



The Effectiveness of Compassion-focused Therapy on Pain Catastrophizing, and Resilience in Skeletal-Muscular Patients

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ABSTRACT

Aims: This study was conducted to investigate the effectiveness of compassion-focused therapy on pain catastrophizing and resilience in Muscular - Skeletal (MS) patients.

Method and Materials: The method of the study was semi-experimental in nature with a pre-test-post-test design with control group. The studied population was all people with musculoskeletal pain in the first six months of 2022 in Tehran, Iran. According to this, 40 patients with skeletal-muscular pain were selected voluntarily and randomly placed in intervention and control groups (each group n=20). The Questionnaires included Sullivan et al.'s Pain Catastrophizing Pain (1995) and Connor and Davidson's resilience (2003). The experimental group received eight 90-minute sessions of compassion-focused therapy, but the control group placed at waiting list. The data were analyzed using multivariate analysis of covariance by SPSS-26.

Findings: The results indicated that the group of compassion-focused therapy significantly decreased components of pain catastrophizing (rumination, magnification, and helplessness) and increased resilience in women with MS ($P < 0.001$).

Conclusion: The findings of this research emphasized the effectiveness of compassion-focused therapy on pain catastrophizing components and resilience in skeletal-muscular patients. Since who experienced many problems with skeletal-muscular pain, it is necessary to measure the improvement of mental and physical health.

Keywords: Pain Catastrophizing, Resilience, Compassion-focused Therapy, Skeletal-muscular Patients.

Introduction

Pain is associated with several factors as demographic ,psychological components ^[1] and patients` quality of life ^[2,3], pain anxiety ^[4], psychological flexibility or resilience, pain catastrophizing ^[5], depression and emotions ^[6]. On the other hand, since chronic disease and pain are internal, they are more likely to be expressed with clear expressions or metaphors ^[7,8]. Pain catastrophizing is effective on the severity of diseases ^[9]. Catastrophizing of pain is a cognitive process of exaggerating the perceived threat of pain feelings or mental pain ^[10]. Pain catastrophizing is referred to cognitive and emotional processes that comprise the rumination, magnification, and

helplessness components about kinds of pain ^[11]. It seems that cognitive distortions in the catastrophizing mechanism, as the active mechanism in patients with skeletal-muscular sorts of pain ^[12], and the subscales of this variable have important role in cognitive schemas in pain perception ^[13], and treatment ^[14]. The level of resilience of Muscular - Skeletal (MS) patients is influenced by the level of pain ^[15] and its catastrophizing ^[16]. In psychology; resilience is expressed as a positive coping with variety of tension, crisis, and bad situations ^[17]. Resilience is known as one of the effective components in improving the mental and physical health of patients with skeletal-muscular pain ^[18]. It also prevents the

occurrence of emotional-behavioral problems confronted with stressful and anxiety-provoking conditions in kinds of pain^[19]. When experiencing pain, the best way is to know the psychological roots, face and accept it^[20]. Among the effective treatments in the third wave of cognitive behavioral therapy is focused on compassion-based therapy^[21]. This therapy is an active way to deal with negative emotional experiences, feelings and affects^[22]. In this therapeutical trend, people learn to confront with their painful feelings, as well as they can identify their experiences and feelings with compassion for themselves^[23]. The basics of compassion-focused therapy are self-compassion, mindfulness, body relaxation, and flexibility^[24]. One of the outcomes of this type of treatment is mental well-being, understanding of others, sympathy, not judging, not blaming others, tolerance enhancing, and resilience to pain through attention distortion, rethinking, changing behavior, and compassionate feeling^[25]. According to these notions, the results of the review research of Kılıç et al.^[26] indicated, compassion-based treatments reduced pain catastrophizing in patients with MS. In another systematic review study, Lanzaro et al.^[27] found self-compassion therapy is effective on self-acceptance, pain catastrophizing, self-efficacy in people with chronic pain. Ghator et al.^[28] concluded compassion-based therapy increases the resilience of patients with multiple sclerosis. Since the patients with skeletal-muscular pain magnifies her/his pain and loses her/his resilience in this field, it is necessary for cognitive therapy based on compassion to help these patients to face the root of their pain. Hence, the main purpose of this study is to investigate the effectiveness of compassion-focused therapy on pain catastrophizing, and resilience in MS patients.

