Tasks: Cognitive defusion practice and awareness of different sensory and intellectual perceptions and separation of senses and thoughts that are part of the mental content and its effect on personal and social life and recording three examples of these exercises as a task of a counseling session
Fifth session	Purpose: Explaining values
	Content: Examining the tasks of the previous session and examining the effect of cognitive defusion practice and observation of thoughts in students' lives, explaining the concept of values, creating motivation for change, and empowering students for a better life
	Tasks: Identifying and recording values and prioritizing them in ten areas: family, job and profession, friendly relations, marriage, education and personal growth, spirituality, recreation and entertainment, social life, environment and nature, and health
Sixth session	Purpose: Creating a commitment to act in line with values
	Content: Reviewing the tasks of the previous session and discussing the values and barriers to action according to them, creating flexible behavioral patterns in line with the values and creating a commitment to action toward goals and values and overcoming obstacles using the metaphor of passengers on the bus and discussing identifying and implementing behavioral plans in accordance with values and examining its effect on personal and social life
	Reviewing previous sessions and administering the posttest

ACT=Acceptance and commitment therapy

and quality of life questionnaires were completed by the students. The participants were also provided with the researcher's phone number so that they could call for further advice if needed. All counseling sessions were conducted by the researcher and under the supervision of a psychologist familiar with the ACT, and all the principles of counseling were observed.

Data analysis

Data were analyzed using SPSS Version 23 (IBM SPSS Statistics, IBM Corporation, Chicago, IL). The normality of data distribution was assessed by Kolmogorov–Smirnov test and scattering indices such as standard deviation, kurtosis, and skewness. Descriptive statistics including frequency, mean (standard deviation [SD]), and inferential statistics were used to analyze the data. ANOVA test with repeated measures was used to compare the main variables of the study in the baseline, immediately after the intervention, and 8 weeks after the intervention. To investigate the effect of clusters, the intraclass correlation coefficient correlation between clusters was calculated, and the mean scores were compared from generalized estimating equations.

Ethical considerations

After getting a license from the Ethics Committee of Tabriz University of Medical Sciences (Code: IR.TBZMED.REC.1398.310) and coordination and obtaining a license from the Education Office of East Azerbaijan Province, sampling began in Tabriz. The researcher while obtaining informed and written consent of the 100 students who met the inclusion criteria, obtained their parents' consent in person.

Results

Among 298 students surveyed, 104 were qualified. Among them, 4 students eventually dropped out of the study due to lack of interest in continuing to participate, and 100 were willing to participate in the study and were intervened. One person did not participate in follow-up for week 8, eventually, 99 people cooperated until the end of the study.

Mean (SD) age of students was 16.3 (0.9), and mean (SD) ages of fathers and mothers were 47 (6.3) and 42.2 (5.7), respectively. The education level of half of the students' parents was Diploma. Other demographic characteristics are available in Table 2.

Mean (SD) score of participants' anxiety before the intervention was 16.7 (4.8) which was significantly reduced immediately after the intervention to 12.7 (9.3) (mean difference [MD]: −4.0, 95% CI: −5.9 to −2.0; $P < 0.001$) and 8 weeks after intervention to12.8 (8.7) (MD: −3.9, 95%

