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Comparison of the effectiveness of acceptance and commitment therapy and cognitive-behavioral therapy on suppressed anger and self-compassion in women with chronic pain disorder

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Original Article

Abstract

BACKGROUND: Chronic pain means having pain for a long time. It lasts longer than the expected recovery time or happens with a long-lasting health problem. The study aimed to compare the effectiveness of acceptance and commitment therapy (ACT) and cognitive-behavioral therapy (CBT) on women with chronic pain disorder.

METHODS: This quasi-experimental study was conducted with a pretest-posttest control design and a one-month follow-up. The statistical population of this research included all women suffering from chronic pain disorder in Tehran City, Iran, from July to October 2022-2023. 60 participants were selected using purposive sampling and randomly assigned into two experimental groups and one control group (n = 20 women per group). The first experimental group received ACT (eleventh 90-minute sessions per week), the second experimental group received CBT (eight 90-minute sessions per week), while the control group was on the waiting list. The research instruments included the State-Trait Anger Expression Inventory-2 (STAXI-2) and the Self-Compassion Scale-Short Form (SCS-SF), which were administered before and after the intervention. The collected data were analyzed by the repeated measures analysis of variance (ANOVA) in SPSS software.

RESULTS: ACT and CBT significantly influenced the suppressed anger and enhanced self-compassion of women with chronic pain ($P < 0.001$).

CONCLUSION: Findings have shown that ACT and CBT have a positive effect on decreased suppressed anger and enhanced self-compassion in women with chronic pain. Therefore, ACT and CBT methods should be used in special counseling for women with chronic pain in the hospital.

KEYWORDS: Acceptance and Commitment Therapy; Cognitive-Behavioral Therapy; Suppressed Anger; Self-Compassion; Women; Chronic Pain Disorder

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Introduction

Chronic pain is a severe health problem with high incidence and a profound impact on individuals' physical functions, mental health, and economic well-being. It poses a significant burden on society.[1] Research conducted in Iran reported a prevalence of ongoing chronic pain in the general population (18-65 years) of 9% to

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21%.[2] People with chronic pain may find it hard to do everyday tasks, which impacts their job, social life, and sleep. They might also have difficulty with feeling sad, worried, and isolated.[3] Studies have shown that women with chronic pain have more avoidance and helplessness behaviors than men.[4] Mounting evidence shows that anger is a salient component of the emotional experience of chronic pain.[5] Exaggerated anger expression, as well as, at the opposite extreme, excessive anger suppression, may be detrimental to navigating our interpersonal world and can be associated with adverse interpersonal outcomes and psychological disorders.[6] Individuals with high levels of anger refrain from the free expression of anger, which is inhibited and suppressed.[7] A study reported that 70% of individuals with chronic pain experienced anger. Researchers found that the suppressed feelings of anger accounted for a significant portion of the variance in pain intensity, perceived interference, and frequency of pain behaviors.[8] These preliminary investigations have focused primarily on the intensity and expression of anger in patients with chronic pain.[4] In another study, Laws concluded that patients with chronic pain were less willing to express anger compared to outpatient medical patients.[9]

One of the effective factors in anger control is self-compassion.[10] Self-compassion involves caring and compassion for oneself in the face of difficulties and perceived inadequacies.[11] Self-compassion can improve mental health and enable individuals to develop aspects of prosocial motivation such as forgiveness. It is associated with forgiveness.[12] In people with chronic illnesses, self-compassion is consistently associated with more adaptive outcomes, including less shame, fewer health-threatening behaviors, and less functional impairment.[13] Therefore, self-compassion is the ability to respond to one's failures, shortcomings, and difficulties with kindness and openness rather than criticism.[14] Moreover, studies have revealed that self-compassion is connected to improved health and function in many chronic illnesses.[15]

