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The Impact of Acceptance and Commitment Therapy on Trauma and Psychological Flexibility among University Students Affected by the Earthquake

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Abstract

This study aims to examine the impact of Acceptance and Commitment Therapy (ACT) on the trauma levels and psychological flexibility of university students affected by the earthquake. The study included a total of 30 participants. Participants in the research were divided into two groups, an experimental group and a control group, using the stratified random sampling method. In the experimental group, there were 8 males (53.3%) and 7 females (46.7%) aged between 18-30 (M = 23.26; SD = 3.19). Similarly, in the control group, there were 8 males (53.3%) and 7 females (46.7%) aged between 18-30 (M = 23.33; SD = 3.47). The study employed a true experimental design and a 2x2 split-plot the randomized pre-test post-test control group design. The instruments used for data collection were the Post-Earthquake Trauma Level Determination Scale and the Multidimensional Psychological Flexibility Inventory. The experimental group received a 6-week ACT intervention, while no intervention was applied to the control group. In data analysis, paired-sample t-tests, independent samples t-tests, and Pearson correlation analysis were conducted using IBM SPSS 26.0 software. The research found that ACT intervention reduces the impact of earthquake related trauma and enhances psychological flexibility. Additionally, a negative correlation has been observed between earthquake induced trauma and psychological flexibility.

Keyword: *Acceptance and Commitment Therapy, Psychological Flexibility, Posttraumatic Stress Diserder , Acut Stress Disorder, Post-Earthquake Psychology,*

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Introduction

Each day, various regions around the world witness the occurrence of diverse disasters or calamities, whether natural or anthropogenic in origin. Natural disasters are defined as rapid, sudden, and extreme events within the geophysical system that surpass the response and recovery capacities of the affected area, leading to harms such as injuries and fatalities among the inhabitants, as well as material damages (1-3). The early detection of potential psychiatric issues in the aftermath of a disaster has been emphasized in the literature as crucial for initiating relief efforts and examining the impacts of the disaster (3). Throughout its history, Turkey has confronted numerous significant earthquakes. The earthquakes that occurred in 1939 and 1999 left deep scars in collective memory due to the substantial loss of life they caused. However, the earthquake on February 6, 2023, surpassed these previous seismic events in both scale of destruction and loss of life, thus securing a distinct place in the national memory. This catastrophe once again highlighted the seismic vulnerability of Turkey, emphasizing the precarious nature of its seismic activity.

The earthquakes that occurred on February 6, 2023, were centered in the Pazarcık and Elbistan districts of Kahramanmaraş province, with magnitudes of Mw 7.7 and Mw 7.6, respectively. Additionally, on February 20, 2023, a seismic event with a magnitude of Mw 6.4 took place in the Yayladağı district of Hatay province. Considering the proximity of Gaziantep province to the epicenters of the earthquakes that occurred on February 6, 2023, and February 20, 2023, it ranks among the severely affected provinces by the seismic events (4).

The psychological effects of earthquakes, which can turn into a devastating disaster, persist for years (5, 6). Exposure to a disaster leads to Posttraumatic Stress Disorder (PTSD) in 30-40% of individuals (7). According to psychological research on disasters, these events have significant impacts on issues related to alcohol and substance use, psychosomatic illnesses, depression, generalized anxiety disorders, PTSD, suicidal thoughts, increased domestic stress and violence, as well as aggression and violence (8-14).

Examining other earthquakes that have occurred, significant natural disasters in Haiti and Japan have left profound marks on the psychological well-being of affected individuals. The traumatic effects that emerge in the aftermath of such disasters, disrupting people's lives, can lead to the development of psychological disorders such as PTSD. The formation of PTSD is associated with the intensity and continuity of challenging experiences endured by individuals who survive disasters (15).

Considering the profound and long-term effects of disasters on human psychology, it is essential to recognize that PTSD is not the sole outcome of trauma, although it is acknowledged as the most commonly encountered psychological disturbance. Studies indicate that the prevalence of PTSD among disaster survivors hovers around approximately 30%, emphasizing that PTSD develops as a direct consequence of exposure to traumatic events. It is underscored that addressing PTSD should not only involve tackling other psychological problems triggered by trauma but also acknowledging that it is not the exclusive result of traumatic experiences. Facilitating the coping mechanisms of individuals affected by disasters and their negative consequences

contributes to fostering positive transformation in these individuals (14).

