Investigation of the Effect of Acceptance and Commitment Therapy on Chronic Pain in the Elderly

Zahra Nazari[1], Mohammad Esmaeil Ebrahimi[1], Seyed Ali Mousavi Naseh[1], Ali Sahebi[2]

[1]Department of Humanities, Hamedan Branch, Islamic Azad University, Iran, [2]Department of Clinical Psychology, William Glasser Institute-International, Sydney, Australia

Abstract

Introduction and Purpose: The aim of this study was the evaluation of the therapeutic effect of acceptance and commitment of chronic pain in the elderly women of Hamadan. **Materials and Methods:** The research method was a quasi-experimental research and the research design was pretest-posttest with control group. The population consisted all of women 60–90 years old with chronic pain in Hamedan. The sample of this research consisted of 30 people from the mentioned community. The sample was selected from volunteers who received the highest score in chronic pain questionnaire, and they were randomly divided into control and two experimental groups. The assessment tool is chronic pain questionnaire that includes two numeric measurement scale of pain intensity and physical disability questionnaire. The research data were analyzed through using different methods of descriptive statistics (central tendency and dispersion) and inferential statistics (non-parametric tests such as Kolmogorov–Smirnov, Mann–Whitney, Wilcoxon, and t-test). **Findings:** The results showed that the treatment based on acceptance and commitment resulted in positive effects on chronic pain, decreasing pain intensity, and reducing physical disability in the elderly (P < 0.05)

Key words: Acceptance and commitment therapy, chronic pain, old age, pain intensity, physical disability

INTRODUCTION

The word pain is derived from the Greek word "Poine" meaning punishment.[1] The international association for the study of pain defines the pain as "an unpleasant psychological experience associated with probable or real damage of the tissue or created during such tissue damages.[2] The pain is classified into two types of acute and chronic pains. Acute pain is generally characterized as a quick and short-term onset of pain. Chronic pain with uncontrollable and long-term pains loses its alarming and adaptive role, leading to negative impact on quality of life and disability and different problems for humans. The severity of pain and physical damage has been considered as important predictors of disability in many studies.[3,4] However, disability is not just a function of the degree of physical damage or severity of pain reported by the patient. In fact, different studies have reported the correlation between pain severity and mental disability in the range from weak to moderate.[5-7] This type

of pain might affect different age groups such as elderly people. Its prevalence is high in the elderly people so that one-third of the elderly people suffers from chronic pain, caused by many reasons including arthritis, osteoporosis, and vascular disorders.[8] In the cases in which chronic pain is not controlled, it can result in reduced performance and developed disability in the elderly people. In addition, it will result in social isolation, reduced sleep quality, and reduced appetite. Elderly people with chronic pain often suffer from loneliness, frustration, helplessness, depression, and fear.[9] In addition to chronic pain, elderly people suffer from motor and functional disabilities, leading to inactivity and more dependence in them.[10] A group of researchers argues that depressed mood decreases the threshold of pain tolerance.[11] For many centuries, physicians and other health professionals

have used different methods to reduce pain.[12] Nowadays, psychological methods are used both separately and in combination with other medical methods in the treatment of chronic pain. The studies conducted in this regard suggest the high effectiveness of psychological treatment methods. Among different types of psychological treatments such as biofeedback, mental imaging, cognitive therapy, and so on, acceptance and commitment-based therapy (ACT) approach seems to be promising in the treatment of chronic pain by reducing physical performance and mental health. In spite of moderate effectiveness of some biological and psychological treatments, chronic pain is still a stressful and debilitating disease for many people, and there is no certain and successful treatment for it.[13] Thus, acceptance finds great importance in examining and treatment of chronic pain. People who insist on pain controlling and full elimination of it avoid the situations or activities through which they have not been able to control the pain, if they fail (which its possibility is high due to chronic pain). It is concluded that this avoidance leads to reduced physical fitness and gradually development of physical disability.[14] Acceptance in ACT is defined as: "Recognizing an event or situation and leaving the program of controlling ineffective signs or the active process of feeling of senses as emotions, thinking of thoughts as thoughts, etc."[15] We should not confuse acceptance with tolerance or surrender. Both of them are passive. Acceptance is a type of increase in belief, a type of active hugging of the present moment, completely, and without defense. Commitment is adhering to a given value or behavior in line with values. Commitment might be a desire to experience unpleasant thoughts and feelings experienced in the path of life. The commitment is selected moment by moment. At any moment, it can be freely decided whether to perform a behavior in line with a given value.[16] In recent years, the effectiveness of ACT on depression, anxiety related to pain, feeling disability, job performance, and the number of referrals to the physician[17] with moderating variables of pain such as beliefs related to injury caused by pain, fear of movement, considering pain as catastrophe, and self-efficacy has been reported.[18] The current research is the first research examining the impact of ACT on chronic pain in the elderly people. This research aims to examine the impact of ACT on chronic pain in Hamadan elderly people. Findings of this research can be used by patients with chronic pain and their families, physicians, psychologists, counselors, and researchers.