Method and Material

The method of the study was semi-experimental in nature with a pre-test-post-test design with control group. The studied population was all people with musculoskeletal pain in the first six months of 2022 in Tehran, Iran. According to this, 40 patients with skeletal-muscular pain were selected voluntarily and randomly placed in intervention and control groups (each group n=20).

The sample size was 20 people for two groups using G*Power^[29]. The entering criteria were as having skeletal-muscular pain for 5 months, aging between 25 to 50 years, not receiving other psychological treatments during the study. Exiting criteria were as having more than one session absent during treatment, creating problems in the program process, lack of appropriate interaction and cooperation. Based on a call on Instagram, 150 people volunteered to participate in this study. But only 40 people announced their final readiness. The experimental group received eight 90-minute sessions of compassion-focused therapy, but the control group placed at waiting list. The questionnaires were completed before and after intervention by experimental and control groups. All ethical considerations were considered in this study. Including; receiving personal consent, compliance with the principles of privacy and personal identity of people

The used tools in this study were as follows: **Pain Catastrophizing Scale (PCS):** The pain catastrophizing scale was created by Sullivan, et al.^[30] to evaluate different dimensions of pain catastrophizing. The questionnaire has 13 items. Factor analysis indicated that catastrophizing includes the three subscales of rumination, magnification, and helplessness. These three components evaluate negative thoughts and cognition related to pain.

Table 1) Content of compassion-focused therapy sessions

Session	Target	Topic
1	Getting to know the rules of the meetings and the current problem.	<ul style="list-style-type: none"> • Introducing and communicating and creating a good relationship and therapeutic alliance and explaining the rules of the group. • Determining the goal and formulating of clients. • Listening to patients' narratives and empathizing with each other (empathy training). • Explanation about self-compassion and its elements. • A brief description of shyness and self-disability in expressing pain. • Homework: practicing calming breathing to patients.
2	Introducing self-compassion and self-criticism.	<ul style="list-style-type: none"> • Reviewing the previous meeting and examining the way members deal with themselves (critical and compassionate style). • Defining self-criticism and its causes and consequences. • Definition of compassion. • Homework: Answer the question: How compassionate are you with yourself?
3	Introducing the characteristics and skills of self-compassion and how it affects a person's mental states.	<ul style="list-style-type: none"> • Examining homework and reviewing the previous session; What is self-compassion? • Examining its characteristics and skills and how it affects the psychological states of a person. • Introducing three emotional regulation systems and how to interact with them. • Homework: identifying self-critical thoughts and behavior.
4	Introduction to mental imagery.	<ul style="list-style-type: none"> • Examining the homework and reviewing the previous session, introducing mental imagery and its logic. • Teaching imagery practice and its implementation in the group (imagination of color, place and characteristics of compassion in people). • Homework: Exercise mental imagery.
5	Cultivating self-compassion and introducing concepts: wisdom, ability, warmth and responsibility.	<ul style="list-style-type: none"> • Examining homework and reviewing the previous session; Cultivating self-compassion and introducing concepts: wisdom, ability, warmth and responsibility in creating compassion. • Teaching how to portray self-compassion. • Homework: self-compassionate mental imagery.
6	Self-compassion letter writing training.	<ul style="list-style-type: none"> • Checking homework and reviewing the previous session. • Self-compassion letter writing training. • Homework: "Imagine your compassionate self is writing you a letter, visualize the conversation and write it down".
7	Explaining the fear of self-compassion and identifying thoughts that hinder the cultivation of self-compassion.	<ul style="list-style-type: none"> • Checking homework and reviewing the previous session. • Fear of self-compassion. • Identify thoughts that hinder the development of self-compassion and the user on them. • Homework: Focus on barriers to cultivating self-compassion and practice compassion for them.
8	Review and practice the skills presented in previous sessions and summarizing the concepts examined in the sessions.	<ul style="list-style-type: none"> • Checking homework and reviewing the previous session. • Summarizing the concepts reviewed and applied in previous meetings. • Asking members to explain their achievements from the group. • Homework: continue with imaging and visualizing the exercises.

