Effect of Self Care Program on Pain Intensity and Functional Ability of Osteoarthritis Patients

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Abstract

Context: Osteoarthritis is an intractable joint disease that is characterized by chronic pain, rigidity and functional disability with significant costs and a great impact on health and quality of life. In order to mitigate osteoarthritis patients' disability and complaints, they must adhere to optimal self-care. **Aim:** To evaluate the effect of self-care program on pain intensity and functional ability of osteoarthritis patients**. Method:** The study used a quasi- experimental design, specifically employing a pre/post-test methodology on a purposive sample of (80) patient with osteoarthritis admitted within four months to orthopedic department and orthopedic outpatient clinics at Benha University Hospital, Qualubyia Governorate, Egypt. **Tools:** Four tools were utilized for data collection: Structured interview questionnaire, osteoarthritis self-care practice scale, numeric pain rating scale and functional ability of osteoarthritis patients (Katz activities of daily living and the lawton instrumental activities of daily living scale). **Results** showed a statistically significant increase in the total patients' knowledge level both immediately and post 2 months of self-care program implementation (P ≤0.05). There was a statistically significant enhancement in the total self-care practice mean score, whereas preprogram the total mean score was 21.33 ± 7.09 indicating unsatisfactory level of practice which increased immediate and post 2 months of self-care program implementation to 37.13 ± 6.25 and 36.03 ± 6.27 respectively indicating satisfactory level of practice (P<0.001). Besides, a statistically significant difference in the total mean score of patients' functional ability according to their instrumental activities of daily living pre and post 2 months of self-care program implementation (p= <0.001). **Conclusion:** The implementation of a self-care program resulted in a significant and positive effect on the functional ability of patients and the reduced intensity of osteoarthritis pain. **Recommendations:** Further researches and studies are needed to focus on identifying new approaches of self-care practice to alleviate osteoarthritis pain intensity and enhance functional ability.

Keywords: Self-Care, Pain Intensity, Functional Ability, Osteoarthritis Patients.

Introduction:

Osteoarthritis (OA) is a painful chronic joint disorder which is triggered by a number of environmental and genetic factor and has a substantial influence on the health care industry**,** affecting one or more synovial joints such as the knee, hip, spine and hand joints especially in the elderly population **(Safari, Jackson & Sheffield, 2020).**

The main risk factors for OA including genetic alterations, sex hormone deficit and aging. As well as obesity, bone mineral density, diet, muscle weakness, joint injury, repeated significant stress, vigorous physical activity, instability and deformities of the joints **(Damgaard et al. 2023).**

Joint pain, stiffness, muscle weakness, poor balance, joint swelling, and joint instability are the primary clinical symptoms

and signs of OA, in addition to fatigue and sleep disturbances, psychological distress, as well as social constraints, including impaired quality of life, restrictions in daily activities, and limitations in employment participation **(Karateev et al. 2024).**

Furthermore, more serious complications are associated with OA, including condorolysis, osteonecrosis, stress fractures from repeated injuries, infection, bleeding inside the joint, ligament and tendon deterioration or rupture, instability, pinched nerves, and stress fractures **(Abdel-Aziz et al. 2021).**

Self-care approaches to treat OA aim to alleviate symptoms, prevent deformities, increase function and participation including not only pharmacologic and surgical modalities, but also multi-disciplinary non-pharmacological ones as patient education, heat application, exercise and self-care which are considered to be the first-line treatment and require that nurses stay up-to-date with self-care practice **(Akesson et al. 2022).**

In addition to administering medication, managing pain, monitoring disease progression, and providing patient education, nurses also aid in the diagnosis and evaluation of the disease's functional and psychosocial effects **(Basuny, Zatton & Abo- Hashem, 2020),** ensure that patients are provided with positive skills that are aimed at lifestyle change and that their care is coordinated with other health providers to maximize their outcomes, promote self-management, reduce pain, and ensure that the joint functions properly while preserving the anatomical structure **(Al Saleh et al. 2023).**

