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Effectiveness of Pain Self-Management Training on Resilience, Quality of Life, and Adherence Treatment in Women with Chronic Pain

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ABSTRACT

Objective: Chronic pain is one of the most common health problems, affecting the physical, psychological, and social aspects of patients' lives. Pharmacological approaches often have limited and temporary effects, whereas educational and psychological interventions can play a key role in improving pain-related outcomes. This study aimed to investigate the effectiveness of pain self-management training on resilience, quality of life, and treatment adherence in women with chronic pain.

Methods and Materials: This quasi-experimental study used a pretest–posttest design with a follow-up and control group. The sample consisted of 30 women with chronic pain selected through convenience sampling and randomly assigned to either the pain self-management training group (n=15) or the control group (n=15). The intervention group received eight 90-minute weekly sessions of self-management training based on Lorig's protocol. Data were collected using the Connor–Davidson Resilience Scale, the WHO Quality of Life Questionnaire, and the Modanlou Treatment Adherence Questionnaire. Data were analyzed using repeated-measures ANOVA and post-hoc tests.

Findings: Pain self-management training significantly increased resilience, quality of life, and treatment adherence in the intervention group compared to the control group ($p < 0.001$). The positive effects of the intervention persisted at the three-month follow-up, with a large effect size ($\eta^2 > 0.76$).

Conclusion: Pain self-management training is an effective and sustainable intervention for improving psychological and behavioral indicators in patients with chronic pain. It can be used as a complementary approach alongside conventional treatments. Implementing such programs in clinical and community settings is recommended.

Keywords: Chronic pain, self-management training, resilience, quality of life, adherence treatment.

Introduction

Pain is a distressing experience related to actual or potential tissue damage that includes sensory, emotional, cognitive, and social components (Kaptchuk et al., 2020). Chronic pain is one of the most fundamental psychosomatic conditions people face, and researchers have long been concerned with addressing such pain and the factors that give rise to it (Rikard, 2023). Chronic pain is pain that lasts more than three months and has a very high prevalence; among adults, it ranges from 10% to 30%, which is considerable and leaves serious consequences for patients' general health, daily functioning, and quality of life, leading to economic impacts due to healthcare utilization and lost work hours (Shi & Wu, 2023). Chronic pain is a debilitating condition in which the sufferer is confronted not only with the psychological pressure of pain but also with many other stressors that affect various aspects of life (Goudman et al., 2022).

Chronic pain is a neurological disorder arising from damage to nociceptive receptors and pain transmission pathways (Morales & Yong, 2021). In such circumstances, leveraging individuals' own capacities to reduce the negative effects of chronic pain and to manage it can be effective (Sajeevanie, 2020; Ebrahimi et al., 2021). Chronic pain is a major health problem worldwide and in Iran that significantly and negatively affects patients' quality of life, work ability, and social relationships. According to the World Health Organization, more than 20 percent of the adult population in both developed and developing countries experiences some form of chronic pain. In Iran as well, studies indicate that the prevalence of chronic pain is increasing and affects nearly 30 percent of the adult population. These alarming statistics point to an urgent need for effective solutions to manage chronic pain (Alwan et al., 2022; Rikard, 2023).

Common pharmacological treatments for chronic pain—such as analgesics and anti-inflammatory drugs—often yield temporary results and may involve unwanted side effects. Moreover, long-term use of these medications can lead to dependence and other health problems. Therefore, attention to non-pharmacological and psychological methods—such as pain self-management training—as effective alternatives without side effects is of great importance (Damush et al., 2016).

These approaches can help patients actively engage in managing their pain and acquire the skills necessary to reduce the negative impact of pain on daily life. Accordingly, the present study aimed to examine the effectiveness of pain self-management training on pain perception, resilience, quality of life, and treatment adherence in women with chronic pain.

Methods and Materials

Study Design

The present study was a quasi-experimental study with a pretest-posttest and follow-up design, including a control group. The statistical population of this study included all female patients with chronic pain in Tehran who visited pain management centers and chronic pain clinics in 2024. The sampling method in this study was convenience and voluntary sampling. To ensure the generalizability of the results and increase statistical accuracy, the sample size was determined to be 30 people based on Cochran's formula and the estimated effect size (Effect Size). Participants were randomly assigned to two groups: 15 people in the pain self-management training group and 15 people in the control group.

The inclusion criteria for the study were as follows: 1. Patients had to be formally diagnosed with chronic pain by a pain specialist. 2. Patients had to have suffered from chronic pain for at least six months. 3. Patients had to be between 18 and 65 years old. 4. Patients had to be able to attend training sessions and perform related exercises. 5. Patients had to be fluent in Persian and able to read and write. 6. Patients had to sign a written consent form to participate in the study.