When examining the literature, studies have demonstrated the long-term psychological effects of disasters. Limited research conducted in Turkey has indicated that the lifetime prevalence of PTSD among individuals after earthquakes is approximately 14.6% (16,17). According to numerous studies, it has been observed that even if the severity of an earthquake is not exceptionally high, its psychological consequences such as PTSD and major depression can have serious and enduring effects, that persisting for years (3, 18-21). The term "trauma" is employed to denote any experience that profoundly disrupts, harms, and injures an individual's psychology and physiological integrity. Stress, on the other hand, refers to any external or internal factor that can disrupt the organism's balance, altering its homeostatic state (22). Trauma is associated with unexpected and sudden events that individuals or those close to them encounter, which may result in death or lead to serious injuries (23-24).

Acceptance and Commitment Therapy (ACT) is a therapy approach that aims to strengthen the psychological flexibility of the individual through the processes of contact with the present moment, acceptance, living by acting in line with their values, and changing their behavior in this direction (25). Psychological flexibility is associated with six processes: contact with the present moment, acceptance, cognitive defusion, self as context, values, and committed action (26). Self-compassion, although not formally integrated as a component of the ACT process model, is being examined by ACT practitioners and researchers to explore its role in psychotherapy (27). Therapeutic approaches that encompass the six processes of ACT and components of self-compassion are reported to be effective in enhancing psychological flexibility in university students (28). Studies have found that ACT increases psychological flexibility in university students and that the effect continues in the long-term (28-35).

ACT emerges as an effective approach in trauma treatment. Individuals diagnosed with PTSD may struggle continuously with traumatic memories, unwanted thoughts, and nightmares. This situation, coupled with avoidance tendencies, emotional difficulties, and efforts to cope with the effects of trauma, can lead the individual to perceive themselves as "damaged" or "broken." The ACT approach focuses on individuals confronting their challenging experiences and accepting them as valuable components of a meaningful life. By directly experiencing and acknowledging distressing memories and emotions, ACT aids individuals in assigning meaning and coherence to the experiences associated with trauma. Professional intervention aims to guide individuals with posttraumatic experiences toward the process of healing (36).

The literature indicates that the use of ACT in the treatment process of individuals with a history of trauma yields positive results in research studies. Therefore, it is considered that ACT is a highly suitable therapeutic approach in the treatment of individuals with a history of trauma (37-42). Furthermore, in a study where ACT was applied to individuals affected by a natural disaster, it was found that individuals' psychological resilience increased (43).

The aim of this research is to examine the impact of ACT on the trauma levels and psychological flexibility of university students affected by an earthquake, with the

objective of assessing the effectiveness of ACT in facilitating individuals' acquisition of trauma resilience and psychological flexibility.

Materials and Methods

The research was designed as an experimental study using a quantitative method to investigate the impact of ACT intervention on the trauma levels and psychological flexibility of university students affected by the earthquake. In this study, the experimental model used was the true experimental research design, and a 2x2 split-plot design was employed. The randomized pre-test post-test control group design has a related design nature due to the dependent variable being measured twice on the same individuals and an unrelated design nature due to the comparison of measurements between different participants in the experimental and control groups (44). This research has been approved by the Ethics Committee of Istanbul Nisantasi University.

In Gaziantep province, a total of 15 experimental and 15 control groups were formed from university students aged 18-30 affected by the earthquake on February 6, 2023, using the stratified random sampling method. Both the experimental and control groups consisted of 8 males and 7 females each. To participate in the research, participants were required to meet the following criteria: not having a psychiatric illness, not undergoing psychiatric treatment or using psychiatric medication, not having a history or thoughts of suicide, not experiencing the destruction of their home or the loss of a first-degree relative in the earthquake, and ensuring that their scores on the Post-Earthquake Trauma Level Determination Scale (PETLDS) were above 52. Score of the PETLDS obtained from the scale were examined using a two stage clustering analysis known as Two-Step Cluster, and individuals' post-earthquake trauma scores were determined. Furthermore, The score obtained from the PETLDS, within the range of 52.385 ± 5.051 points, indicates that an individual assessed with this scale is traumatized. Scores above this threshold indicate high levels of traumatization, while scores below suggest low levels of traumatization (45). The desired score criterion for inclusion in the research was determined with reference to this score. Eight participants who volunteered to participate but did not meet the inclusion criteria were excluded from the study at the beginning of the research.