There are different therapeutic approaches to treating patients with chronic pain, including drug therapy, surgery, local injections, psychotherapy, physical therapy, and others.[16] Dixon et al. proposed and developed acceptance and commitment therapy (ACT) and first used it.[17] Since then, more researchers have explored the topic, showing ACT's effectiveness in treating various mental disorders including anxiety and depression, chronic pain, cancer, eating disorders, insomnia, sleep quality, and rheumatic disorders.[18] Moreover, cognitive-behavioral therapy (CBT) is a widely accepted psychosocial treatment for chronic pain that is cost-effective and at least as efficacious as medically based treatments.[19] Positive outcomes of CBT include restoration of function mood, pain reduction, and pain interference.[2] In the last two decades, CBT has emerged as the most common approach to anger management.[20] Regarding the effectiveness of CBT on anger control, research results show that this treatment is effective in controlling anger, reducing anger, and suppressing it.[21]

The research gap in this study was the uncertainty about more effective treatment to help relieve repressed anger and increase self-compassion, which led the researchers to comparing the effectiveness of the two approaches, ACT and CBT, for the variables mentioned in this sample. Therefore, comparing the two treatments and the variables studied in this sample is an innovation. Thus, the study aimed to investigate the impact of ACT and CBT on the ability of women with chronic pain disorders to suppress anger and enhance self-compassion.

Methods

This quasi-experimental study was conducted

with a pretest-posttest control design and a one-month follow-up. The statistical population of this research included all women suffering from chronic pain disorder in Tehran City, Iran, from July to October 2022-2023. The statistical sample consisted of 60 participants who were selected using purposive sampling and randomly (using a table of random numbers) assigned into two experimental groups and one control group (20 women per group). For the random assignment, based on the table of random numbers, 40 women were randomly assigned to the experimental group and 20 women to the control group. After this, the women in the experimental groups were again randomly divided into ACT and CBT groups. Adequacy of sample size was confirmed through G*Power software ($\alpha = 0.05$, effect size = 1.11, and test power = 0.90).[22] Based on this formula in G*Power software, the researcher reached a sample size of 26 people in each group. With the possible drop in the sample size due to non-completion of questionnaires or non-participation in more than two sessions, the researcher considered the number of 20 people for each group. The inclusion criteria were women of 20 years of age and up, having physical and mental health to attend the intervention sessions, and having a medical record for chronic pain conditions. The exclusion criteria were having any psychological disorder, taking psychiatric drugs, and insufficient attendance at therapy sessions for over two sessions absence may cause withdrawal from the study and continuation of the treatment.

For conducting the study, the authors referred to four hospitals in the 6th district of Tehran City (including Yase Sepid, Mehregan, Gandi, and Hajar). Among the patients, women with chronic pain were identified purposefully. After placing the necessary number of women with chronic pain, in an initial interview, the researcher briefed them on research objectives and ethical principles, answered their questions, and obtained their written consent. The participants were randomly assigned into three groups (ACT, CBT, and control). The ACT group received eleven 90-minute sessions every week, while the CBT group received eight 90-minute sessions per week. Based on their respective instructions, each experimental group received the relevant number of training sessions. In contrast, the control group did not receive any intervention and was put on a waiting list. At the end of the research, an intensive course of ACT and CBT sessions was provided to the control group. Tables 1 and 2 present the summary of treatment sessions for the ACT and CBT groups, respectively.[18,23] At the end of the final session, the experimental groups answered the research questionnaires as a post-test.

Table 1. A summary of acceptance and commitment therapy (ACT) sessions

Session	Content
First	Briefing and introduction
Second	Introducing the concept of creative helplessness, and the hungry tiger metaphor
Third	Continuing creative hopelessness, fighting the monster metaphor
Fourth	Control is the problem, the polygraph metaphor
Fifth	Control is the problem, the two scales metaphor, the key to fight and pure emotions against impure ones
Sixth	Control is the problem, the chocolate cake metaphor, mindfulness with mindful breathing exercises
Seventh	Detachment from unpleasant thoughts and feelings, the numbers metaphor, the passengers on the bus metaphor
Eighth	Detachment, willingness and acceptance, the lion metaphor, the soldiers in the parade exercise, mindfulness exercises
Ninth	Detachment, self as context, the tombstone exercise, relationship between goals and values
Tenth	Evaluation of values, self as context, the chessboard metaphor, clarification of the values, and commitment
Eleventh	Review and summing up