RESEARCH METHODOLOGY

The current research is an applied study considered among the semi-experimental designs with pretest-posttest design with control group. It was conducted to examine the impact of acceptance commitment-based therapy on chronic pain in the elderly people. Population, sample, and sampling method: The statistical population of the study included all 60–90-year-old females with chronic pain admitted to Hamadan physical and therapeutic centers in the summer and autumn of 2016. The sample of the study included 30 people who were selected among the population using targeted sampling method. The inclusion criteria of the study included as follows: (1) Chronic pain (a pain lasting at least 6 months from its onset and continued despite treatment during the past 3 months every day), (2) age more than 60 years, and (3) not having severe psychological disorders. Subjects were selected from among the candidates who received the highest score in chronic pain test, and they were randomly divided into experimental and control groups. The experimental group participated in an eight sessions of 45 min intervention. However, the control group received no intervention. After implementation of eight sessions of ACT, two groups were post-tested.

Research tool

Pain severity measurement scale: In this research, patients were asked to rate their pain severity from 0 to 10. Zero indicates the lack of pain and the score 10 indicates the maximum pain severity. The validity and reliability of this scale have been reported by many studies Asghari Moghadam (1999).

Pain-related physical disability: Roland and Maurice disability questionnaire was developed in 1983. It includes 24 questions, which its content includes a range of physical disabilities caused by pain. Validity and reliability of this questionnaire have been approved among patients with chronic pain Roland and Maurice (1983) and Dave, 1986; quoted by Asghari Moghadam (1999). In this questionnaire, patient's scores vary from 0 to 24, in which higher score suggests more severe physical disability.

Data analysis method: Data were analyzed using SPSS 23 software. The Kolmogorov–Smirnov test was used to examine the normal distribution of the population (normality of the data). Mann–Whitney test was also used to compare the pre-test in two groups, and Wilcoxon test and *t*-paired test were used to evaluate the impact of intervention on chronic pain.

Research findings

In this section, we report the information obtained based on the pre-test and post-test scores of disability, pain severity, and chronic pain in the groups.

The mean and SD of disability in the control and experimental groups were 16.40 ± 1.76 and 16.86 ± 1.71 in pre-test, respectively, while they were 17.00 ± 2.77 and 13.60 ± 2.29 in post-test, respectively. The mean and SD of pain intensity in the control and experimental groups were 21.66 ± 1.94 and 20.80 ± 2.27 in pre-test, respectively, while they were 21.73 ± 3.12 and 18.06 ± 2.65 in post-test, respectively. The mean and SD of chronic pain in the control and experimental groups were 37.66 ± 3.65 and 37.66 ± 33.3 in pre-test, respectively,

Table 1: Mean and standard deviation of variables of disability, pain severity, and chronic pain in pre-test and post-test

Group	Control group				Experimental group			
	Pre-test		Post-test		Pre-test		Post-test	
	n	Mean±SD	n	Mean±SD	n	Mean±SD	n	Mean±SD
Disability	15	16.40±1.76	15	17.00±2.77	15	16.86±1.71	15	13.60±2.29
Pain severity	15	21.66±1.94	15	21.73±3.12	15	20.80±2.27	15	18.06±2.65
Chronic pain	15	37.66±3.65	15	38.73±5.72	15	37.66±3.33	15	31.66±3.99

SD: Standard deviation

Table 2: Findings of normality of chronic pain in pre-test and post-test

Group	Control group						Experimental group					
	Pre-test			Post-test			Pre-test			Post-test		
	n	Z	P	n	Z	P	n	Z	P	n	Z	P
Chronic pain	15	0.276	0.003	15	0.219	0.050	15	0.158	0.200*	15	0.145	0.200*

*Normal distribution

while they were 38.73 ± 5.72 and 31.66 ± 3.99 in post-test, respectively [Table 1].