In this research, the demographic information form, the PETLDS, and the Multidimensional Psychological Flexibility Inventory (MPFI) scales were utilized.

I n this study, the Post-Earthquake Trauma Level Determination Scale (PETLDS), developed by Tanhan and Kayri (45), was utilized to measure participants' trauma levels after the earthquake. A validity and reliability study was conducted for PETLDS. These items are on a 5 point likert scale, rated from the lowest “Strongly Disagree” to the highest “Strongly Agree”. The result of the reliability analysis conducted for the scale showed an internal consistency coefficient Cronbach's alpha of 0.87. The goodness of fit for this model was obtained as follows: RMSEA 0.000, NFI 0.88, GFI 0.94, RMR 0.080, and AGFI 0.92.

In the study, the MPFI, developed by Rolffs and colleagues (46), and adapted into Turkish by Ulubay (47) to suit the Turkish language and culture, was used to measure participants' levels of psychological flexibility. The results of the reliability analysis for the scale are as follows:

Cronbach's alpha coefficient for internal consistency is 0.95, Spearman Brown coefficient for the equivalent halves method is 0.90, Guttman Split-Half coefficient is 0.90, and the test-retest correlation conducted with a 3-week interval is 0.94.

Thirteen weeks after the earthquake, a pre-test was administered to the participants. Following an individual interview with each participant, a total of six online sessions were conducted, once a week. Each session lasted for 60 minutes. Subsequently, a post-test was administered. Throughout this research process, no client has discontinued psychotherapy, and there has been no situation leading to the premature termination of psychotherapy.

The studies conducted in the intervention of ACT have been prepared with the following topics and process: Defining the mind in the ACT approach and explaining the relationships established by the mind; understanding the client's emotions, thoughts, physical sensations, and values with the ACT Matrix, functional analysis, verbal aikido, distinguishing short-term goals from long-term values and relevant metaphors, and exercises; implementation of creative hopelessness; practicing present moment awareness, doing exercises in the here and now; implementation of defusion, exercises for defusion; implementation of acceptance and relevant metaphors, and exercises; implementation of self-compassion and perspective taking; self as context and observing self, self-assessments, differences between mind and self and relevant metaphors, and exercises; recognizing and clarifying values, determining values with exercises; committed action to values and relevant metaphors.

This research was limited to university students in the 18-30 age range who experienced the earthquake in the Gaziantep province. Information about the participants in this study is limited to the questions of the PETLDS and MPFI scales and the Sociodemographic Information Form prepared by the researcher. The data obtained in the research are limited to the values measured by the scales. This study assumes that participants responded sincerely and impartially to the measurement tools.

For data analysis, IBM SPSS 26.0 software was utilized. Matched pairs t-test was employed to compare the psychological flexibility dimensions and post-earthquake traumatic stress scores of participants in the experimental and control groups. Additionally, independent samples t-test was conducted to compare the psychological flexibility and post-earthquake traumatic stress scores between the experimental and control groups. Furthermore, Pearson Correlation was applied to examine the relationship between the psychological flexibility and post-earthquake traumatic stress scores of the experimental and control groups. When deciding which tests to apply in the study, skewness and kurtosis values of the sub-dimensions and total scores for both the experimental and control groups were checked. Since skewness and kurtosis values were between -3 and +3, it was assumed that the data had a normal distribution (48). Therefore, parametric measurements were deemed appropriate.

Results

The paired-sample t-test results for examining the differences in post-earthquake traumatic stress and psychological flexibility scores of the experimental group are presented in Table 1.