Offer patients positive skills that are focused on lifestyle change and collaborate with other healthcare providers to optimize their outcomes, promote self-management, alleviate pain, and guarantee a sufficient range of motion and joint function while maintaining the anatomical structure **(Duwao, Chintanawat & Suwankruhasn, 2022).** Patients participate in self-care programs that consist of communication with healthcare professionals, resource utilization, decision-making, and problem-solving in order to alleviate symptoms, reduce tension, increase knowledge about the disease, and attain a stable, comfortable, and healthy lifestyle. These programs encompass medical, behavioral, psychological, and emotional aspects of self-care **(Knuth, 2023).**

Significance of the study:

Osteoarthritis a chronic intractable joint disease rating the fourth most prevalent cause of chronic disability. It significantly impacts the health and quality of life of a substantial portion of the population, resulting in substantial expenses **(Ravalli et al. 2019).** Over 300 million individuals worldwide and approximately 9.6% of males and 18% of females over the age of 60 are affected by osteoarthritis, which is the most prevalent cause of morbidity **(Hartnett, Milner & DeFroda, 2023).** osteoarthritis is most prevalent disease the in Egypt that affects 5,596,869 of the total population, knee osteoarthritis is the most frequently diagnosed type of arthritis and the prevalence is expected to increase with aging and increasing obesity **(Abdel Fatah, Weheida & Mekkawy, 2019).**

Nearly 10% of the general population experience chronic joint pain, which results in distress, disability, and movement restrictions due to osteoarthritis. It is important for many patients to pay attention on the importance of disease management **(Crane et al. 2024).** As well as, from the clinical experience, observation of actual situations and according

to increased number of osteoarthritis patients, the researchers noticed that there is a decrease of functional ability among these patients at Benha university hospital. A retrospective analysis of statistical records indicated that the number of admitted patients to the orthopedic department and outpatient clinic at Benha University Hospital over the year (2023) was approximately 160 patients **(Benha University Hospital Statistical Office, 2023).**

Aim of the research:

The aim of this research was to evaluate the effect of self-care program on pain intensity and functional ability of osteoarthritis patients.

Research hypotheses:

H1: Patients' knowledge score regarding osteoarthritis could be statistically improved after implementing of self-care program.

H2: The intensity of pain experienced by osteoarthritis patients could be diminished post implementation of a self-care program.

H3: Functional ability of patients with osteoarthritis could be statistically improved post implementation of a self-care program.

Conceptual definition:

Functional ability: Refers to the patients' physical, psychological and social ability to perform the activities of daily living according to their basic needs **(Elsehrawy et al. 2023).**

Subjects and method:

Research design: Eemployed a pre/post approach in a quasi-experimental research design which is a form of empirical research that assesses the causal effect of an intervention on its intended population **(Sefidkar & Madadizadeh, 2022).**

Setting: The orthopedic department, situated on the third floor of the medical building, was the site of the research. The department comprises two patient chambers, one each for males and females. Each room contains 6 beds. As well as orthopedic outpatient clinic located in the underground floor at Benha University Hospital, Qualubyia Governorate, Egypt.

Subjects: 80 patients with osteoarthritis who were admitted to the aforementioned settings within the past four months were recruited for this study as a purposive sample. The sample size was determined using the census report from the previous year **(Benha University Hospital Statistical Office, 2023),** using the following equation:

$$\mathbf{n} = \frac{\mathbf{N} \times \mathbf{p}\,(\mathbf{1}-\mathbf{p})}{\left(\left(\mathbf{N}-\mathbf{1} \times (\mathbf{d}^{\mathbf{2}} \div \mathbf{z}^{\mathbf{2}})\right) + \mathbf{p}\,(\mathbf{1}-\mathbf{p})\right)} = \mathbf{80}$$

- N= Population size is 160.
- p= Ratio provides a neutral property of 0.12.
- d= Error rate is 0.05.
- z= Class standard responding to the level of significance of 1.96 **(Fearon et al, 2017).**

Inclusion criteria: Osteoarthritis was diagnosed in both males and females, with patients aged 20 to 60. They were both aware and committed to participating in the investigation. **While excluded** patients who have another any chronic disease and lower extremity operation to avoid effect of cofactors on results of the study. In addition to patients who have been diagnosed with psychosis or are currently receiving antipsychotic treatment with verbal disability.