Table 2: Demographic characteristics of the students

Variable	*n* (%)
Age (years), mean (SD)	16.3 (0.9)
Father's age (years), mean (SD)	47.0 (6.3)
Mother's age (years), mean (SD)	42.2 (5.7)
Father's life status	
Dead	3 (3.0)
Alive	97 (97.0)
Father education	
Illiterate	3 (3.0)
Under diploma	17 (17.0)
Diploma	57 (57.0)
College	23 (23.0)
Mother's education	
Illiterate	5 (5.0)
Under diploma	56 (56.0)
Diploma	29 (29.0)
College	10 (10.0)
Father's job status	
Unemployed	5 (5.0)
Worker	17 (17.0)
Employed	21 (21.0)
Retired	8 (8.0)
Self-employment	44 (44.0)
Lawyer	2 (2.0)
Mather job state	
Housekeeper	90 (90.0)
Working at home	3 (3.0)
Working outdoors	6 (6.0)
Home status	
Lord	84 (84.0)
Renter	16 (16.0)
Family income	
Insufficient	7 (7.0)
Approximately insufficient	44 (44.0)
Sufficient and more	49 (49.0)
Number of children in family, mean (SD)	2.4 (0.8)
Birth rank	
First child	48 (48.0)
Second child	36 (36.0)
Third child	13 (13.0)
Forth child	2 (2.0)
Sixth child	1 (1.0)
Emotional relation with parents	
Poor	13 (13.0)
Good	35 (35.0)
Excellent	52 (52.0)
Life status	
Living with family	89 (89.0)
Living with father	2 (2.0)
Living with mother	7 (7.0)
Living with grand parents	2 (2.0)
Supplemental status	
Ferrous sulfate	27 (27.0)
Multivitamin	4 (4.0)
Acid folic	5 (5.0)
Ferrous and acid folic	16 (16.0)

Contd...

Table 2: Contd...

Variable	*n* (%)
None of them	47 (47.0)
Class degree	
Tenth	73 (73.0)
Eleventh	12 (12.0)
Twelfth	15 (15.0)

SD=Standard deviation

CI: −5.8 to −1.9; $P < 0.001$). Mean (SD) depression score in participants before the intervention was 17.0 (11.5) which immediately after the intervention dropped to 11.0 (10.4) (MD: −6.0, 95% CI: −8.3 to −3.8; $P < 0.001$) and 8 weeks after the end of the intervention, it was significantly reduced to 12.7 (11.0) (MD: −4.2, 95% CI: −6.8 to −1.6; $P < 0.001$) [Table 3].

Among the 100 participants before the intervention, according to the BAI, 41% had mild anxiety and 59% had moderate anxiety. Immediately after the intervention, 31% had no anxiety, 40% had mild anxiety, 19% had moderate anxiety, and 10% had severe anxiety. Eight weeks after the intervention, 36.4% had no anxiety, 32.3% had mild anxiety, 18.2% had moderate anxiety, and 13.1% had severe anxiety [Table 4].

There was no severe anxiety among the participants before entering the intervention; therefore, 13 patients with severe anxiety were re-followed up 2 months later. In their follow-up, people described the possible causes of their anxiety as follows: one person stated the infection of his mother with COVID-19 and shortly after, his grandmother's death as the causes of anxiety. One was in the process of divorcing her fiancé. One had a dispute with friends and one had trouble in the family, one was during English language examinations and six others did not give a specific reason, among whom three had unstable family or emotional status stating that sometimes, they get very anxious: one person mentioned his father's death and mother's role for working, another person mentioned a weak emotional connection with parents and one person due to parents' divorce lives with grandparents and away from other siblings and two were unavailable. A visit to a psychologist/psychiatrist was recommended for every 11 people.

The frequency of depression according to BDI was significantly reduced immediately after the intervention and over time [Table 5].

All 4 domains of quality of life increased significantly after the intervention compared to before.

Mean (SD) score of overall quality of life before the intervention was 67.2 (14.8) which increased significantly immediately after the intervention to 71.1 (16.3) (MD: 3.7, 95% CI: 1.8–5.9; $P < 0.001$) and 8 weeks later to 71.9 (14.6) (MD: 4.7, 95% CI: 2.3–7.1; $P < 0.001$) [Table 6].

Regarding physical health, the mean (SD) of the participants' score before the intervention was 70.4 (16.8), which immediately after the intervention increased significantly to 75.2 (16.3) and 8 weeks after the intervention to 76.3 (14.3) (MD: 5.9, 95% CI: 2.2–9.7; $P < 0.001$).

In the field of mental health mean (SD) of the participants' score before the intervention was 59.9 (19.1), which immediately after the intervention increased significantly to 64.3 (21.3) and 8 weeks after the intervention to 64.5 (19.4) (MD: 4.6 95% CI: 0.4–8.8; $P < 0.027$).