Tablo 1. Matched Sample T-Test Results for the Pre-Measurement and Post-Measurement Score Differences of the Experimental Group

		Matched Differences					
		$\bar{x}$	Ss	SH_M	t	sd	p
Pair 1	PETLDS Pre-Measurement - PETLDS Post-Measurement	31.733	9.262	2.391	13.270	14	<.000***
Pair 2	MPFI Pre-Measurement - MPFI Post-Measurement	-129.267	10.082	2.603	-49.660	14	<.000***
Pair 3	Acceptance Pre-Measurement - Acceptance Post-Measurement	-14.667	2.690	.695	-21.114	14	<.000***
Pair 4	Present Moment Pre-Measurement - Present Moment Post-Measurement	-24.667	2.845	.735	-33.577	14	<.000***
Pair 5	Self as Context Pre-Measurement - Self as Context Post-Measurement	-20.733	2.463	.636	-32.602	14	<.000***
Pair 6	Defusion Pre-Measurement - Defusion Post-Measurement	-25.800	4.144	1.070	-24.114	14	<.000***
Pair 7	Values Pre-Measurement - Values Post-Measurement	-20.867	3.182	.822	-25.400	14	<.000***
Pair 8	Committed Action Pre-Measurement - Committed Action Post-Measurement	-22.533	4.357	1.125	-20.031	14	<.000***

In the experiment group, Traumatic stress levels was significantly lower in the post-measurement compared to the pre-measurement (t=13.270; p<.001). Psychological flexibility post-measurement scores were found to be significantly higher than pre-measurement scores (t=-48.660; p<.001). It was also found that all sub-dimensions of psychological flexibility (acceptance, present moment, self as context, defusion, values, committed action) had significantly higher post-measurement scores compared to pre-measurement scores (respectively t=-21.114; p<.001, t=-33.577; p<.001, t=-32.602; p<.001, t=-24.114; p<.001, t=-25.400; p<.001, t=-20.031; p<.001). When the differences between the pre-measurement and post-measurement scores of the control and experimental groups are compared, it is observed that the score difference in the experimental group is higher than that of the control group.

Table 2. Pearson Correlation Findings for the Examination of the Relationship Between the Post-Measurement Scores of the Experimental Group

		PETLDS Post-Measurement
MPFI Post-Measurement	r	-.516*
	p	.049
	N	15

According to the Pearson Correlation findings in Table 2, the relationship between the post-measurement scores of the experimental group indicates a significant negative correlation between post-earthquake trauma levels and psychological flexibility total score (r=-.52; p<0.01).

Table 3. Independent Samples T-Test for the Comparison of Post-Measurement Scores between Experimental and Control Groups

	groups	N	x̄	Ss	t	p
PETLDS Post-Measurement	experimental	15	37.53	3.925	-7.792	<.001***
	control	15	58.27	9.528		
MPFI Post-Measurement	experimental	15	269.13	13.731	22.645	<.001***
	control	15	159.40	12.794		
Acceptance Post-Measurement	experimental	15	28.33	1.447	21.239	<.001***
	control	15	15.47	1.846		
Present Moment Post-Measurement	experimental	15	49.53	3.758	15.610	<.001***
	control	15	29.40	3.291		
Self as Context Post-Measurement	experimental	15	41.73	3.240	15.261	<.001***
	control	15	23.53	3.292		
Defusion Post-Measurement	experimental	15	49.00	3.566	13.161	<.001***
	control	15	27.13	5.357		
Values Post-Measurement	experimental	15	50.27	3.826	11.684	<.001***
	control	15	32.80	4.346		
Committed Action Post-Measurement	experimental	15	50.27	3.327	14.128	<.001***
	control	15	31.07	4.079		

According to the independent samples t-test results comparing the total and sub-dimension scores of psychological flexibility, and the post-earthquake trauma level post-measurement scores between the experimental and control groups in Table 3, the post-earthquake trauma level ($t=-7.79$; $p<0.001$) was found to be significantly higher in the control group. Additionally, the psychological flexibility post-measurement total score ($t=22.64$; $p<0.001$) and all subdimension (acceptance, present moment, self as context, defusion, values, committed action) scores (respectively $t=21.24$; $p<0.001$, $t=15.61$; $p<0.001$, $t=15.26$; $p<0.001$, $t=13.16$; $p<0.001$, $t=11.68$; $p<0.001$, $t=14.12$; $p<0.001$) were significantly higher in the experimental group. According to the findings, acceptance and commitment therapy applied to the experimental group had an impact on increasing psychological flexibility scores and decreasing post-earthquake trauma levels.