Research tools:

Four tools were used to collect data pertinent to the research:

Tool I: Structured interview questionnaire: The researchers prepared this Arabic-language questionnaire after reviewing pertinent and related recent literatures based

on **(Basuny, Zatton & Abo- Hashem, 2020; Ahmed et al. 2020).** It divided into four main parts as follow:

Part 1: Patients' personal data. It involved the evaluation of patients' educational level, marital status, occupation, residence, sex, and age.

Part 2: Patients' health status to assess patient's complaints, familial history of osteoarthritis (OA), location of affected joints, duration, and stage of OA, as well as the degree of obesity by the calculation of body mass index (BMI) by evaluating body height (cm) and weight (kg).

Part 3: Pain assessment is composed of eight multiple-choice questions (MCQs) that assess the characteristics of patients' pain and stiffness. It concerns the frequency, quality and type of pain, as well as the time of pain occurrence, the effect of pain on sleep quality, the self-control trial of patients with respect to pain, the presence and frequency of joint stiffness.

Part 4: Patients' knowledge assessment: It was designed to evaluate patients' understanding of osteoarthritis and self-care programs. It consisted of 21 primary multiple-choice questions, each of which had four responses. It was divided into two sections:

Section 1: Patients' knowledge about osteoarthritis disease. It included ten multiple-choice questions (MCQs) that addressed the following topics: the definition, types, stages, causes, risk factors, manifestations, sites, methods of diagnosis, complications, and treatment methods of osteoarthritis.

Section 2: Patients' knowledge about self-care program, it consisted of (11 MCQs) about definition, purpose of self-care program, benefits and ways of joint protecting techniques, as well as appropriate diet and exercises for osteoarthritis patient.

Scoring system: - Each question of the patients' knowledge was evaluated by a score of 0 or 1. Each correct response was entitled to one score, while all incorrect responses were assigned zero score. Overall, the total score of all questions was 21. The scores were aggregated and converted to a percentage. The knowledge level was classified as satisfactory if the score was ≥70% (≥15 marks) or unsatisfactory if the score was <70% (<15 marks).

Tool II: Osteoarthritis self-care practice scale: The researchers developed it after reviewing the pertinent literatures **(Gioia et al. 2020; Hussein, Al-kotb & Ibrahim, 2022)** to assess patients' practice of self-care measures, the scale encompassed the following topics: A) Medical treatment regimen (5 items), B) Nutrition and appropriate dietary habits (8 items), C) Joint protection techniques and exercises (11 items), and D) Pain control practices (5 items).

Scoring system: - Patients were directed to assign numerical values ranging from 0 to 2 corresponding to "no," "sometimes," and "yes" when responding to items. The total score was 58 marks. These scores were converted into a percent and categorized as satisfactory level of practice at ≥60% (35 marks or more) and unsatisfactory level of practice at <60% (less than 35 marks).

Tool III: Numeric pain rating scale (0-10): This tool was adopted from **(Hjermstad, et al. 2011)** in order to evaluate the effectiveness of the self-care program in reducing the pain intensity of OA patients. This instrument is a 10 cm straight line that indicates the intensity of patients' pain with 11-point ranges from '0' representing (no pain) to '10' representing

(worst pain imaginable). The patients were asked to select number from (0-10) that best reflects their pain intensity.