Regarding social relationships, mean (SD) of the score of the participants before the intervention was 64.6 (20.4), which immediately after the intervention increased significantly to 70.1 (22.5) and 8 weeks after the intervention to 67.1 (14.3) (MD: 2.5 95% CI: −1.7–6.6; $P < 0.243$), and in the field of environmental health, mean (SD) score of participants before the intervention was 69.3 (15.5) which immediately after the intervention increased significantly to 72.0 (17.3) and 8 weeks after the intervention to 74.6 (16.4) (MD: 5.4 95% CI: 2.5–8.2; $P < 0.001$) [Table 6].

Discussion

The results of this study indicate that counseling has been helpful on improving anxiety, depression, and life quality of female students with mild and moderate anxiety immediately and 2 months after the intervention.

Psychological inflexibility is defined as the inability to change effective behavior in the face of momentary stressors or environmental changes.[38] This inability to adapt to environmental changes may exacerbate stress, which could potentially contribute to the onset and maintenance of some psychological disorders, including depressive disorders and anxiety.[39] When anxiety is experienced in a flexible psychological state, it will have less effect on behavior.[40] Clients who receive ACT are able to start life meaningfully, because the goal of ACT is to create psychological flexibility in a way that enhances clients' ability to fully connect with the present and change or maintain behavior toward valuable goals.[21]

The findings of current study are consistent with other studies. For example, two pilot studies examined effect of a brief intervention based on the principles of ACT on depressive symptomatology (Australian study, $n = 66$) and stress (Swedish study, $n = 32$) among girl and boy adolescents screened for psychosocial problems in school settings. In both studies, participants were assigned to

Table 3: Anxiety and depression index of the participants

	Anxiety (BAI)	Depression (BDI)
Before intervention (1)/mean (SD)	16.7 (4.8)	17.0 (11.5)
After intervention (2)/mean (SD)	12.7 (9.3)	11.0 (10.4)
8 weeks after intervention (3)/mean (SD)	12.8 (8.7)	12.7 (11.0)
P; MD (95% CI)/(3)-(1)	<0.001; −3.9 (−5.8-−1.9)	<0.001; −4.2 (−6.8-−1.6)
P; MD (95% CI)/(2)-(1)	<0.001; −4.0 (−5.9-−2.0)	<0.001; −6.0 (−8.3-−3.8)
P; MD (95% CI)/(3)-(2)	0.999; 0.1 (−1.7-1.9)	0.052; 1.8 (−3.6-−0.009)
Total *P*	<0.001*	<0.001†

*Sphericity test for the effect of time ANOVA: Repeated measure, †Greenhouse-Geisser test for the effect of time ANOVA: Repeated measure, *P* (3)-(1), *P* (2)-(1), *P* (3)-(2): Repeated measure ANOVA: Pairwise comparison. BDI=Beck depression inventory II, BAI=Beck anxiety inventory-I, SD=Standard deviation, CI=Confidence interval, MD=Mean difference

Table 4: Frequency of anxiety screening in the study participants based on Beck depression inventory at different times

Anxiety	Before intervention, *n* (%)	After intervention, *n* (%)	8 weeks after intervention, *n* (%)	*P*‡
Absence or minimum (0-7)	0	31 (31.0)	36 (36.4)	<0.001
Mild (8-15)	41 (41.0)	40 (40.0)	32 (32.3)	
Moderate (16-25)	59 (59.0)	19 (19.0)	18 (18.2)	
Severe (26-63)	0	10 (10.0)	13 (13.1)	

‡Friedman test

Table 5: Frequency of depression screening in the study participants based on BAI at different times

Depression	Before intervention, *n* (%)	After intervention, *n* (%)	8 weeks after intervention, *n* (%)	*P*‡
Absence or minimum (0-10)	28 (28.0)	61 (61.0)	54 (54.6)	<0.001
Mild (11-20)	39 (39.0)	24 (24.0)	23 (23.2)	
Moderate (21-30)	21 (21.0)	8 (8.0)	14 (14.1)	
Severe (31 and more)	12 (12.0)	7 (7.0)	8 (8.1)	

‡Friedman test

receive the ACT-group intervention or a control group featuring individual support from the school health care.

