## Original Article

# The Effect of Pain Self-Management Education on Pain Severity and Quality of Life in Metastatic Cancer Patients

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## ABSTRACT

**Objective:** Proper pain control in cancer patients is one of the prime needs of metastatic cancer patients. It is, then, one of the essential objectives of health care workers. The present study aimed to pinpoint the impact of pain self-management education on the pain severity and the quality of life in patients with metastatic cancers using complementary medicine approaches. **Methods:** This clinical trial study was performed in the Oncology Specialty Clinic of Ahvaz Golestan Hospital on 82 metastatic cancer patients picked based on inclusion criteria. They were randomly assigned to two groups: the intervention group and one as the control group. In the intervention group, pain self-management was taught in the three steps of providing information, skill development, and guidance. Self-management approaches were also practically taught face to face along with feedback. Furthermore, the quality of life was measured at 1-and 3-month follow-ups and the pain severity was measured during 7 weeks. In the control group, the quality of life questionnaire and the pain severity checklist were given to the participants to fill out. Finally, data were analyzed through SPSS version 22 in general and repeated-measures ANOVA and Friedman tests. **Results:** It was observed that after the intervention, the trend of pain severity during weeks 1–7 was significantly different in the intervention and control groups ($P < 0.0001$). In addition, a significant difference was observed for the quality of life at 1 and 3 months after the intervention between the two studied groups ($P < 0.0001$). **Conclusions:** Findings of the present study indicate a positive impact of pain self-management on improving pain severity and the indicators of quality of life in metastatic cancer patients. Accordingly, the current study findings can help nurses, nursing students, and other team members improve pain control skills and subsequently increase the quality of life in patients with metastatic cancers.

**Key words:** Metastatic cancer, pain, self-management, the quality of life

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## Introduction

According to the International Association for the Study of Pain, pain is, in essence, a hidden feeling and emotional experience pertinent to acute or potential tissue damage.[1] Furthermore, chronic pain syndrome is typically taken as a common problem causing significant challenges for therapists primarily due to its complex nature, unclear etiology, and inadequate response to treatment.[2] Pain is a significant concern in people with metastatic cancers.[3] It is a distressing symptom of cancer affecting the quality of life, family, and caregivers.[4,5] More than 50% of cancer patients express five common symptoms of the disease, including fatigue, pain, low energy, weakness, and poor appetite.[6] Depending on the type and the degree of the disease, 30%–75% of cancer patients experience pain, and despite the high effectiveness of drugs, pain control is a persistent problem in cancer patients.[7]

Despite using painkillers to mitigate pain in cancer patients, many still experience moderate to severe pain; and some do not have access to appropriate medication.[5,8] In 1986, the World Health Organization (WHO) offered a guideline for pain relief in cancer patients. According to it, a nonsteroidal anti-inflammatory drug or acetaminophen should be used for mild pain. Furthermore, weak narcotics such as codeine should be used for moderate pain, and potent narcotics such as morphine or fentanyl should be used for severe pain.[9] However, such narcotics are mostly limited or unavailable in many middle-income areas.[10]

Pain assessment and pain management response can be influenced by the patient, professional health care, and interactions.[11] Assessing, managing, and mitigating cancer-associated pain and discomfort is a significant concern for cancer palliative care nurses.[12]

Treatment-related pain can lead to reduced quality of life, long-term disability, and increased psychological stress.[5,13] The WHO defines the quality of life as the result of different aspects of life such as the health determinants, happiness (including the comfort of the physical environment and job satisfaction), training in intelligence and social achievements, the freedom of action, justice and the lack of oppression.[14] Health-related quality of life is currently considered an essential endpoint in cancer clinical studies.[15]

Given the above challenges and the fact that cancer treatment is changing and the outpatient treatment of this disease is becoming more common, patients take responsibility for pain management at home, and pain self-management as a contributor to successful pain treatment is gaining ever-increasing importance.[16] These interventions have important clinical implications regarding the patient's barriers to cancer pain control and help increase self-efficacy and reduce pain severity.[17] Self-management includes symptom management, adherence to therapeutic diets, and coping with the disease in functional, emotional, and interpersonal aspects.[18] The patient needs to know pain, be aware of it, and have knowledge of its complications to be able to manage it.[16]

