Original Article

Investigating the Effect of an Orem-Based Self-Care Educative Supportive Nursing System on the Quality of Life of Patients with Knee Osteoarthritis

Mohammad Behnammoghadam[1], Hamid Reza Mohammadi[2], Ardashir Afrasiabifar[1], Abolfazl Dehbanizadeh[1], Elham Talebianpour[1] and Shahla Najafi Doulatabad[3]*

1. Yasuj University of Medical Sciences, Yasuj, Iran
2. Department of Orthopedics, School of Medicine, Yasuj University of Medical Sciences, Yasuj, Iran
3. Department of Nursing, School of Nursing, Yasuj University of Medical Sciences, Yasuj, Iran

Abstract

Background: Knee osteoarthritis is an important age-related public health issue characterized by progressive loss of articular cartilage and as a result functional impairment, disability and reduced quality of life. The present study aimed to investigate the effect of an Orem-based self-care educative supportive nursing system on the quality of life in patients with knee osteoarthritis.

Methods: This semi-experimental study was conducted on 130 patients with knee osteoarthritis, who were selected as available samples and randomly assigned to the intervention and control groups. In addition to demographic characteristics, information related to patients' quality of life was collected using EQ-5D questionnaire. With the help of Oram's health status checklist, first, self-care deficiencies were determined as nursing diagnoses. Then, based on that, the educational support system that includes education, consultation and follow-up of the patients were done for the patients of the intervention group. The interventions were carried out during 6 weeks (every week a session of 45-60 *min*). Data were collected before and three months after the intervention. The data were analysed using SPSS21 software through descriptive and inferential statistics (p=0.05).

Results: The overall score of quality of life in the intervention and control groups before the intervention was 48.4±13.1 and 45.8±12.9, respectively; however, it increased to 70.2±19.4 and 61.8±17.6 after the intervention, respectively. In other words, there was a significant difference between the mean score of quality of life dimensions in the intervention and control groups after the intervention (p<0.05).

Conclusion: According to the results of this study, Orem's self-care model has had a positive significant effect on subjects' quality of life.

Keywords: Osteoarthritis, Knee osteoarthritis, Quality of life, Self-care, Orem's model

* Corresponding author
Shahla Najafi Doulatabad, PhD
Department of Nursing, Yasuj University of Medical Sciences, Yasuj, Iran
Tel: +98 9173412047
Fax: +98 81 7145 8123
Email: shahlaiss@yahoo.com

Introduction

Osteoarthritis (OA) is a degenerative joint disease and one of the main causes of disability in the elderly (1). Statistics show that more over 250 million people worldwide are suffering from the disease (2). Knee Osteoarthritis (KOA) accounts for more than 80% of the total disease burden and affects at least 19% of the American adults aged 45 years and older (3,4). In Iran, in general, out of every 10 patients over 30-35 years of age who refer with the main complaints of knee, back and neck pain, 9 people have osteoarthritis (5). Some factors are associated with an increased risk of KOA, including age, female sex, overweight or obesity, knee injury, occupational factors (such as bending the knee, lifting heavy objects, and squatting), and varus or valgus (6,7). 25% of people with knee osteoarthritis are not able to do most of their daily activities (8), thus their quality of life is affected. Also, osteoarthritis leads to significant cost and mortality (9).

There are different approaches to the treatment of osteoarthritis, and various relevant organizations have proposed guidelines for the management of OA. According to these guidelines, it is necessary to offer non-pharmacological interventions to patients with OA, and education is one of the recommended methods (10). Considering that, it is better to train the patients the principles of self-care model based on the needs of patients; therefore, Orem's self-care model could be an appropriate option (11). According to this model, self-care is a learnable behaviour that can provide many needs of the patients when they are sick or deviate from health (12). The results of a study by Begjani *et al* have shown that self-care training based on Orem's model is effective in improving the quality of life of parents of children with nephrotic syndrome (13). Furthermore, the results of a study by Khachian *et al* have demonstrated that self-management training can improve the symptoms of knee arthritis (14).

But what is certain is that, despite numerous treatment methods, OA patients continue to live with chronic pain and joint dysfunction, which reduces their quality of life and brings a lot of costs to the patients. However, still a safe solution, long-term and effective for treatment has not been identified (15). Therefore, regarding the negative impact of the disease on the quality of life of patients and the importance of self-care training for these people, and that no research was found considering the effect of this model on the quality of life of patients with knee osteoarthritis, the present study aimed to investigate the effect of supportive-educative nursing intervention based on Orem's self-care theory on the quality of life of patients with knee osteoarthritis.