Table 2. A summary of cognitive-behavioral therapy (CBT) sessions

Session	Content
First	An introduction to psychological training and identifying emotions and emotional adjustment skills, introducing and explaining the basic principles of CBT, introducing the basic concepts of CBT including spontaneous thoughts and cognitive errors, setting the schedule of sessions, discussing the rules of sessions
Second	Determining the session's agenda, evaluating, formulating, and providing a conceptual framework about the participant, conceptualizing the participant's issues, filling out the formulation worksheet, and starting relaxation or self-soothing skills
Third	Introduction to the relationship between thoughts, feelings, and behaviors and setting the meeting agenda, setting goals and setting treatment goals with the help of the patient, preparing notebooks for treatment, activity planning
Fourth	Reviewing coping skills, setting the meeting agenda, identifying and recognizing spontaneous thoughts, practicing recording thoughts, and assigning them to the patient as homework
Fifth	Determining the meeting agenda, changing and correcting spontaneous thoughts, teaching the technique of replacing logical thoughts, and introducing the weekly activity registration form as homework
Sixth	Determining the agenda of the meeting, identifying cognitive errors, examining evidence, and preparing confrontation cards
Seventh	Determining the agenda of the meeting, designing the graded task, and using the visual confrontation technique
Eighth	Review of unfinished activities, homework, and treatment notebook, answering to patient's questions, and summary

CBT: Cognitive-behavioral therapy

The Consolidated Standards of Reporting Trials (CONSORT) flow diagram is shown in figure 1. It is necessary to mention that permission to conduct the research was obtained from the ethics committee of the Payame Noor University (IR.PNU.REC.1401.231). Moreover, to comply with ethical principles, after conducting the research, interventions were also made for the control group. Before the implementation of the questionnaires, a willingness to cooperate form was taken from the research participants and there was no obligation to participate in the research and continue it. They were told that participation in the study was completely voluntary and that they could withdraw from the study at any time.

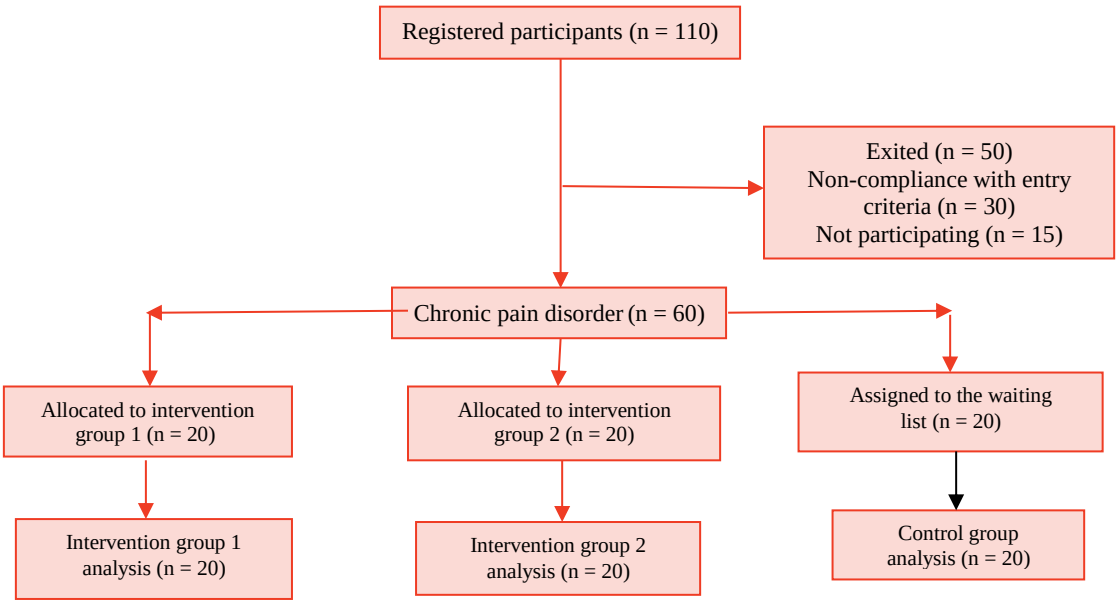

Figure 1. Flow diagram of the study

It was also explained to them that these tests did not contain identity information.