Education is one of the ways to promote pain self-management in patients.[19] However, many physicians do not have the time and the expertise to educate and counsel patients effectively.[20] Hence, the need for self-management training for patients by nurses is clearly understood. The results of Koller *et al.*'s study on cancer patients showed that pain self-management intervention had considerably positive effects on reducing pain intensity, improving the quality of life, increasing self-efficacy, and reducing functional interference.[16] Another study by John *et al.* on cancer patients highlighted the positive effect of pain self-management education in cancer patients.[21]

Proper pain control in cancer patients is among patients' significant needs and one of the most critical health workers' objectives. Recent studies have shown an increasing tendency of cancer patients toward different branches of complementary medicine.[22] However, it should be noted that the use of complementary medicine, mainly due to the high costs and the limited number of therapists in each region, does not apply to all patients, and only a limited number of patients can use it depending on their geographical and economical situation.

Given the limited number of studies in this field and because most of these studies have focused only on pharmaceutical approaches to pain relief and ignored the use of complementary medicine methods, the present study aimed to cast light on the effect of pain self-management education, using both pharmaceutical and complementary approaches, on pain severity and the quality of life in cancer patients.

## Methods

### *Sampling and inclusion criteria*

In this clinical trial study, the sampling procedure was fulfilled among metastatic cancer patients of the Oncology Super-specialty Clinic of Ahvaz Golestan Hospital. Regarding ethical principles, all necessary ethical measures, including receiving the code of ethics (IR.AJUMS.REC.1397.606), the clinical trial code (IRCT20190418043314N1), and the necessary permits from the hospital, were done.

The inclusion criteria included being 18–80 years old, having a pain score of 3–10 on the Visual Analog Scale (VAS) scale, being able to perform pain self-management, having the ability to communicate, having written and reading

literacy, and also having no history of using complementary medicine approaches in the past or at present. The exclusion criteria also included the inability to participate in the study due to the disease's deterioration or death and not completing the questionnaires. In addition, the sample size was calculated using the following equation:

Reg the objectives of the study, the previous study (21), and by considering $\beta = 0.1$, $\alpha = 0.01$, $s = 1.77$, and $d = 1.5$, the sample size was calculated to be 82, using the following equation,

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 2\left(s^2\right)}{\left(d\right)^2}$$

The study participants were 75 patients from whom 35 belonged to the control group, and 40 belonged to the intervention group. They were selected based on the inclusion criteria and were then randomly assigned into the intervention or the control group using random permuted blocks with a random block size of 4, 6, 8 in line with the table of random permutations. A statistician also prepared the randomization list. The intervention used in this study was placed in sealed envelopes according to the corresponding codes by someone not included in the study that was not cognizant of the research objectives. The codes were assigned to each patient entering the study.

### Data collection tools and procedures

To gather required data, demographic and medical information questionnaires, the patient needs assessment questionnaire, and the checklists for the use of analgesics and complementary medicine approaches developed by the researcher were utilized. The EORTC core Quality of Life Questionnaire (EORTC QLQ-C30) and VAS were used in this study.

The first research instrument, that is, the demographic and medical information questionnaires, included items on age, gender, education, occupation, marital status, economic status, the duration of illness, and the type of cancer and the treatments used. The second instrument (patient needs assessment questionnaire) consisted of items to assess the patient's level of knowledge and information on the cause of pain during the disease, measuring pain severity, pharmaceutical treatments, and its complications, nonpharmaceutical therapies to relieve pain. Finally, the third instrument included analgesia and complementary medication checklists developed for each day of the week. The checklists recorded different information such as the pain severity, medication type, dose and time, and the type and frequency of applying for complementary medicine.

The questionnaire used to assess the quality of life in cancer patients (EORTC QLQ-C30) contained 30 items in 5 functional scales, including physical (5 items), role (2 items), emotional (2 items), cognitive (4 items), social (2 items), 9 symptom scales and general quality of life scale. Answers consist of *not at all*, *a little*, *quite a bit*, *very much*. To determine the quality of life, the data were classified into the three classes of good (score above 75%), relatively good (50%–75%), and poor (below 50%). The European Organization also approved the Farsi version of this questionnaire for the Research and Treatment of Cancer as a valid and reliable tool.[23] Cronbach's alpha coefficient's reliability varied from 48% to 95% for multiple-choice scales in the EORTC QLQ-C30 questionnaire. The validity and the reliability of this questionnaire were also measured by Safaei, Dehkordi, and Tabatabaie and approved as desirable (76%–93%).[23]

The VAS for pain severity was a 10-score scale, with 0 for no pain and 10 for severe pain.