The exclusion criteria included: 1. Patients who, due to medical conditions, could not attend training sessions or perform exercises. 2. Patients who experienced severe changes in their medical condition during the study and required immediate or specialized treatment. 3. Patients who could not attend training sessions regularly (attendance of at least 75% of sessions was mandatory). 4. Patients who withdrew from the study due to personal or environmental problems. 5. Patients with another physical or mental illness requiring higher diagnostic and treatment priority. 6. Patients who used any intervention other than medication or physiotherapy simultaneously with psychotherapy sessions.

Instruments

The World Health Organization Quality of Life Questionnaire: The World Health Organization Quality of Life Questionnaire (Organization, 2004) consists of 26 questions assessing four domains of quality of life, including physical health, psychological health, social relationships, and environment. Each item is scored on a 5-point Likert scale (from 1 to 5), corresponding to (not at all, a little, moderate, much, and completely) or (very dissatisfied, dissatisfied, somewhat dissatisfied, satisfied, completely satisfied). The physical health domain includes the sum of items 3, 4, 10, 15, 16, 17, and 18; the psychological quality of life domain includes the sum of items 5, 6, 7, 11, 19, and 26; the social relationships domain includes the sum of items 20, 21, and 22; and the environmental and living conditions domain includes the sum of items 8, 9, 12, 13, 14, 23, 24, and 25. It should be noted that items 3, 4, and 26 are scored inversely. According to results reported by the developers of the WHO Quality of Life scale, conducted in 15 international centers of the organization, Cronbach's alpha coefficients ranged between 0.73 and 0.89 for the four subscales and the total scale. In Iran, Nasiri-Amiri et al., (2016) reported reliability coefficients using retest (three-week interval), split-half, and Cronbach's alpha methods of 0.67, 0.87, and 0.84, respectively. Nejat et al., (2007) also reported Cronbach's alpha coefficients of 0.88 for the total scale, 0.70 for physical health, 0.77 for psychological health, 0.65 for social relationships, and 0.77 for the environmental quality of life domain.

Connor and (Connor & Davidson, 2003):

This questionnaire was developed by (Connor & Davidson, 2003). It was designed after a review of resilience research from 1979 to 1991. The questionnaire includes 25 items and aims to measure resilience in individuals. Responses are rated on a 5-

point Likert scale from 0 (not true at all) to 4 (true nearly all the time). Internal consistency, test-retest reliability, and convergent and divergent validity of the scale were found to be adequate, and exploratory factor analysis confirmed five factors: personal competence, trust in one's instincts/tolerance of negative affect, positive acceptance of change/secure relationships, control, and spirituality (Connor & Davidson, 2003). In Iran, the validity and reliability of this questionnaire were confirmed by (Besharat, 2007), cited in (Rezaeipandari et al., 2022). In Rezaeipandari et al., (2022) study, Cronbach's alpha coefficient for this questionnaire was 0.84, indicating good reliability.

Medication Adherence Questionnaire by (Naeema et al., 1997):

The Treatment Adherence Questionnaire was developed by Naeema et al., (1997) for patients with chronic illnesses. It consists of 40 items assessing seven domains: treatment diligence, willingness to participate in treatment, adaptability, integration of treatment with life, adherence, commitment, and hesitation in treatment execution. According to the questionnaire's scoring instructions, initial scores are converted to a range between 1 and 100. Scores of 75–100 indicate very good adherence, 50–74 indicate good adherence, 25–49 indicate moderate adherence, and 0–24 indicate poor adherence. The test–retest reliability of the instrument was reported as 0.875, content validity as 0.91, and Cronbach's alpha as 0.92 (Dehghan et al., 2016).

Interventions

Pain Self-Management Training:

Pain self-management training was conducted using the Chronic Pain Self-Management Program protocol developed by (Lorig, 2003) in eight weekly 90-minute sessions aimed at enhancing patients' ability to manage pain and improve quality of life.

Table 1

Pain Self-Management Training Sessions

Session	Title	Session Details
First	Introduction and orientation	Introducing participants, explaining program goals, teaching basic self-management concepts and their importance
Second	Identifying and managing pain	Teaching pain recognition techniques, introducing pain assessment tools, discussing pain management strategies
Third	Physical exercises	Teaching suitable physical exercises for pain management, practical demonstrations, physical activity recommendations
Fourth	Relaxation techniques	Teaching relaxation techniques such as breathing exercises, meditation, and yoga, with practical practice
Fifth	Stress management	Teaching stress reduction methods, introducing coping techniques, practical exercises, and group discussion
Sixth	Behavioral and lifestyle changes	Teaching positive lifestyle changes, planning for healthy habits, time and energy management
Seventh	Medication management	Teaching medication management, recognizing side effects, proper use of medications, group discussion on experiences

| **Eighth** | Summary and future planning | Reviewing taught materials, planning for continued self-management, providing feedback and Q&A |

Implementation Procedure

Patients were evaluated according to inclusion and exclusion criteria. Eligible patients were randomly assigned to three groups (pain self-management training, emotion regulation training, and control group). Each group participated in training sessions for 8 to 10 weeks. Initial assessments were conducted before the interventions, post-intervention assessments were done after completion, and follow-up assessments were conducted three months later to measure dependent variables (pain perception, resilience, quality of life, and treatment adherence).