Materials and Methods

This semi-experimental study was conducted on 130 patients with knee osteoarthritis who referred to Shahid Mofatteh Clinic in Yasuj city in 2022. The samples were randomly and equally selected using the convenience sampling method, and were assigned to the intervention and control groups.

The inclusion criteria were willingness to participate in the study, having osteoarthritis in one or both knees based on radiographic evidence and diagnosis of an orthopedist, the age of 40-65 years, the presence of Crepitus and Morning stiffness for less than 30 minutes, participating in any other training programs in the previous month, not using drugs, suffering from no severe chronic diseases such as lupus, and having no history of neurological disease. The exclusion criteria were the absence from more than one training session and the patients suffering from other diseases such as musculoskeletal system diseases and nervous system disorders during the intervention period.

To collect data, a researcher-made checklist and the EQ-5D questionnaire were used. The questionnaire contained five three-choice questions, each of which measures mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The questions were scored as 100, 50 and 0. A higher score indicates a higher quality of life for patients. The mean score <50, 50-75, and >75 indicated a low, moderate, and high quality of life (16).

The demographic characteristics and self-care needs were adjusted in three areas: general self-care, self-care needs during health deviations, and developmental self-care needs. Using Orem's health checklist, first, self-care deficiencies were determined as nursing diagnoses. Then, based on that, the educational support system including education, consultation and follow-ups were done for intervention group. The intervention was carried out for 6 weeks, once a week and each session lasted 45-65 *min*

individually, through lectures, questions and answers, PowerPoint, slideshow, and presenting educational pamphlets by the researcher. The training content included knowledge of knee osteoarthritis, its causes, symptoms, treatment methods, diagnostic methods, and its complications, as well as self-care measures regarding exercise, fatigue, constipation, mental and psychological disorders, dietary compliance, drug use, and side effects of drugs (Table 1).

These trainings were practiced and the patients' questions were answered. In addition to training, counselling measures such as family and career counselling, psychological support, follow-up of diagnostic and therapeutic measures and, if necessary, specialized referral were used. The control group received routine fallow up. The studied samples in both the intervention and control groups completed the questionnaires and their scores were compared before and three months after the intervention.

The collected data were analysed using SPSS 22 (IBM Corp., Armonk, New York, USA). A p-value less than 0.05 was considered for satirical significant difference. The distribution status of outcome variables was assessed prior to inferential statistic. Therefore, the result of parametric tests was reported because their of normal distribution.

Results

Based on the findings, 83.85% of the samples were female and 43.07% of them were in the age group of 40-50 years. 86.15% of them had a diploma or were illiterate. 62.3% of the samples live in the city and 49.23% of them have independent jobs. Also, 52.3% of them have health insurance. Comparison of the demographic characteristics of the two intervention and control groups showed no significant difference except for education (Table 2). Also, there was no significant difference between the two groups in terms of treatment duration, drug side effects, how to take the drug, the number of visits to the doctor, addiction, follow-up tests and background diseases ($p > 0.05$). In addition, there was a significant difference between the two groups in the mean score of mobility, personal care, daily activities, pain/discomfort and anxiety/depression after the intervention ($p < 0.05$). The mean score of the quality of life in the two groups after the intervention was significant (Table 3).

Discussion

The results of this study demonstrated a significant relationship between the two intervention and control groups in terms of quality of life after the intervention. In other words, the intervention group had a better

Table 1. Intervention protocol

1st session	The general introduction of knee osteoarthritis was discussed, including the definition of the disease, symptoms, diagnosis methods, treatment methods and complications
2nd session	The individual needs, including air, water, food, activity and rest, privacy and social interactions and prevention, were discussed
3rd session	There were solutions to deal with depression, pain, muscle cramps, walking and also to review the needs of the previous session
4th session	Dealing with ways to reduce fatigue, acceptance of illness, daily plans, prioritizing work, home environment design, use of assistive devices, showering, nutrition, fluid intake, laughter therapy, stress management, being away from anxiety and depression, pain relief, rest, adequate sleep, reduced activity level, relaxation exercises, proper nutrition with micronutrients, emotional support, massage, fun and distracting exercises, and review of the third session
5th session	In this session, exercise and mental exercises were reviewed as ways to improve motor performance and ways to reduce fatigue, as well as ways to increase physical balance, including oral exercises, designing a suitable home environment, and relaxation exercises were discussed
6th session	In the last session, by practicing self-care and how to complete the checklist, the protocol was summarized