In the first step, the needs assessment form was delivered to the intervention group patients to complete. Both groups completed the pain severity and the quality of life questionnaires before the intervention. Then, pain self-management education was performed in the three steps of providing information, skills development, and guidance in the intervention group. The first step was accomplished by providing information in the hospital and at the time of hospitalization. In the second step, the patients were practically trained to use the VAS scale and implement complementary medicine approaches (self-acupressure, relaxation and breathing, and imagination therapy), face-to-face and in the presence of the accompanying person. They were also taught how to perform pharmaceutical pain relief according to the standard protocol and provided feedback to the researcher. The third step, guidance, included weekly and monthly follow-up evaluation of pain severity and the quality of life.

The participants were instructed about measuring the severity of pain after discharge by using VAS to feel any pain and relieve pain using complementary medicine techniques. They were trained to follow the standard protocol if the pain persisted and pharmaceutical medication was needed. Finally, they were supposed to record pain severity in the checklist, along with the complementary method applied and the type and the dose of the medication taken.

The researcher learned how to apply complementary medicine techniques under the supervision of an experienced expert. These trainings were provided in a calm environment and the presence of the patient. The number and the length of training sessions hinged on the patient's conditions and their cooperation level. Each session lasted for approximately 2 h and consisted of face-to-face training, lectures, and practical demonstrations. Then, practical

feedback was received from the patient. During each session, the patient was given the necessary training on using complementary medicine techniques and analgesics. The patient was asked to act based on the physician's pharmaceutical protocol if the pain did not relieve using complementary medicine. Moreover, an educational pamphlet on pain self-management containing a checklist for the daily recording of pain severity, the dose of analgesia, and the frequency and type of complementary techniques used were provided to the subjects. After discharge, the researcher performed weekly telephone follow-ups during the 1st month and then every 2 weeks for 2 months to ensure that the complementary medicine techniques were performed correctly and that the checklists were filled. Pain severity was measured weekly, and the quality of life was measured 1 and 3 months after the intervention.

As with the control group, the subjects received routine training provided by the ward staff. Like the previous group, after discharge, pain severity was measured weekly, and the quality of life was measured 1 and 3 months after discharge. To observe ethical considerations, an educational pamphlet was provided to the control group at the end of the research.

In general, in the intervention group, pain self-management training was performed in three steps: giving information, creating skills, and guidance. Self-management was accomplished face to face, practical, and as feedback. After that, quality of life was measured 1 and 3 months later, and pain intensity was measured during 5 weeks. In the control group, quality of life questionnaire and also pain intensity checklist was used.

### Statistical analysis

Continuous variables were reported as mean ± standard deviation. Categorical data were expressed as number (percentage). The normality of continuous variables was also checked using Shapiro–Wilk's $W$-test. Two independent samples $t$-test or Mann–Whitney tests were run to compare the continuous variables between the two groups. Chi-square test and Fisher's exact test were also run wherever appropriate. Furthermore, generalized estimating equation (GEE) models were applied to examine the associations between type of intervention (Pain Self-Management Education and control) and change in pain and quality of life scores over time. GEE models included two main effects (the type of intervention and time) and their interaction. Statistical analysis was performed using the statistical software SPSS 18.0.0. (SPSS Inc. Chicago, IL, USA). $P < 0.05$ were also considered to be statistically significant.

## Results

Among 82 samples, 35 remained in the control group, and 40 remained in the intervention group. The main rationales for this loss in the two groups were the increased pain and the deterioration of the patient's condition, which made them reluctant to continue the study.