Data Analysis

The first hypothesis: Acceptance commitment-based therapy affects the chronic pain in elderly people.

For this purpose, pre-test scores were compared first in two groups. For this purpose, the assumption of the normality of the chronic pain variable in the pre-test stage in the two groups was examined using the Kolmogorov–Smirnov test [Table 2].

Findings of Kolmogorov–Smirnov test in Table 2 revealed that chronic pain in the pre-test and post-test in the experimental group did not have normal distribution ($P < 0.05$). Thus, the Mann–Whitney test was used to compare the pre-test scores in both experimental and control groups.

Mann–Whitney test revealed no significant difference in pre-test pain scores of two groups [Table 3].

Thus, to examine the impact of the test, we compare post-test scores in two groups. For this purpose, given the non-normality of post-test chronic pain, Mann–Whitney test is used.

Findings of Mann–Whitney test in Table 4 revealed a significant difference between the two groups in post-test so that intervention was effective. As shown in Table 1, the mean of chronic pain was reduced after the intervention in the experimental group. In addition, Wilcoxon test was used to examine the impact of intervention on chronic pain in the experimental given the non-normality of chronic pain.

Table 5 illustrates that Wilcoxon test was effective in intervention group, and there was a significant difference

Table 3: Findings of Mann–Whitney test of chronic pain of pre-test pain in two groups

Variable	Test statistic	P
Chronic pain	0.850	0.87

Table 4: Findings of Mann–Whitney test of chronic pain in post-test in two groups

Variable	Test statistic	P
Chronic pain	−3.433	0.001

Table 5: Findings of Wilcoxon test in the experimental group

Variable	Test statistic	P
Chronic pain	−1.066	0.001

Table 6: Findings of *t*-paired test in control group

Variable	Test statistic	P
Chronic pain	−3.41	0.320

between pre-test and post-test ($P < 0.05$). Considering the normality of chronic pain variable in the control group, the t-paired test was used to compare this variable in pre-test and post-test.

Findings of t-test in Table 6 showed no significant difference between pre-test and post-test in the control group.

The second hypothesis: ACT affects the disability of the elderly people.

For this purpose, the pre-test scores were compared in two groups. For this purpose, the assumption of the normality

Table 7: Normality test findings of disability variable in pre-test and post-test												
Group	Experimental group						Control group					
	Pre-test			Post-test			Pre-test			Post-test		
	n	Z	P	n	Z	P	n	Z	P	n	Z	P
Disability	15	0.203	0.096*	15	0.219	0.001	15	0.256	0.009	15	0.300	0.001

*Normal distribution

of disability variable in the pre-test in the two groups was examined using the Kolmogorov–Smirnov test [Table 7].

The findings of Kolmogorov–Smirnov test in Table 7 revealed that disability has normal distribution only in pre-test in the experimental group, and in other cases, this variable has no normal distribution ($P < 0.05$). Thus, to compare the pre-test scores in two experimental and control groups, Mann–Whitney test was used.

Findings of Mann–Whitney test revealed no significant difference between the two groups in pre-test disability [Table 8]. Thus, to investigate the impact of test on disability, the post-test scores were compared in two groups. For this purpose, the Mann–Whitney test is used in the experimental group given the non-normality of post-test disability.

Findings of Mann–Whitney test revealed a significant difference between the two groups in post-test disability [Table 9] so that intervention affected disability, and as shown in Table 1, the mean disability after intervention was reduced in the experimental group. In addition, to examine the impact of the intervention on disability in the experimental group, Wilcoxon test was used because of non-normality of this variable.