Participants are asked based on Likert scale (0=never, 4=always) to describe the frequency of 13 different feelings and thoughts related to the pain experience. Lower scores indicate low catastrophizing and are associated with pain and disability in patients with chronic musculoskeletal pain. In our country, the alpha coefficient for the subscales of mental rumination, magnification, and helplessness were 0.87, 0.60, and 0.79, respectively, and the total score of the Pain Catastrophizing Scale was 0.87 [31]. In the present study, Cronbach's alpha coefficient on this whole scale was 0.87.

Resilience Questionnaire (RQ): Connor and Davidson [32] designed a resilience scale to measure the ability to deal with kinds of stress and stressors. The Connor-Davidson resilience questionnaire consists of 25 items that are scored based on a 5-point Likert scale (0 to 4). The range of it, is between 0 and 100. In the study of Connor and Davidson, the Cronbach's alpha of the questionnaire for the normal group were 0.80.4 The test-retest reliability results in the group of generalized anxiety disorder and post-traumatic stress disorder showed a suitable intraclass correlation coefficient of the resilience scale (0.87). Yaghoubi, et al. [33] in Iran, calculated the internal consistency of the entire questionnaire via Cronbach's alpha of 0.78. In the present study, Cronbach's alpha coefficient on this scale was 0.84.

Compassion-Focused Therapy package: This intervention was performed on the experimental group once a week for 90 minutes as a group. After the treatment sessions were over, components of the treatment were extracted for the experimental group and for the reasons of compliance with ethical principles; the intervention were implemented in three sessions for the control group.

Findings

The mean and standard deviation of the age of the experimental group was 37.07 ± 6.25 and for the control group was 36.83 ± 6.31 years. The descriptive data and Shapiro-Wilk test are shown in Table 2. As Shapiro-Wilk test (S-W) indicated; the distribution of scores in the two groups are normal. According to this table, Shapiro-Wilk statistics is not significant for all variables. Therefore, it can be concluded that the distribution of variables is normal (Table 2).

The results of the Levin test to examine the homogeneity of variance of dependent variables in two groups. In other words, experimental and control groups have a significant difference in the variables of rumination, magnification, helplessness, and resilience, which according to the effect size measuring, 81% of the total variance of experimental and control groups is rooted in the effect of the compassion-focused therapy. The significant results of MANCOVA, indicated, F score for rumination (40.07), magnification (53.14), helplessness (35.42), and resilience (17.65) with $P \leq 0.01$. The effect size, for rumination is 0.59, for magnification is 0.63, for helplessness is 0.67, and for resilience is 0.72. These effect sizes show the meaningful effects of compassion-focused therapy on pain catastrophizing subscales (rumination, magnification, helplessness) and resilience (Table 3).

Discussion

The purpose of this study was to investigate the effectiveness of compassion-focused therapy on pain catastrophizing and its subscales, and resilience in skeletal-muscular patients. As results indicated; the compassion-focused therapy decreased the pain catastrophizing (rumination, magnification, and helplessness) and increased the resilience in skeletal-muscular patients. These results are consistent with findings of Kılıç et al. [26], Lanzaro et al. [27]