Table 1 shows that the independent $t$-test results indicate that there was no statistically significant difference between the two groups in terms of age ($P = 0.52$) and the number of children ($P = 0.77$). However, the Mann–Whitney test uncovered a statistically significant difference between the two groups in terms of the disease duration and the duration of treatment ($P < 0.0001$), indicating that the results might

**Table 1: A comparison of demographic and medical characteristics between the two groups (Mean±SD)**

| Demographic and medical characteristics | Intervention group | Control group | P |
|---|---|---|---|
| Age (years) | 47.80±12.23 | 46.28±8.31 | 0.52 |
| The number of children | 2.27±1.66 | 2.11±1.43 | 0.77 |
| The duration of disease | 24.67±13.46 | 30.77±9.17 | <0.0001 |
| The duration of treatment | 18.30±10.12 | 25.60±9.02 | <0.0001 |
| Gender [*n* (%)] | | | |
| Female | 22 (55) | 22 (62.9) | 0.63 |
| Male | 18 (45) | 13 (37.1) | |
| Marital status [*n* (%)] | | | |
| Single | 7 (17.5) | 9 (25.3) | 0.41 |
| Married | 33 (82.5) | 26 (74.3) | |
| Education [*n* (%)] | | | |
| Below diploma | 9 (22.5) | 3 (8.6) | 0.25 |
| Diploma | 19 (47.5) | 19 (54.3) | |
| Bachelor's degree | 12 (30) | 13 (37.1) | |
| Occupational status [*n* (%)] | | | |
| Self-employed | 11 (27.5) | 11 (31.4) | 0.67 |
| Public sector | 9 (22.5) | 10 (28.6) | |
| Housewife | 13 (32.5) | 7 (20) | |
| Retired | 7 (17.5) | 7 (20) | |
| The organ engaged [*n* (%)] | | | |
| Breast | 11 (27.5) | 10 (28.6) | 0.09 |
| Ovary | 1 (2.5) | 0 | |
| Intestine | 12 (30) | 3 (8.6) | |
| Colon | 2 (5) | 3 (8.6) | |
| Liver | 0 | 4 (11.4) | |
| Stomach | 3 (7.5) | 5 (14.3) | |
| Bone marrow | 4 (10) | 1 (2.9) | |
| Esophagus | 2 (5) | 2 (5.7) | |
| Gallbladder | 1 (2.5) | 0 | |
| Rectum | 2 (5) | 1 (2.9) | |
| Uterus | | | |
| Metastatic location [*n* (%)] | | | |
| Lung | 8 (20) | 4 (11.4) | 0.09 |
| Ovary | 2 (5) | 5 (14.3) | |
| Kidney | 5 (12.5) | 4 (11.4) | |
| Intestine | 1 (2.5) | 2 (5.7) | |
| Colon | 1 (2.5) | 1 (2.9) | |
| Liver | 6 (15) | 0 | |
| Urinary bladder | 4 (10) | 2 (5.7) | |
| Stomach | 2 (5) | 1 (2.9) | |
| Bone marrow | 2 (5) | 1 (2.9) | |
| Blood | 3 (7.5) | 1 (2.9) | |
| Esophagus | 1 (2.5) | 1 (2.9) | |
| Gallbladder | 0 | 6 (17.1) | |
| Lymph nodes | 2 (5) | 6 (17.1) | |
| City of residence [*n* (%)] | | | |
| Ahvaz | 26 (65) | 27 (77.1) | 0.50 |
| Khuzestan natives | 10 (25) | 6 (17.1) | |
| Other cities | 4 (10) | 2 (5.7) | |

be affected by confounding factors. The results of Fisher's exact test and Chi-square test also revealed that there were no statistically significant differences between qualitative variables in the patients in the intervention and control groups ($P > 0.05$).

In a similar vein, no statistically significant difference was observed between the two groups in terms of pain severity before the intervention ($P = 0.411$). Moreover, no statistically significant difference was observed in the 1st week after the intervention ($P > 0.9$). However, from the 2nd week on, the results of repeated measures ANOVA showed a significant difference between the pain severity levels in the two groups before and after the intervention ($P < 0.0001$) [Table 2].

According to the repeated measures ANOVA results, the two groups showed no significant difference in terms of analgesic use before the intervention ($P > 0.9$). However, from the first to the 7th week after the intervention, a statistically significant difference was reported in analgesic use ($P < 0.0001$) [Table 3].