Table 2. Comparison of the demographic characteristics of the patients in two intervention and control groups

Variables		Intervention		Control	
		N	p	N	p
Age (M±SD)		52.3±61		58.3±7.1	
Gender	Male	9	13.8	12	18.5
	Female	56	86.2	53	81.5
Living place	City	39	60	42	64.6
	Village	26	40	23	35.4
Education	Less than diploma	61	93.8	51	78.5
	Greater than diploma	4	6.2	14	21.5
Occupation	Employed	6	9.2	6	9.2
	Housewife	30	46.3	24	36.9
	Self-employed	29	44.5	35	53.9

Table 3. Comparison of the quality-of-life score in intervention and control groups before and after the intervention

Groups		Experiment		Control		Independent t-test
	Variables/Times	M	SD	M	SD	p-value
Mobility	Before intervention	40.3	7.9	40.4	7.6	0.290
	After intervention	61.2	16.3	51.7	14.4	0.001
Self-care	Before intervention	53.8	11.3	52.7	14.7	0.291
	After intervention	75.8	20.6	65.9	18.4	0.001
Daily activities	Before intervention	49.7	13.9	47.6	11.6	0.613
	After intervention	73.4	20.6	64.1	18.3	0.001
Pain/discomfort	Before intervention	45.8	12.9	46.9	14.3	0.380
	After intervention	68.3	11.6	62.7	18.9	0.001
Anxiety/depression	Before intervention	43.7	8.9	45.8	11.4	0.289
	After intervention	61.4	22	61.8	22.4	0.001
Total	Before intervention	48.4	13.1	45.8	12.9	0.263
	After intervention	70.2	19.4	61.6	17.9	0.001

quality of life compared to the control group. This was consistent with the results of studies by Nunez *et al* (17), Ariana *et al* (18), and Momeni *et al* (19). The results of a systematic review by Vitaloni *et al* represented that knee self-management programs delivered by health care professionals improved quality of life in patients with KOA (20). Also, the results of a study by Sinatti *et al* have shown that education reduces pain and improves function in patients with hip and knee OA (21).

Therefore, it can be claimed that the implementation of a comprehensive program based on the needs of patients can be effective in improving their quality of life. In the present study, all the factors affecting

the quality of life have been emphasized and caused the individual to engage in self-care, thus the quality of life has increased in all dimensions. According to the results of their systematic review, Cheraghi *et al* have recommended the implementation of a self-care program based on Orem's theory to improve the quality of life in patients (22). In this model, by encouraging patients to actively participate in the process of treatment and self-care, rehabilitation, training and various exercises, effective steps can be taken to improve the quality of life of patients despite the limitations caused by the disease, especially in chronic diseases such as osteoarthritis.

On the other hand, in explaining the results of the present study, it is possible to refer to various effective factors. Based on Orem's self-care theory, self-care is a skill that many chronic patients have the potential to learn (23). Therefore, by teaching the correct model of self-care and improving the self-care skills of patients, it is feasible to play a significant role in improving their quality of life (24).

When the implementation of the self-care program is formulated based on the self-care needs of the patients and is designed according to their knowledge, it can have positive effects on the patients' performance. Also, using models that can encourage the patient to participate in self-care can increase the quality of life. Although random assignment and having a control group were among the strengths of the present study, this research has limitations that should be considered when generalizing the findings. Among the limitations of the present study was that all the participants were outpatients. Although the trainings were provided face-to-face and followed up over the phone, the method was not without problem. Therefore, it is suggested to investigate the issue in hospitalized patients as well.

Conclusion

According to the results, Orem's self-care model can improve the quality of life of patients with knee osteoarthritis in all dimensions, therefore, it is necessary for nurses and health professionals to apply the model to control the problems of patients with KOA. Also, this model should be taught to clients in their care programs, and nursing students should be given the necessary training and emphasis on the effectiveness of this model.

Ethics approval

First, the approval of the University Ethics Committee was obtained. Then, the purpose of the study was explained to the samples and written informed consent was obtained. Also, the free exit was emphasized at every stage of the study and the confidentiality of the information.

Consent to participate

Informed consent was obtained from all the individual participants included in the study.

Consent for publication

All the authors have read and approved the final version of the manuscript.

Acknowledgement

Conflict of Interest

The authors declared no conflict of interest.

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