Discussion

According to the findings of the study, in the post-measurement, the trauma level of the experimental group, which received ACT, is lower than that of the control group. Additionally, the amount of reduction in trauma level exhibited by the experimental group is greater than the reduction observed in the trauma level of the control group.

It is observed that in the post-measurement, the psychological flexibility level of the experimental group, which received ACT, is higher than that of the control group. Additionally, the increase in psychological flexibility shown by the experimental group is greater than the increase observed in the psychological flexibility of the control group. Moreover, the applied ACT to the experimental group has influenced both the increase in the total score of psychological flexibility and the increase in the scores of the 6 subdimensions of psychological flexibility. Futhermore, it is observed that both the control and experimental groups have experienced a reduction in their traumas at the end of this 6-week process. However, while there is a smaller decrease in the control group, there is a larger decrease in the trauma level of the experimental group. Similarly, although psychological flexibility increases in both groups, there is a greater increase in the experimental group. These findings suggest that the passage of time may have a small impact on reducing trauma, albeit not as significant as ACT. Additionally, it is noteworthy that during this period of reduced trauma, there is an increase in psychological flexibility. In the experimental group, a negative correlation between trauma and psychological flexibility was found in the final test.

The findings regarding the increase in psychological flexibility and the reduction of trauma levels through ACT obtained from the study are consistent with other research in the literature we cannot for see the sustainability of these results from this research alone. (28-35, 37-42, 49). Although pre-tests and post-tests were conducted in the study, no follow up test was administered after the termination of therapy to assess whether there were any changes in individuals' conditions. Future research could gain insights into the sustainability of ACT's effectiveness by implementing follow up tests after some time has passed since therapy termination. In this context, in a study conducted by Yapan, Murat and Yavuz, findings were obtained from follow up measures conducted one month and three months

after the application of an ACT based psychoeducation program (50). The results indicated a decrease in test anxiety and an increase in cognitive defusion and acceptance in individuals after ACT intervention. This improvement persisted in the period following the completion of the ACT intervention. This outcome suggests that the impact of ACT intervention may endure in the postintervention period.

In a study, participants stated that they enjoyed the ACT process. Additionally, unlike CBT, participants did not terminate therapy prematurely in the ACT process. Researchers have mentioned that individuals are more likely to stick to a therapy they enjoy (51). Consistent with the mentioned study, in this research, no participant in the ACT process terminated therapy early, and the process was completed with all participants as planned.

In a study conducted by Larsson, Hartley and McHugh, a web based self help intervention covering the aspects of contact with the present moment, cognitive defusion, and self as context was applied to university students without psychiatric diagnoses, with a 3-week follow up (30). Although this intervention was found to have beneficial effects on individuals' psychological well-being, it was observed that it did not have a significant impact on depression, anxiety, and stress symptoms compared to the control group. Researchers attributed this situation to the intervention program not covering all processes. Considering the findings of their study, which did not cover all processes, and the findings of this study, which took care to cover all processes, comparisons can be made in future studies between self help programs covering all processes and therapist led ACT interventions. This way, the effectiveness of self help programs at various points can be addressed. Additionally, compared to ACT application, areas where ACT application may fall short can be identified, and the feasibility of implementing a self help program for exercises after ACT sessions can be explored.

The participants included in the study were individuals who did not experience the loss of first-degree family members and whose homes were not destroyed due to the earthquake. Although the participants consisted of individuals who were significantly affected by the earthquake (having experienced the loss of acquaintances who were not first-degree family members, being forced to leave home, witnessing the destruction of other people's homes, etc.), there is a possibility that they may not have been as traumatized as individuals whose homes were destroyed and had first-degree family losses. The importance of this information about the participants lies in the fact that the earthquake related destruction and damage experienced by individuals affected by the earthquake are directly proportional to PTSD and depressive symptoms (10). On the other hand, based on the findings obtained from the PETLDS used in this study, we know that all participants were individuals with high levels of post-earthquake trauma. The fact that the participants had experienced the earthquake and were traumatized is one of the aspects that makes this study strong. In addition to this situation, in the study, the trauma levels of the control group were lower, and conversely, their psychological flexibility was higher in the pre-measurements compared to the experimental group. However, according to both the post-earthquake trauma levels and psychological flexibility results, both groups consisted of

individuals with high trauma levels and low psychological flexibility. The sample selection in the study was made through a random stratified sampling method, and this difference between the two groups did not pose a problem in the study since it was not significant.