Scoring system: As follows, the pain levels are represented by the values on the pain scale: The value of 0 was considered "no pain". 1-3 was considered "mild pain" (little interfering with activities of daily living). 4-6 was considered "moderate pain" (interfering significantly with activities of daily living) and 7-10 was considered "severe pain" (disabling, unable to perform activities of daily living).

Tool IV: Functional ability of osteoarthritis patients: Two instruments were used for measuring functional ability:

A) Katz Activities of Daily Living (Katz ADL): This tool was designed by **(Wallace & Shelkey, 2007)** and was adopted by the researcher. It is used for the assessment of the functional ability of OA patients by measuring the basic activities of daily living. Katz ADL index measured ability to conduct self-care. It consisted of a six-item instrument, which assessed the independence or dependence in the activities of bathing, dressing, toileting, transferring, continence and feeding.

Scoring system: Each item's score was between 0 and 1; zero for dependence and one for independence in each of the six activities. Total scores were divided into three categories ranged from 0-6 as a score of 6 indicated full function (patient independent), a score of 3-5 indicated moderate impairment and a score of 2 or less indicated severe functional impairment (patient very dependent)

B) The Lawton Instrumental Activities of Daily Living Scale (LADL): To assess OA patients' independent functional ability as well as declines and improvements over time. It adopted from **(Graf, 2008)** and measured eight items of functions through self-report including ability to use telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, responsibility for own medications and ability to handle finances.

Scoring system: Scoring followed these criteria: A score of 0 denoted for unable or less able and a score of 1 denoted for more able. The scores of the items were summed-up to be scored from zero (low function dependent) to eight (high function independent).

Self-care practice educational booklet:

After an extensive literature review, the researchers designed educational booklet based on **(Alhamo, Weheida & Abdel-Naby, 2019; Mohammed, Soliman & Mohammed, 2023).** In accordance with the educational requirements of the patients that were identified during the pretest phase, the program was designed in a simple Arabic language with colorful illustrations that addressed all theoretical and practical aspects of the research in order to enhance their learning abilities. It contained definition, types, stages, causes, risk factors, manifestations, sites, methods of diagnosis, complications, treatment methods of osteoarthritis, in addition to definition, purpose of self-care program, benefits and ways of joint protecting techniques, appropriate diet and exercises for osteoarthritis patient. As well as practical skills included self-care practices related to medical regimen for treatment, nutrition and correct diet patterns, joint protection technique and exercises as well as pain control practices.

Validity of the tools:

The tools were evaluated by a panel of seven professionals from the Medical and Nursing fields. Three professors and two assistant professors of medical surgical

nursing from Faculty of Nursing, Benha University and two professors of orthopedic from Faculty of Medicine, Benha University to ensure the comprehensiveness, clarity, consistency, appropriateness, relevance, accuracy, simplicity, applicability and the proposed suitability of tools' content.

Reliability of tools:

It was examined using the **Cronbach alpha test**, resulting in values of 0.575 for the knowledge questionnaire and 0.626 for the practice scale.

Ethical and administrative considerations:

The study first received initial authorization from the Scientific Research and Ethics Committee of the Faculty of Nursing at Benha University **(Code no. REC-MSN-P 74)** on 4/9/2024. Following this, official endorsements were obtained from the dean of the nursing faculty, the director of the orthopedic department, and the director of the orthopedic outpatient clinics at Benha University Hospital. Throughout the research process, all ethical guidelines were strictly adhered to. The study's aim and objectives were communicated to each patient, along with their freedom to discontinue participation at any moment. Patients who took part in the research gave further verbal consent. Researchers ensured the privacy and anonymity of their participants.

Pilot study: The pilot study which utilized ten % of the sample size which included eight patients was conducted to assess the usefulness, applicability, clarity and execution time of the tools. Required modifications were implemented subsequent to the pilot study's data analysis. Thus, the preliminary study participants were excluded from the study sample and substituted with others.