This study employed descriptive measures such as mean and standard deviation (SD) for descriptive statistics and analysis of covariance (ANCOVA) for inferential statistics. The collected data were analyzed with Kruskal-Wallis H, analysis of variance (ANOVA), and multivariate ANCOVA (MANCOVA) at a significance level of 0.05, and SPSS software (version 27, IBM Corporation, Armonk, NY, USA) was used for all statistical analyses. The Kolmogorov-Smirnov test was conducted to evaluate the normal distribution, and Levene's test was used to assess the homogeneity of variances. Bonferroni's post hoc test was also used to compare the means. SPSS 27 was used for data analysis.

State-Trait Anger Expression Inventory-2 (STAXI-2): For collecting data, Persian versions of Spielberger's STAXI-2 and addiction potential scale (APS) were employed. STAXI-2, designed by Spielberger and Odessa, has 57 items scored based on a 4-point Likert-type scale.[23] Items 1-15 measure state anger scale (feeling angry, feeling like expressing anger verbally, feeling like expressing anger physically) ranging from 1 = not at all to 4 = almost always, items 16-25 are related to the trait anger scale (angry temperament, angry reaction) ranging from 1 = rarely to 4 = almost always, and items 26-57 assess anger expression scale (anger expression-out, anger expression-in, anger control-out, and anger control-in) ranging from 1 = rarely to 4 = almost always. Its Persian version was designed by Zargar et al. according to the psychosocial aspects of Iranian society.[24] It has 41 items (5 of which are lie detectors) assessing two scales. The first scale is related to antisocial behaviors, tendency to use drugs, positive attitude toward drugs, depression, and sensation-seeking, while most items in the second scale are about non-assertiveness and depression. The scoring is based on a 3-point Likert-type scale ranging from 1 = disagree to 3 = agree. Acceptable construct validity (r = 0.45) and reliability (α = 0.90) have already been reported for its Persian version.[25] The Cronbach's alpha coefficient of the questionnaire was 0.83.

Self-Compassion Scale (SCS): This 26-item scale was developed by Neff.[25] The items are scored on a 5-point Likert scale (1: almost never, 2: rarely, 3: sometimes, 4: often, 5: almost always). The total score on this scale ranges between 26 and 120, with higher scores indicating higher levels of self-compassion. Neff confirmed the construct validity of this scale by using exploratory and confirmatory factor analysis and also reported its Cronbach's alpha coefficient and test-retest reliability coefficient (at an interval of two weeks) to be 0.90 and 0.91, respectively.[25] Azizi et al. reported that the content validity ratio (CVR) and content validity index (CVI) were 0.92 and 0.90, respectively, for the Persian version of the scale.[26] In the present study, Cronbach's alpha coefficient was 0.88 for the scale.

Results

In this study, we collected information from participants in three different stages: pre-test, post-test, and follow-up from the ACT, CBT, and control groups. First, the researcher examined and described the research variables. In terms of average age, the participants were divided into three groups: 20-30 years old, 31-40 years old, and 41 years old and older; the proportion of participants in these groups was 35.1%, 33.3%, and 30.4%, respectively. In terms of educational attainment, the participants were divided into four groups: associate degrees, bachelor's degrees, master's degrees, and doctorate degrees. Likewise, the participants were divided into two groups, working and homemakers, in terms of employment status. The results of the Kruskal-Wallis test also showed that the difference between the participants in terms of age, education level, and employment status was not significant (P > 0.05) (Table 3).

Table 3. Demographic characteristics in the experimental and control groups

Variables	Demographic information	ACT	CBT	Control	Kruskal-Wallis H	P
		[n (%)]				
Age (year)	20 to 30	13 (35.1)	12 (32.4)	12 (32.4)	0.100	0.752
	31 to 40	10 (33.3)	10 (33.3)	10 (33.3)		
	41 ≥	7 (30.4)	8 (34.8)	8 (34.8)		
	Total	30 (33.3)	30 (33.3)	30 (33.3)		
Grade	Associate degree	6 (42.9)	3 (21.4)	5 (35.7)	0.210	0.646
	Bachelor's degree	8 (30.8)	11 (42.3)	7 (26.9)		
	Master's degree	14 (31.1)	13 (28.9)	18 (40.0)		
	Doctoral degree	2 (40.0)	3 (60.0)	0 (0)		
	Total	30 (33.3)	30 (33.3)	30 (33.3)		
Employment status	Employed	13 (36.1)	12 (33.3)	11 (30.6)	0.278	0.870
	Housewife	17 (43.3)	18 (40.0)	19 (36.7)		

ACT: Acceptance and commitment therapy; CBT: Cognitive-behavioral therapy

The researcher also examined the mean and SD of the variables in the experimental and control groups in the research stages.