Ethical Considerations

Ethical considerations for the present study were as follows: 1. All participants received oral information about the study and participated voluntarily after providing informed consent. 2. Participants were assured that all information would remain confidential and used only for research purposes. 3. To maintain privacy, names and surnames of participants were not recorded. 4. To ensure consistency, all questionnaires were administered by the researcher.

Analysis

Descriptive statistics (mean, standard deviation, minimum, and maximum) were used to summarize participants' demographic characteristics. The Kolmogorov–Smirnov test was used to check the normality of data distribution, and Levene's test was used to examine homogeneity of variances. Repeated measures analysis of variance (ANOVA) was employed to determine the effectiveness of pain self-management training on pain perception, resilience, quality of life, and treatment adherence. All statistical analyses were conducted using SPSS software version 25.

Findings and Results

In this study, 30 women with chronic pain participated and were randomly assigned to two groups: pain self-management training (15 participants) and control (15 participants). The participants' age range was between 25 and 64 years (overall mean age = 45.3 years, standard deviation = 8.2). Regarding educational level, 40% of the total sample held a high school diploma, 36.7% held a bachelor's degree, and 23.3% held a master's degree. In terms of marital status, 86.7% were married and 13.3% were single. The chi-square test indicated no significant differences between the two groups in demographic variables ($p > 0.05$). The mean and standard deviation of resilience, quality of life, and treatment adherence scores in the pretest, posttest, and follow-up phases are presented in Table 2.

Table 2

Mean and Standard Deviation of Variables in Three Phases

Variable	Group	Pretest (M±SD)	Posttest (M±SD)	Follow-up (M±SD)
Resilience	Pain Self-Management Training	45.60 ± 6.12	61.40 ± 5.82	59.33 ± 5.25
	Control	44.80 ± 6.55	45.20 ± 6.33	44.93 ± 6.41
Quality of Life	Pain Self-Management Training	62.80 ± 7.14	78.60 ± 6.85	76.93 ± 6.20
	Control	63.40 ± 6.90	63.93 ± 7.12	63.53 ± 6.77
Treatment Adherence	Pain Self-Management Training	58.46 ± 8.25	74.26 ± 7.98	73.00 ± 7.52
	Control	59.13 ± 8.10	59.53 ± 8.35	59.00 ± 8.20

The Kolmogorov–Smirnov test showed that the distribution of all variable scores in all three stages was normal ($p > 0.05$). Levene's test also confirmed homogeneity of variances for all variables ($p > 0.05$). Therefore, the use of repeated measures ANOVA was appropriate. The results of repeated measures ANOVA (Table 2) showed that both the main effect of time and the time × group interaction effect were significant for all three variables ($p < 0.001$), meaning that the changes in scores over time and the pattern of change between the two groups were significant.

Table 3

Results of Repeated Measures ANOVA

Variable	Source of Variation	F	p	η^2
Resilience	Time	112.45	<0.001	0.80
	Time × Group	105.32	<0.001	0.79
Quality of Life	Time	125.87	<0.001	0.82
	Time × Group	118.26	<0.001	0.81
Treatment Adherence	Time	98.14	<0.001	0.77
	Time × Group	92.60	<0.001	0.76

To further examine the differences, pairwise comparisons between pretest, posttest, and follow-up stages were conducted (Table 4).

Table 4

Results of Pairwise Comparisons Between Time Phases in the Pain Self-Management Training Group

Variable	Comparison	t	p
Resilience	Pretest – Posttest	-7.223	<0.001
	Pretest – Follow-up	-5.891	<0.001
	Posttest – Follow-up	0.613	0.550
Quality of Life	Pretest – Posttest	-5.151	<0.001
	Pretest – Follow-up	-6.489	<0.001
	Posttest – Follow-up	0.842	0.410
Treatment Adherence	Pretest – Posttest	-6.987	<0.001
	Pretest – Follow-up	-6.522	<0.001
	Posttest – Follow-up	0.492	0.627

The results showed that pain self-management training significantly increased resilience, quality of life, and treatment adherence from pretest to posttest and from pretest to follow-up. The difference between posttest and follow-up was not significant, indicating the stability of intervention effects over time. No significant changes were observed in the control group. The large effect size ($\eta^2 > 0.76$) indicates a very strong impact of the intervention.