Findings of Wilcoxon test in Table 10 revealed that the intervention group was effective in the experimental group, and significant difference was found between the pre-test and post-test ($P < 0.05$). Considering the non-normality of the disability variable in the control group, the Wilcoxon test was used to compare this variable in the case group in pre-test and post-test.

Findings of Wilcoxon test in Table 11 revealed no significant difference between pre-test and post-test in control group ($P < 0.05$).

The third hypothesis: ACT affects the severity of pain in the elderly people.

For this purpose, the pre-test scores are first compared in the two groups. For this purpose, the assumption of the normality of the pre-test pain intensity variable in the two groups was examined using Kolmogorov–Smirnov test [Table 12].

The findings of Kolmogorov–Smirnov test in Table 12 revealed that pain severity has normal distribution in the

Table 8: Findings of Mann–Whitney test in pre-test disability in two groups		
Variable	Test statistic	P
Disability	−0.841	0.43

Table 9: Mann–Whitney test findings of post-test disability in two groups		
Variable	Test statistic	P
Disability	−3.020	0.002

Table 10: Wilcoxon test findings in experimental group		
Variable	Test statistic	P
Disability	−3.435	0.001

Table 11: Wilcoxon test findings in the control group		
Variable	Test statistic	P
Disability	−1.20	0.227

experimental group ($P > 0.05$). Thus, to compare the pre-test scores in two experimental and control groups, Mann–Whitney test was used [Table 13].

Findings of Mann–Whitney test revealed no significant difference between the two groups in pre-test pain severity [Table 8]. Thus, to investigate the impact of test on pain severity, the post-test scores were compared in two groups. For this purpose, the Mann–Whitney test is used in the control group given the non-normality of post-test disability.

Findings of Mann–Whitney test in Table 14 revealed a significant difference between the two groups in post-test pain severity [Table 9] so that intervention affected pain severity, and as shown in Table 1, the mean pain severity after intervention was reduced in the experimental group. In addition, to examine the impact of the intervention on pain severity in the experimental group, Wilcoxon test was used because of non-normality of this variable.

Findings of Wilcoxon test in Table 15 revealed that intervention was effective in experimental group, and significant difference was found between pre-test and post-test ($P < 0.05$). Given non-normality of the pain severity variable in the control group, Wilcoxon test was used to

Group	Experimental group						Control group					
	Pre-test			Post-test			Pre-test			Post-test		
	n	*Z*	*P*	*n*	*Z*	*P*	*n*	*Z*	*P*	*n*	*Z*	*P*
Pain severity	15	0.198	0.116*	15	0.166	0.200*	15	0.343	0.001	15	0.244	0.017

Table 12: Findings of normality test in pre-test and post-test pain severity

*Normal distribution

Table 13: Findings of Mann–Whitney test in pre-test pain severity in two groups

Variable	Test statistic	*P*
Pain severity	−0.855	0.41

Table 14: Mann–Whitney test findings of post-test pain severity in two groups

Variable	Test statistic	*P*
Pain severity	−2.823	0.004

Table 15: Wilcoxon test findings in experimental group

Variable	Test statistic	*P*
Pain severity	2.733	0.001

Table 16: Findings of Wilcoxon test in control group

Variable	Test statistic	*P*
Pain severity	−0.714	0.475

compare this variable in pre-test and post-test in experimental group

Findings of Wilcoxon test in Table 16 revealed no significant difference between pre-test and post-test in control group ($P < 0.05$).

CONCLUSION

The current research revealed that ACT can be useful in the treatment of chronic pain in the elderly people. Results of the study conducted by Mohammadi *et al.*[19] revealed that the severity of perceived pain and the limitations of performance is correlated with increased age, and mindfulness cognitive therapy might be useful by reducing the catastrophic pain and thereby reducing the anxiety and fear associated with pain. Results of the study conducted Julieann and Steven[20] showed that acceptance of pain is part of general psychological acceptance and stronger psychological acceptance background enables people to experience more acceptance value in facing with pain and show less avoidance reactions. These results are consistent with results of our research. Acceptance and commitment-based therapists have accepted the acceptance as one of their key processes, and they emphasize on accepting what that cannot be changed directly (thoughts, emotions, and physical feelings) rather than changing the cognitive content. The patient decreases the unsuccessful attempts to avoid or control the pain and focuses on valuable activities and following his personal goals. More acceptance of pain can predict the success of treatment, and it significantly decreases the depression and anxiety, physical disability, and pain severity. It also reduces the number of referrals to medical centers. Information obtained from the current research can be useful for acceptance and commitment-based therapists to reduce chronic pain in patients.