Table 4 shows the mean and SD of the ACT and CBT scores and the control level in the pre-test of suppressed anger. Moreover, the mean and SD of the ACT, CBT, and the control group scores in the pre-test of self-compassion groups were not significantly different among the participants. On the other hand, after the post-test and follow-up period, the mean and SD of participants' suppressed anger scores in the ACT and CBT changed lower than the mean and SD of the participants in the control group. Additionally, the scores of the self-compassion variables in the ACT and CBT groups were more significant than the mean and SD of the participants in the control group. In the following, the researcher investigated the difference between the three stages of pre-test, post-test, and follow-up measurements using the MANCOVA method and the Bonferroni test.

Based on table 5, there was a significant difference between the scores of the research variables in the three phases of pre-test, post-test, and follow-up ($P < 0.001$).

Based on table 6, there was a significant difference between the scores of the research variables between the ACT and CBT groups and the control in most cases. However, there was a difference in the suppressed anger variable between the ACT and CBT groups ($P < 0.001$). Likewise, there was no significant difference in self-compassion between ACT and CBT groups. However, there were significant differences between the ACT and CBT groups and the control group in both variables.

Discussion

The present study aimed to compare the effect of ACT and CBT intervention methods on suppressed anger and self-compassion of women with chronic pain disorders.

Table 4. Description of research variables

Variable	Groups	Pre-test	Post-test	Follow-up
		Mean ± SD		
Suppressed anger	ACT	167.60 ± 16.40	98.00 ± 3.76	57.80 ± 4.78
	CBT	168.70 ± 15.67	89.53 ± 11.02	67.30 ± 12.61
	Control	174.03 ± 17.56	158.36 ± 18.84	150.06 ± 19.30
Self-compassion	ACT	39.20 ± 7.34	89.10 ± 6.40	124.40 ± 7.92
	CBT	40.40 ± 7.11	91.30 ± 7.30	119.70 ± 7.94
	Control	41.03 ± 7.69	43.80 ± 7.06	36.13 ± 7.75

ACT: Acceptance and commitment therapy; CBT: Cognitive-behavioral therapy; SD: Standard deviation

Table 5. Bonferroni's post hoc test to explore differences between three stages means while controlling the experiment-wise error rate

Variables	Time (I)	Time (J)	Mean difference	SE	P
Suppressed anger	Pre-test	Post-test	54.856*	2.256	0.001
		Follow-up	78.433*	1.984	0.001
	Post-test	Follow-up	23.578*	1.728	0.001
Self-compassion	Pre-test	Post-test	-34.511*	0.976	0.001
		Follow-up	-53.200*	1.163	0.001
	Post-test	Follow-up	-18.689*	0.958	0.001

SE: Standard error
*P < 0.001

The results showed that ACT and CBT had an positive effect on decreased suppressed anger and enhanced self-compassion in women with chronic pain. These results mean that in both ACT and CBT, it is possible to reduce suppressed anger in chronic pain and may also increase self-compassion. This finding implicitly aligns with the results of Lai et al.,[3] Dixon et al.,[17] and Roushani and Honarmand.[21] A study revealed that a style of inhibiting the expression of angry feelings was the strongest predictor of reports of pain intensity and pain behavior among a group of variables, including demographics, pain history, depression, anger intensity, and other styles of anger expression. Similarly, anger intensity contributed significantly to predictions of perceived pain interference and activity level.[6] Moreover, trait × situation interactions for trait anger suppression (anger-in) indicated similar influences of pain intensity on subsequent behavioral anger expression occurring among low anger-in persons.[7] To explain these findings, total pain relief is often considered an unattainable therapeutic goal for most people with chronic pain. ACT, therefore, aims to assist individuals in accepting their pain, as well as their thoughts and feelings about pain, to support them in preventing or trying to minimize pain constantly, and to enable them to develop patterns of constructive actions to pursue their life goals and lead a life guided by their values.[3]