Table 2) Descriptive indices of variables in experimental and control groups

Variables		Groups	Mean	SD	Shapiro Wilk	P*
Rumination	Pre-test	Experimental	16.04	2.28	0.180	0.071
		Control	16.20	2.24	0.116	0.041
	Post-test	Experimental	13.30	1.87	0.004	0.050
		Control	16.13	2.02	0.015	0.079
Magnification	Pre-test	Experimental	12.19	1.84	0.115	0.051
		Control	12.21	1.73	0.041	0.048
	Post-test	Experimental	10.93	1.09	0.082	0.044
		Control	12.28	1.47	0.062	0.057
Helplessness	Pre-test	Experimental	12.52	1.39	0.110	0.049
		Control	12.68	1.07	0.046	0.074
	Post-test	Experimental	9.75	1.09	0.139	0.043
		Control	12.53	1.62	0.052	0.065
Resilience	Pre-test	Experimental	61.03	4.69	0.063	0.047
		Control	61.11	3.59	0.074	0.035
	Post-test	Experimental	67.92	4.71	0.063	0.052
		Control	61.17	3.84	0.120	0.083

Table 3) Results of Univariate Analysis of Covariance on the Mean of Post-Test Scores of pain catastrophizing subscales

Variables S subscales	SS	SS Error	DF	MS	MS Error	F	P	Effect Value
Rumination	149.301	93.85	1	149.301	3.69	40.46	0.01	0.59
Magnification	79.031	36.79	1	79.031	1.83	43.18	0.01	0.63
Helplessness	64.274	42.46	1	64.274	1.66	38.71	0.01	0.67
Resilience	261.844	351.63	1	261.844	8.72	30.27	0.01	0.72

and Ghatore et al. [28]. According to Gilbert’s approach about compassion-focused therapy [34]. Because compassion-focused therapy strives to achieve a compassionate mind, which consists of the ability to be compassionate about oneself and others, as well as the ability to receive compassion from others [35]. Compassion is considered as a dimensional construct that includes two interrelated mentalities. Two basic goals of compassion-focused therapy are; to reduce self-directed hostility; and developing one’s abilities in order to create a feeling of self-confidence, kindness and self-soothing. These goals can act as an antidote to feeling threatened. Most compassion-focused therapy activities focus on developing the capacity for compassion

[36]. Therefore, based on Gilbert’s theory and in the explanation of this finding, it can be said that the patients with musculoskeletal pain learn to face their psychological characteristics seriously through the treatment based on compassion. In the group of compassion therapy, they learn that this pain is also for others and its intensity is different for them. Due to the nature of the mindfulness present in compassion therapy [37], the patients learn to deal with rumination, magnification, and helplessness in the face of pain in the here and now, thereby achieving a higher level of resilience. In accordance with the evidences of cognitive neuroscience, in third wave cognitive treatments that have a component of mindfulness increase the amount of serotonin and dopamine in people

[38]. Therefore; the mood and behavior are changed. In this regard; patients are aware; pain and other factors that are related to disease are normal human experiences and they must accept this reality and adapt themselves with these conditions and increase their resilience [39]. In conclude; they avoid self- blaming, self-judgment and their real emotions and affects (negative or positive).

There are several limitations as; due to the nature of the clinical sample, we had to use the available sample. Due to the severity of the participants' pain during the study, the treatment sessions were sometimes postponed. For this reason, it was not possible to hold follow-up procedures. Therefore, it is suggested that future studies be performed at longer intervals and the follow-up stages. Also, for future studies, psychotherapists are advised to conduct this study on patients with various pains and compare the results.

Conclusion

The findings of this research emphasized the effectiveness of compassion-focused therapy on pain catastrophizing components and resilience in skeletal-muscular patients. Since who experienced many problems with skeletal-muscular pain, it is necessary to measure the improvement of mental and physical health. Health and clinical psychologists can take help from the findings of this study to treat diseases that have psychological roots.

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analysis. HR helped in introduction writing & data gathering, GL and ZR contributed to sampling

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical Approval: Ethical principles in writing the article have been observed according to the instructions of the National Ethics Committee and the COPE regulations. All ethical principles were respected. Written consent was obtained from all participants.

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