Discussion and Conclusion

The findings of this study showed that pain self-management training significantly improved resilience, quality of life, and treatment adherence in women with chronic pain, and these changes remained stable not only at the posttest stage but also during the three-month follow-up period. These results indicate that the intervention produced not only short-term effects but also enduring impacts on participants' behaviors and attitudes. Such findings are particularly important given the multidimensional nature of chronic pain—which includes physical, psychological, and social components—since purely pharmacological approaches typically have limited lasting effects and are often accompanied by side effects.

Previous studies have also reported similar results. For example, (Zarrin et al., 2020) found that implementing a self-management program based on the Lorig model led to reduced pain intensity, improved physical functioning, and enhanced quality of life among patients with arthritis. Likewise, (Tseli et al., 2023) showed that self-management interventions emphasizing coping and emotion regulation skills significantly enhanced resilience in patients with chronic low back pain. The consistency of these findings with those of the present study suggests that self-management training, due to its active and participatory

nature, can be effective across different clinical and cultural contexts.

From a psychological perspective, the observed increase in resilience can be attributed to training in skills such as problem-solving, cognitive restructuring, and relaxation techniques. Resilience is defined as the ability to cope with stressful conditions and return to equilibrium after experiencing adverse events (Southwick & Charney, 2018). Self-management training enhances this ability by increasing patients' sense of control and self-efficacy. Farley, (2020) also confirmed that self-efficacy plays a crucial role in the resilience of patients with chronic conditions, and interventions targeting this component demonstrate greater effectiveness.

The improvement in quality of life observed in this study can be explained by reduced negative pain perception, increased physical activity, and strengthened social relationships. Quality of life is a multidimensional concept encompassing physical, psychological, social, and environmental dimensions (Organization, 1997). Self-management programs provide tools to better manage symptoms and stress, enabling patients to participate more actively in daily and social activities. Mann et al., (2013) also found that using relaxation techniques, mindfulness meditation, and activity planning is directly associated with improved quality of life in chronic pain patients.

Another key finding of this study was the increase in treatment adherence in the intervention group. Treatment adherence is one of the major challenges in managing chronic diseases, and non-adherence can lead to symptom exacerbation and higher healthcare costs (Nieuwlaat et al., 2014). Self-management training, by providing the knowledge and skills necessary to understand the importance of adherence and practical strategies for integrating treatment plans into daily life, significantly enhanced this outcome. Huang et al., (2024) also reported that self-management programs improve treatment adherence by increasing patients' awareness of their illness progression and the benefits of treatment.

The stability of effects observed in the follow-up stage suggests that participants were able to successfully apply the skills and strategies learned during the program in their daily lives. This finding underscores the importance of interventions that empower patients and promote their active role in managing their conditions.

In many traditional approaches, patients play a relatively passive role, whereas in the self-management model, individuals assume significant responsibility for managing their symptoms and lifestyle.

The results of this study have important clinical implications. Clinically, self-management training can be used as a complementary intervention alongside pharmacological and physiotherapy treatments. This approach can not only enhance patients' psychological and social indicators but also reduce dependence on medications and the risk of side effects. Furthermore, since this type of training can be conducted in groups or through online programs, it is both scalable and cost-effective.

From a health policy perspective, the findings of this study indicate that integrating self-management programs into chronic disease treatment protocols can reduce the economic and social burden of these conditions. Health organizations can facilitate the implementation of such programs by training professionals and providing the necessary infrastructure. Additionally, designing mobile applications and online platforms for delivering training and patient follow-ups can improve accessibility and sustain intervention effects.

However, this study has several limitations that should be considered when interpreting the results. First, the relatively small sample size and its restriction to women limit the generalizability of the findings. The use of self-report measures may also introduce response bias and reduce data accuracy. Furthermore, the three-month follow-up period did not allow for full assessment of long-term effects. Therefore, future studies should include larger and more diverse samples (both genders) and longer follow-up periods to enable more confident generalization of results.

It is recommended that future research compare the effectiveness of self-management training with other psychological approaches such as Acceptance and Commitment Therapy (ACT) or Cognitive-Behavioral Therapy (CBT) to determine which is more effective in specific contexts. Moreover, using objective indicators, such as measuring physical activity with wearable devices or assessing biological markers related to stress, could enhance the validity of findings.

Despite its limitations, this study clearly demonstrates that pain self-management training is an

effective, cost-efficient, and sustainable intervention for improving resilience, quality of life, and treatment adherence in women with chronic pain. By providing practical skills, fostering motivation, and increasing patients' awareness, this intervention enables individuals to play a more active role in managing their conditions and thereby gain greater control over their health and lives. Such an approach could serve as a model for managing other chronic diseases as well, highlighting the need for greater attention from policymakers and health professionals.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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