Finally, before the intervention, there was no significant difference between the two groups regarding the general quality of life and its dimensions. The Friedman test results displayed that pain self-management education significantly increased the general quality of life and its dimensions in the intervention group. Repeated measures ANOVA also showed a statistically significant difference ($P < 0.0001$) between the levels of the general quality of life and its dimensions in the two groups before and after the intervention, as shown in Table 4.

## Discussion

Quality of life is an important criterion reflecting the effectiveness of health care. Identifying appropriate ways to improve the quality of life in cancer patients might develop proper approaches to mitigate the disease's undesirable effects. The results of the present study revealed that with pain self-management education, there was a significant difference between the pain severity trend (using VAS questionnaire), pain severity (using the quality of life questionnaire), and the use of analgesics in the intervention and control groups, before and after the intervention. In keeping with this, the study of John *et al.* showed that using the SCION-PAIN program reduced the mean pain severity and the number of analgesic drugs used in the intervention group.[21] Performing effective nursing interventions can mitigate pain in these patients. Pain self-management education has important clinical implications regarding the barriers to pain control in cancer patients and helps increase self-efficacy and reduce pain severity.[17]

The current study also revealed a statistically significant difference in all the areas of quality of life in the intervention

**Table 2: Comparing the mean and standard deviation of the trend of pain severity between the intervention and control groups (Mean±SD)**

| Pain severity (using VAS) | Control group | Intervention group | P* | P** |
|---|---|---|---|---|
| Preintervention | 5.71±0.51 | 5.37±0.62 | 0.411 | <0.0001 |
| 1st week after the intervention | 5.26±0.63 | 4.97±0.62 | >0.9 | |
| 2nd week after the intervention | 5.17±0.67 | 4.54±0.59 | 0.001 | |
| 3rd week after the intervention | 5.21±0.68 | 4.08±0.58 | <0.0001 | |
| 4th week after the intervention | 5.27±0.68 | 3.56±0.73 | <0.0001 | |
| 5th week after the intervention | 5.31±0.68 | 3.08±0.74 | <0.0001 | |
| 6th week after the intervention | 5.36±0.64 | 2.52±0.69 | <0.0001 | |
| 7th week after the intervention | 5.44±0.58 | 1.97±0.70 | <0.0001 | |

*P value is reported based on the comparison of mean scores of pain severity between the two groups, at different times using the GEE's pairwise comparisons in the presence of confounding factors (the disease duration, the treatment duration) and applying Bonferroni correction, **P value is reported based on the repeated measures ANOVA (the interaction effect of time×group in GEE model), in the presence of confounding factors (the duration of disease, the duration of treatment). GEE's: Generalized estimating equations, VAS: Visual analog scale, SD: Standard deviation

**Table 3: A comparison of the mean and standard deviation of the analgesic use trend between the two control and intervention groups (Mean±SD)**

| Analgesic use | Control group | Intervention group | P* | P** |
|---|---|---|---|---|
| Pre- intervention | 2.57±0.60 | 2.40±0.54 | >0.9 | <0.0001 |
| 1st week after the intervention | 2.40±0.69 | 1.72±0.55 | <0.0001 | |
| 2nd week after the intervention | 2.54±0.65 | 1.25±0.58 | <0.0001 | |
| 3rd week after the intervention | 2.05±0.72 | 0.65±0.53 | <0.0001 | |
| 4th week after the intervention | 2.00±0.76 | 0.32±0.52 | <0.0001 | |
| 5th week after the intervention | 2.11±0.75 | 0.07±0.26 | <0.0001 | |
| 6th week after the intervention | 2.02±0.82 | 0.10±0.30 | <0.0001 | |
| 7th week after the intervention | 2.05±0.72 | 0.05±0.22 | <0.0001 | |