The researcher observed that participants had difficulty coping with earthquake-related stress factors in the post-earthquake period rather than during the earthquake itself during the ACT application process. Participants expressed a preference for focusing on the post-earthquake experiences rather than delving into matters pertaining to the moment of the earthquake. Furthermore, their lived fusion-like experiences were largely unrelated to the earthquake moment but instead centered around the challenges they faced and the struggles they endured in the aftermath of the earthquake. Perhaps the fact that participants were not individuals stranded beneath the earthquake-ravaged house may have contributed to this situation. However, in this study, it was still observed that post-earthquake problems caused by the earthquake had a more significant impact on individuals than the impact of the earthquake itself.

Individuals having pre-existing symptoms related to psychological issues before the earthquake may have fewer resources to cope with the difficulties arising after the earthquake (10). This situation could lead to the inclusion of another external variable in the research. Due to the unpredictability of the earthquake, participants were not assessed for pre-earthquake symptoms. However, the inclusion criteria for participants, such as the absence of a psychiatric diagnosis, no history or thoughts of suicide, and not using psychiatric medication, helped control this to some extent.

In this study, regular conversations were held with the experimental group during the ACT intervention process, while no such conversations took place with the control group. The possibility that simply having conversations may have made a difference in the experimental group compared to the control group is conceivable. Pennebaker suggests that talking with people can have positive effects on their health, focusing more on physical health measures than primary outcome criteria for psychological health (52). According to Nolen-Hoeksema and Morrow, talking about the earthquake with someone (such as friends) alone has neither benefits nor harms (10). Researchers stated that people tend to talk about the earthquake continuously after it happened, are eager to talk, and therefore, individuals do not have difficulty finding someone to talk to about it. In this context, the lack of a noticeable effect of conversation alone and the opportunity for the control group to find someone to talk to about it indicate that this situation is not a problem for the study. However, in future research, a control group could be established where individuals talk about the earthquake in a social environment but without including a therapy like intervention.

Our findigs from this research provided us with further insight into the impact of ACT on the trauma levels and psychological flexibility of individuals affected by the earthquake, allowing us to anticipate the applicability of this therapy to other trauma situations. These anticipations may open new avenues for studies in this field. Our research results gave us new insight about the development of effective treatment methods for reducing trauma levels and

increasing psychological flexibility in individuals affected by earthquakes. Additionally, there is limited research on the use of ACT with individuals affected by earthquakes in the literature. With this study we took a step towards addressing this research gap and guiding future studies.

The effectiveness of ACT in the treatment of trauma-related psychological disorders, such as PTSD, was assessed. Additionally, the psychological flexibility levels of individuals with these conditions were evaluated. The results obtained from this research may contribute to the broader dissemination of this method. Furthermore, this research may pioneer studies on how ACT can be more effectively applied to individuals who have experienced earthquake trauma, exploring which stages of therapy are more beneficial for individuals.

Conclusion

This research demonstrates that ACT intervention reduces the trauma levels of university students affected by the earthquake and increases their level of psychological flexibility. Therefore, the use of ACT in working with earthquake trauma has been suggested. Additionally, this study shows that ACT enhances psychological flexibility and that psychological flexibility is effective in coping with trauma. In light of all these findings, it can be predicted that when psychological flexibility increases, trauma levels decrease, and ACT positively affects trauma survivors by enhancing psychological flexibility. In this context, it is assumed that this research will make valuable contributions to both therapeutic practice and individuals in need of posttraumatic psychological support.

Conflict of Interests

The authors declare that there are no actual or potential conflicts of interest. They affirm their independence from any sponsors, emphasizing that the content of the article has not been influenced by any sponsorship.

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