The Swedish study used a randomized controlled design. Eligible participants were students aged 14–15 years in 10 classes in the participating school. Participants were 32 adolescents.

As with the Australia study, given the age of the participants, the program was conducted in single-sex groups and the majority of participants were female (males, $n = 9$).

The ACT intervention was an 8-session manualized group program. In the Swedish study, the ACT intervention group ($n = 11$) when compared to the control group ($n = 17$) reported significantly lower levels of stress with a large effect size, and marginally significant decrease of anxiety, and marginally significant increased mindfulness skills. The Australian study showed significant reductions in depressive symptoms with a large effect and significant reductions in psychological inflexibility with a medium effect when compared to the control group who received standard care. Consistent with the current study, the above study showed the effectiveness of the ACT approach in adolescents' anxiety and depression. The Australian study showed that on the primary outcome variable of depression (as measured by total score of RADS-2), there was greater improvement for those in the ACT group format, with a large effect size. The AFQ-Y is designed to measure key areas of ACT such as fusion and acceptance of negative thoughts and emotions. The Swedish study found no significant effects with this measure. This could be a problem with low power; a stronger replication with a larger sample size is needed to understand if it is a suitable process measure of change in the primary outcome measures.[30] In the Swedish study, chief physician of the schools in the county had chosen the school because of many reports of high levels of stress in this particular school but in the present study, schools were randomly selected from all parts of the city and had follow-ups were done 2 months later but this study had no control group.

A quasi-experimental research in Kashan conducted on 30 students with social anxiety disorder. The participants were randomly divided into an experimental and control group. The intervention group consisted of 13 female students with an average age of 17 and the control group consisted of 11 students with an average age 16 in the second and third grades of high school. The intervention group received 8 sessions of ACT. Results showed a significant improvement in the variable in the experimental group. Researchers stated that the

Table 6: Quality of life score and its dimensions in the participants before and after the intervention

Dimensions of life quality	Mean (SD)			MD (95% CI)/ mean 3-1	*P* (3-1)	*P* total[¥]
	Before intervention (1)	After intervention (2)	8 weeks after intervention (3)			
Physical health (0-100)	70.4 (16.8)	75.2 (16.3)	76.3 (14.3)	5.9 (2.2-9.7)	<0.001	<0.001*
Psychological (0-100)	59.1 (19.1)	64.3 (21.3)	64.5 (19.4)	4.6 (0.4-8.8)	0.027	0.004[†]
Social relation (0-100)	64.6 (20.4)	70.1 (22.5)	67.1 (22.7)	2.5 (−1.7-6.6)	0.243	0.017[†]
Environment (0-100)	69.3 (15.5)	72.0 (17.3)	74.6 (16.4)	5.4 (2.5-8.2)	<0.001	<0.001*
Total life quality (0-100)	67.2 (14.8)	71.1 (16.3)	71.9 (14.6)	4.7 (2.3-7.1)	<0.001	<0.001[†]
MD (95% CI)/mean 2-mean 1	-	-	-	3.7 (1.8-5.9)	<0.001	-
MD (95% CI)/mean 3-mean 2	-	-	-	0.8 (−1.2-2.8)	0.413	-

[¥]Sphericity test for repeated measure, *Sphericity test for the effect of time ANOVA: Repeated measure, [†]Greenhouse-Geisser test for the effect of time ANOVA: Repeated measure. *P* (3)-(1), *P* (2)-(1), *P* (3)-(2): Repeated measure ANOVA: Pairwise comparison. SD=Standard deviation, CI=Confidence interval, MD=Mean difference

students were taught that instead intellectual and practical avoidance of anxious thoughts and social situations, increase psychological and mental acceptance of inner experiences such as the thoughts and feelings that are present and spoken in the public and also cope with their disorder by creating more social goals and commitment to them. It was recommended that studies should be performed with larger sample sizes. There are differences between the current study and the above study in the counseling content and their participants who had social anxiety and also they did not have follow-up.[23]