*P value is reported based on the comparison of mean scores of analgesic use between the two groups, at different times using the GEE's pairwise comparisons in the presence of confounding factors (the disease duration, the treatment duration) and applying Bonferroni correction, **P value is reported based on the repeated measures ANOVA (the interaction effect of time×group in GEE model), in the presence of confounding factors (the duration of disease, the duration of treatment). GEE's: Generalized estimating equations, SD: Standard deviation

and control groups before and after the intervention. Koller *et al.* reported that pain-related movement limitations decreased after implementing an intervention program in terms of physical function.[16] Cancer patients need to increase their physical abilities to achieve independence. Using this intervention can help them increase their physical ability. In terms of fulfilling roles, the results of Husseini's study showed that spiritual therapy training had a significant impact on role-functioning limitations due to physical health conditions and emotional problems among breast cancer patients.[24] In terms of perceived emotional health, Koh Su-Jin *et al.* maintained that individual pain management education improved life quality's emotional aspect.[25] In cognitive health, the study by Ali Akbari *et al.* indicated that using Xbox could significantly reduce psychological symptoms, including stress, anxiety, and depression, in people with cancer.[26] In a US study in the field of social functioning, Keefe *et al.* showed

**Table 4: A comparison of the mean of the quality of life and its dimensions between the two groups at preintervention, 1-month postintervention, and 3 months postintervention (Mean±SD)**

| QOL dimensions | Preintervention | 1 month postintervention | 3 months postintervention | P* |
|---|---|---|---|---|
| Physical function | | | | |
| Control | 34.28±16.01 | 29.52±11.46 | 30.28±11.80 | <0.0001 |
| Intervention | 32.33±15.13 | 59.00±10.83 | 58.16±11.78 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Role functioning | | | | |
| Control | 34.76±23.35 | 30.95±17.21 | 25.71±16.83 | <0.0001 |
| Intervention | 37.91±24.45 | 59.58±19.93 | 61.25±19.02 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Perceived emotional health | | | | |
| Control | 33.80±17.95 | 30.47±20.20 | 21.42±12.82 | <0.0001 |
| Intervention | 37.91±13.98 | 62.91±11.62 | 64.58±14.09 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Cognitive health | | | | |
| Control | 34.28±20.18 | 32.38±22.83 | 27.14±16.70 | <0.0001 |
| Intervention | 35.41±20.39 | 66.66±22.00 | 62.50±21.50 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Social functioning | | | | |
| Control | 39.52±23.25 | 33.33±16.65 | 25.23±13.63 | <0.0001 |
| Intervention | 32.50±27.46 | 65.41±20.10 | 55.83±22.18 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Fatigue intensity | | | | |
| Control | 65.39±17.20 | 71.74±18.92 | 74.60±14.15 | <0.0001 |
| Intervention | 69.44±14.64 | 37.77±17.39 | 49.16±56.70 | |
| P** | >0.9 | <0.0001 | 0.002 | |
| Pain severity | | | | |
| Control | 67.14±20.00 | 70.95±20.34 | 78.57±14.89 | <0.0001 |
| Intervention | 63.75±18.44 | 35.41±23.31 | 37.08±16.66 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Shortness of breath severity | | | | |
| Control | 69.52±29.56 | 76.19±22.24 | 76.19±19.08 | <0.0001 |
| Intervention | 73.33±26.36 | 37.50±26.35 | 40.83±23.35 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| Sleep disturbances | | | | |
| Control | 65.71±27.39 | 66.66±26.81 | 75.23±20.36 | 0.001 |
| Intervention | 66.66±32.02 | 40.83±30.65 | 45.83±28.92 | |
| P** | >0.9 | 0.001 | <0.0001 | |
| Financial problems severity | | | | |
| Control | 56.19±32.10 | 67.61±28.56 | 75.23±23.35 | <0.0001 |
| Intervention | 63.33±30.93 | 33.33±27.21 | 40.83±23.35 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| The general QOL | | | | |
| Control | 39.76±12.47 | 51.66±12.75 | 35.71±14.93 | <0.0001 |
| Intervention | 48.12±15.38 | 77.91±13.41 | 78.33±12.90 | |
| P** | 0.233 | <0.0001 | <0.0001 | |
| The severity of nausea and vomiting | | | | |
| Control | 66.19±21.19 | 70.47±19.83 | 74.76±17.79 | <0.0001 |
| Intervention | 68.33±20.60 | 38.75±21.14 | 39.16±18.70 | |
| P** | >0.9 | <0.0001 | <0.0001 | |
| The severity of appetite loss | | | | |
| Control | 71.42±25.74 | 80.00±24.52 | 68.57±21.30 | 0.006 |
| Intervention | 63.33±30.00 | 46.66±31.84 | 38.33±33.33 | |
| P** | >0.9 | <0.0001 | <0.0001 | |