Moreover, the research literature has supported the study findings on the effectiveness of ACT for enhanced self-compassion.[28-30] For example, previous studies indicated that the ACT improved self-compassion in women experiencing emotional divorce.[29,30] By ACT, researchers aim not to make the feeling of helplessness or belief in helplessness, but rather to give up one's previous strategies used to control these thoughts and feelings. These situations pave the way for introducing acceptance as an alternative solution. Through acceptance, the individual is allowed to pay attention to the critical and valuable matters in life.[28,30] Based on previous research, it has been shown that ACT can increase people's acceptance rate, and thus is effective on self-compassion. Acceptance in ACT is opposed to avoidance and involves fully recognizing and being aware of feelings without trying to change them.[28]

Table 6. Bonferroni's post hoc test to examine differences between three groups

Variables	Time (I)	Time (J)	Mean difference	SE	P
Suppressed anger	ACT	CBT	-0.711	2.418	> 0.999
		Control	-53.000*	2.418	< 0.001
	CBT	ACT	0.711	2.418	> 0.999
Self-compassion	ACT	CBT	0.433	1.234	> 0.999
		Control	43.922*	1.234	< 0.001
	CBT	ACT	-0.433	1.234	> 0.999

ACT: Acceptance and commitment therapy; CBT: Cognitive-behavioral therapy; SE: Standard error
*P < 0.001

Likewise, in line with previous research, CBT is effective as the most common treatment approach in controlling anger and reducing anger and suppressing it in general.[18,19] CBT reduced the feeling of anger after the intervention and follow-up sessions.[20,21] Individuals with social anxiety disorder (SAD) who are higher in anger suppression and/or expression might be better suited to CBT than mindfulness-based stress reduction (MBSR).[19] According to previous studies, in CBT, patients first learn to identify painful thoughts and repressed anger about their problem and also determine if those thoughts are realistic or not. If these thoughts are deemed unrealistic, the patient will learn skills that will help them change their thinking to fit their current situation better.[20] In CBT, a person's perception of a situation determines their reaction to it more than the reality of that problem. When a person has suppressed anger, their perspective may not be realistic.[19] According to previous studies, when the patient's perspective becomes more realistic, the therapist can help him determine appropriate measures to reduce suppressed anger.[19,21]

Furthermore, CBT, as well as ACT, enhanced self-compassion among women with chronic pain. This finding was consistent with that of previous studies.[13,28-30] Previous findings supported mindfulness-based cognitive therapy's effectiveness on self-compassion and cognitive reactivity. In sum, MBCT is a more effective intervention than CBT in cognitive reactivity and self-compassion.[30] Individuals may acknowledge negative emotions through self-compassion, but they do not override their difficulties or let them dictate their core values. Therefore, they can positively reevaluate their current traumatic situations through cognitive restructuring, learning, and growth.[15,16] Neff summarizes that self-compassionate people strive for personal growth and improvement. However, they focus more on their intrinsic interest in development instead of expectations from the outside.[13]

The present study has some limitations. It was conducted on a sample of women suffering from chronic pain disorder in Tehran City who had records in the hospitals selected for this study, and caution should be exercised in generalizing to other groups and clinical samples. Therefore, it is suggested that a sample with a larger volume as well as more diverse patient groups, such as men with chronic pain disorder, be used in future research. Self-report and quantitative scales were used to collect data; because there is a possibility of bias in such instruments, participants may have a subjective bias in responding. The large number of questions in the questionnaire and the tendency of some subjects to exaggerate the answers to some items in the questionnaire to create a favorable image of themselves are other limitations of this research.

Therefore, it is suggested that other methods of obtaining information, such as observation and interviews (structured and semi-structured) be used in future research.

Conclusion

Based on the present research, it is necessary to pay attention to women suffering from chronic pain disorder, and therefore it is suggested that ACT and CBT approaches be used in special consultations for women in hospitals and also services to these groups be provided.

Conflict of Interests

Authors have no conflict of interests.

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