REFERENCES

1. Pour SH. Pain. Tehran, Timurzadeh: Physician; 2004.
2. Bowsher D. Pain: Management and Nursing Care. Edinburgh: Churchill Livingstone; 1995.
3. Weiner DK, Rudy TE, Kim YS, Golla S. Do medical factors predict disability in older adults with persistent low back pain? Pain 2004;112:214-20.
4. Gauntlett-Gilbert J, Eccleston C. Disability in adolescents with chronic pain: Patterns and predictors across different domains of functioning. Pain 2007;131:132-41.
5. Crombez G, Vlaeyen JW, Heuts PH, Lysens R. Pain-related fear is more disabling than pain itself: Evidence on the role of pain-related fear in chronic back pain disability. Pain 1999;80:329-39.
6. Geisser ME, Robinson ME, Miller QL, Bade SM. Psychosocial factors and functional capacity evaluation among persons with chronic pain. J Occup Rehabil 2003;13:259-76.
7. Asghari A, Nicholas MK. An investigation of pain self-efficacy beliefs in iranian chronic pain patients: A preliminary validation of a translated english-language scale. Pain Med 2009;10:619-32.
8. Hayes SC, Levin ME, Plumb-Vilardaga J, Villatte JL, Pistorello J. Acceptance and commitment therapy and contextual behavioral science: Examining the progress of a distinctive model of behavioral and cognitive therapy. Behav Ther 2013;44:180-98.
9. Gran SV, Festvag LS, Landmark BT. Alone with my pain-it can't be explained, it has to be experienced'. A Norwegian in-depth interview study of pain in nursing home residents. Int J Older People Nurs 2010;5:25-33.

10. Tse MM, Vong SK, Ho SS. The effectiveness of an integrated pain management program for older persons and staff in nursing homes. Arch Gerontol Geriatr 2012;54:e203-12.

11. Weisenberg M, Kreindler ML, Schachat R, Werboff J. Pain: Anxiety and attitudes in black, white and Puerto Rican patients. Psychosom Med 1975;37:123-35.

12. Curtis AJ. Psychology of Health, Translated. In: Ashtiani AF, Ashtiani HF, editors. Tehran: Besat Publications; 2010.0

13. Turk DC, Monarch ES. Biopsychosocial perspective on chronic pain. In: Turk DC, Gatchel RJ, editors. Psychological Approaches to Pain Management. 2nd ed. New York: Guid Ford Press; 2002). p. 3-32.

14. Nicholas MK, Asghari A. Investigating acceptance in adjustment to chronic pain: Is acceptance broader than we thought? Pain 2006;124:269-79.

15. Hayes SC, Strosahl KD, Wilson KG. Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change. New York: Guilford Press; 1999.

16. Parvaran NH. Examining the effectiveness of acceptance and commitment-based approach on forgiveness and marital adjustment of women affected by wife betrayal. Woman Soc 2014;5:135-50.

17. Vowles KE, McCracken LM. Acceptance and values-based action in chronic pain: A study of treatment effectiveness and process. J Consult Clin Psychol 2008;76:397-407.

18. Wicksell RK, Olsson GL, Hayes SC. Mediators of change in acceptance and commitment therapy for pediatric chronic pain. Pain 2011;152:2792-801.

19. Mohammadi F, Khani PM, Dolatshahi B, Moghaddam MA. The Effectiveness of Mindfulness Cognitive Therapy on Severity of Pain Severity and Performance Limitation of Women with Chronic Pain In Aging Process (Iran's Elderly Journal). Vol. 6, Is. 19. Iran: Spring; 2011, 2012.

20. Julieann P, Steven CH. Acceptance and commitment therapy for psychosis. Int J Psychol Psychol Ther 2003;3:311-28.