*Contd...*

| Table 4: Contd... | | | | |
| --- | --- | --- | --- | --- |
| QOL dimensions | Preintervention | 1 month postintervention | 3 months postintervention | *P*\* |
| Constipation severity | | | | |
| Control | 61.90±32.48 | 69.52±27.26 | 80.98±18.58 | <0.0001 |
| Intervention | 63.33±30.93 | 35.00±26.09 | 35.83±26.56 | |
| *P*\*\* | >0.9 | <0.0001 | <0.0001 | |
| Diarrhea severity | | | | |
| Control | 60.95±31.81 | 71.42±26.98 | 82.85±19.90 | <0.0001 |
| Intervention | 68.33±29.18 | 44.16±29.61 | 42.50±26.13 | |
| *P*\*\* | >0.9 | <0.0001 | <0.0001 | |

\**P* value is reported based on the comparison of mean scores of QOL and its dimensions between the two groups, at different times using the GEE's pairwise comparisons in the presence of confounding factors (the disease duration, the treatment duration) and applying Bonferroni correction, \*\**P* value is reported based on the repeated measures ANOVA (the interaction effect of time×group in GEE model), in the presence of confounding factors (the duration of disease, the duration of treatment). QOL: Quality of life, GEE's: Generalized estimating equation

that performing a 3-session pain management intervention by peers significantly improved the social well-being of the individuals.[27] Findings of the study Heravi Karimi *et al.* showed that group counseling promote quality of life level in patients with breast cancer treated with chemotherapy.[28] Given these points, the pain self-management model can help decrease financial problems by reducing hospitalizations and consequently, consumption costs.

It was also found in the present study that there was a statistically significant difference between the intervention and control groups before and after the intervention in terms of symptoms, including the severity of fatigue, shortness of breath, sleep disturbance, nausea and vomiting, constipation, reduced appetite, and diarrhea. This finding is consistent with those of studies by Samiei,[29] Heravi Karimi,[30] Koh Su-Jin *et al.*,[25] and Elahi Asgarabad.[31] In the study of Asgarabad, nurses performed the intervention on the mothers of cancer children undergoing chemotherapy in line with Gibson's empowerment model. The results finally indicated a significant decline in the gastrointestinal complications of the disease. It seems that educational programs based on nurses' role can reduce gastrointestinal complications in cancer patients.

Finally, the current study showed a statistically significant difference in the general area of quality of life between the intervention and control groups before and after the intervention. Koller *et al.* also showed that after an intervention, the quality of life improved in the intervention group.[16] Barandeh *et al.*, likewise, reported that self-care training in the first session of chemotherapy could not improve the quality of life in women with breast cancer.[32] It can then be concluded that more time is needed for the quality of life to be affected. In the study by Barandeh *et al.*, this time was short, but in the present study, follow-ups, and re-measurements to examine the quality of life were done in a more extended and more favorable period. Recently, Jahani *et al.*[33] conducted a study to pinpoint the impact of reflexology on the intensity of pain and anxiety among patients with metastatic cancer hospitalized in the adult hematology ward. Reflexology protocol was performed (for 3 days, 30 min per day) following the manual reflexology method by Fr Josef Eugster based on the Ingham method on the patient's bed. The study finally reported a significant difference between the mean intensity of pain before and after the treatment across all 3 days and the mean anxiety on the 1st and 3rd days. Given these results, they concluded that reflexology had a positive role in mitigating the intensity of pain and anxiety in metastatic cancer patients.

As with the study's limitations, the main one can be the point that the questionnaires were completed in different periods and their responses might be influenced by the participants' mental and psychological conditions, which was beyond the control of the researcher to monitor them.

## Conclusions

This study revealed a positive impact of pain self-management on reducing pain severity and improving the indicators of the quality of life in patients with metastatic cancer. It is then recommended that nurses, nursing students, and other healthcare team members apply these findings to effectively instruct metastatic cancer patients and their families in pain control. Empowering patients in pain self-management can reduce the costs imposed on families and the health system.

### *Conflicts of interest*

There are no conflicts of interest.

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