Field work: The collection of data spanned four months from the beginning of September 2024 to the end of December 2024. During this period, researchers visited the designated study settings twice a week during the morning and afternoon shifts hours, using the established data collection tools. The study was conducted through four stages: assessment, planning, implementation and evaluation.

A. Assessment phase: During this phase, the researchers firstly gave the patients a brief explanation of the study's aim along with an introduction. The researchers met each patient separately to assess his/her personal data, health status, pain characteristics and knowledge through a structured interview questionnaire (Tool I), then the researchers assessed patients' self-care practices using (Tool II), pain intensity level using a standardized 0-10 numeric pain rating scale (Tooll III) and functional ability of osteoarthritis patients by using Katz activities of daily living (Katz ADL) and the Lawton instrumental activities of daily living scale (LADL) (Tool IV). This phase took about 60 minutes and the researchers helped patients to complete the assessment by reading the questions to them.

B. Planning phase: Following the conclusion of the initial assessment, the researchers designed a self-care program based on recent literatures and produced an educational booklet featuring illustrations in a simple Arabic language that were pertinent to the requirements of osteoarthritis patients. A teaching plan was established by the researchers to address the program's general and specific objectives. In addition, the instructional media, various teaching strategies, the number of sessions, their duration and contents were determined. In an effort to reduce pain intensity and improve

functional ability of osteoarthritis patients, the self-care program was implemented.

C. Implementation phase: Each osteoarthritis patients were planned to present **three sessions "two theoretical and one practical sessions"** of selfcare program that included face to face group, each session lasted between twenty and thirty minutes. The proposed self-care program was implemented in the examination room of the orthopedic outpatient clinic and in orthopedic department. To obtain pertinent data, patients were divided into ten groups, each of which contained eight patients. The first session commenced with an introduction to the self-care program and its objectives. Each session started with a review of the previous session and the objectives of the new session, taking into consideration the use of simple Arabic language to suit the educational level of the patients. In order to facilitate the patient's active engagement in the educational sessions, motivation, problem-solving, encouragement and reinforcement strategies were used during the session. In addition, a comment was given and questions were answered. Each patient received the self-care educational booklet upon its completion and the researchers informed the patients that they will be evaluated by them.

Session 1: The researchers initiated the session by introducing themselves and discussing the self-care program, its objectives and importance. The session covered the definition, types, stages, causes, risk factors, manifestations, sites, methods of diagnosis, complications and treatment methods of osteoarthritis.

Session 2: Covered definition, purpose of self-care program, benefits and ways of joint protecting techniques, as well as appropriate diet and exercises for osteoarthritis patient.

Session 3: Contained self-care practices related to medical regimen for treatment, nutrition and correct diet patterns, joint protection technique and exercises as well as pain control practices.

D. Evaluation phase: Using the same data collection tools of the pretest, this phase sought to evaluate the effect of the self-care program on the functional ability and pain intensity of osteoarthritis patients (Tool I "part IV", Tool II, Tool III &Tool IV). This was conducted twice; the first time was executed immediately, and the second time was executed two months after the self-care program implementation to compare changes in knowledge, self-care practices, pain intensity and functional ability among studied osteoarthritis patients. To evaluate each patient during this phase, either a follow-up appointment was scheduled on the same day or telephone calls were made.

Statistical analysis of the data:

Using SPSS, version 25, data were entered into the computer, which then digitalized, structured, categorized, organized and analyzed. Numerical data were expressed as mean, standard deviation (SD) and range. Qualitative data were expressed as frequency and percentage. Various statistical tests were employed, including Chi-square test was used to examine the difference between qualitative variables, and the paired t-tests for comparing the mean scores between two different periods within the same group. Correlation between different numerical variables was tested using Pearson product-moment correlation coefficient and spearman correlation for categorical variables. Significance levels were determined as highly significant for $p \leq 0.001$, significant for $p \leq 0.05$, and not significant for $p > 0.05$.