Hayes *et al*. presented a pilot study that compared ACT (*n* = 22, female 18) with treatment as usual (TAU) (*n* = 16, female 9), using random allocation of participants who were clinically referred to a psychiatric outpatient service. Participants were 38 adolescents, aged averagely 14.9 with 73.6% in the clinical range for depression. At posttreatment and 3-month follow-up on measures of depression, participants in the ACT condition showed significantly greater improvement and 58% showed clinically reliable change in favor of ACT. They pointed out that outcomes from 3-month follow-up data are tentative due to small numbers.[24] The number of participants at follow-up in ACT group was 8 individuals; in TAU was 4 in this study. Both girls and boys participated in this study.

Toghiani *et al*. investigated the effectiveness of group ACT on social anxiety in 71 female dormitory residents in two groups. In their study, the intervention group received 5 counseling sessions, whereas the control group students were only offered a set of informative scientific nonpsychological brochures. Data analysis indicated the improvement of participants' social anxiety. Authors expressed these people with social anxiety need to lead that instead of cognitively and actively avoiding thoughts and situations leading to social anxiety, increased psychological flexibility regarding their internal experiences, they can accept their thoughts and emotions in social situations. Then, people can choose what is possible for them at the current moment and act in a way that fit their values. These characteristics are created during ACT and help people remove their need for avoidance through increased mindfulness, being in the present and better acceptance and commitment.[27]

Similar to the current study, they applied group ACT counseling to the participants and showed a significant improvement in social anxiety. In this study, participants were college students with social anxiety and they were chosen by convenient sampling. Their study had control group but no follow-up.

In a systematic review study, 709 patients with anxiety and depression have been examined. Results showed that group-based ACT has positive effects in the treatment of emotional disorders of varying severity in children, adolescents, and adults. However, while acknowledging the difficulties inherent to clinical investigation, the majority of the studies have only modest samples, sometimes taken from specific populations or the result of convenience sampling, which compromises, at least in part, any generalization of the results. In all studies, the principal objective of ACT intervention is to increase psychological flexibility and actions committed to personal values, using therapeutic strategies characteristic of this contextual therapy.[31]

People often avoid anxious thoughts, feelings, and actions when they experience them, and instead of improving them, they make the situation worse. In the present study, people were asked instead of avoiding or trying to control anxious thoughts and feelings, accept them by recalling the metaphor of the person in the pit[37] and then, by doing mindfulness exercises such as relaxation exercises and counting the number of breaths, learn to be constantly in the present at certain times of the day, and perform appropriate behaviors at every moment[21] by remembering the metaphor of chessboard, they comprehend themselves as self-concept and see their thoughts as only a part of themselves. That is, just their thoughts no whole of them and their identity is different from their thoughts. By separating from these thoughts, at the same time having these thoughts and feelings, they are committed to pursuing their valuable goals in life.[37]

One of the limitations of the project was the lack of a control group and the low number of counseling sessions (6 sessions) due to the limited time of schools because students were only present when the schools were open, although all content was presented in these 6 sessions, and the sessions were arranged so that they did not coincide with the examination time.

Conclusions

According to the effectiveness of counseling based on ACT on anxiety and depression, and quality of life in students with the mild and moderate anxiety over time after ending the intervention, it can be used as a helpful method in promotion of mental health in female students in high schools. However, it is recommended to investigate the long-term effects of this approach.

Acknowledgments

All students participating in the study, principals of the schools, and officials of the five education districts are thanked for their cooperation in conducting this study.

Financial support and sponsorship

This study is financially supported by the Vice-Chancellor for Research and Technology of Tabriz University of Medical Sciences in the form of an MSc dissertation (Grant number: 62904) (Code: IR.TBZMED.REC.1398.310). The investor had no role in designing the study, collecting data, and analyzing or producing the manuscripts.

Conflicts of interest

There are no conflicts of interest.

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