Results:

Table (1) indicates the personal data of the studied patients, showing that 40% of them had an average age of 39.40 ± 0.86 that ranged between 30-<40 years, as well as 65% & 60% were educated females, respectively, 40% were married housewives and 60% were live in urban areas.

Based on their health status, **Table (2)** shows that 35% of the studied patients were complaining from joint pain, 55% had a previous family history for osteoarthritis, while 50% & 45% of them were suffered from the third stage of osteoarthritis for >5 years respectively, also 35% were obese**.**

Figure (1) provides an evidence that 37% of the studied patients had bilateral knee affection, 25% exhibited bilateral shoulder affection pertaining to the upper limb and one knee affection pertaining to the lower limb, respectively. Comparatively, 8.3% of patients exhibited affection on both sides of their wrists, fingers, neck, and upper back.

Table (3) shows that 65% & 30% of the studied patients had continuous sharp pain respectively, 40% reported that pain occurred in the morning and lasted for 10 - <30 minutes among 60% of them. As well as 55% of the studied patients said that their sleep always affected by pain and had analgesics to controll their pain, respectively. Moreover 70% reported presence of joint stiffness and 45% of them experienced stiffness every day.

Table (4) demonstrates that the knowledge level of the studied patients regarding osteoarthritis and self-care was statistically significant different pre and post the implementation of the self-care program (p= <0.001*).

Table (5) indicates that the total patients' self-care practice level was highly statistically significant different pre and post self-care program implementation (p= <0.001*).

Table (6) reveals that 39.5% and 34.6% of the studied patients experienced moderate and severe pain pre self-care program implementation, respectively. However, 48.1% and 42% of them experienced mild and moderate pain post 2 months of program implementation. In addition, the patients' total pain score exhibited significant differences between pre and post 2 months of self-care program implementation (p= <0.001*).

Table (7) shows that 70 % and 60% of the studied patients were dependent in continence and bathing pre self-care program implementation, respectively, but improved to be independent in 67.5% and 72.5% of them regarding the same items, respectively. Moreover, 87.5% were independent in feeding and toileting post 2 months of self-care program implementation with high statistically significant differences regarding the total patients' dependence level of daily living activities pre and post 2 months of self-care program implementation (p= <0.001*).

Figure (2) illustrates that 65% and 30% of the patients in the study had moderate and severe functional impairments pre self-care program implementation, respectively. However, 57.5% of the patients were able to achieve full function, while 38.8% of them experienced moderate functional impairment post 2 months of self-care program implementation.

Table (8) demonstrates a statistically significant difference in the total mean score between pre and post 2 months of self-care

program implementation in relation to the studied patients' functional ability according to their instrumental activities of daily living (p= <0.001*).

Table (9) reveals that there was a significant positive correlation between total knowledge with total self-care practice, dependence and functional level of daily living activities. However, there was a negative significant correlation between pain intensity with total knowledge, self-care practice, dependence and functional level of daily living activities as well. (p=≤ 0.001)

Table (1): Frequency distribution of studied patients according to their personal data (n= 80).

Patients' personal data	(n=80)	
	(No.)	%
Age		
- 20-<30	12	15
- 30- < 40	**32**	**40**
- 40-<50	28	35
- 50-60	8	10
Mean ± SD	**39.40 ± 0.86**	
Sex		
-Male	32	40
-Female	**48**	**60**
Educational level		
- Educated	**52**	**65**
- Un educated	28	35
Marital status		
-Single	20	25
-Married	**32**	**40**
-Divorced	16	20
-Widowed	12	15
Occupation		
- Employed	28	35
-Unemployed	20	25
-Housewife	**32**	**40**
Residence		
-Rural	32	40
-Urban	**48**	**60**

Table (2): Frequency distribution of studied patients according to their health status (n=80).

Patients' health status	(n=80)	
	(No.)	%
Patients' complaints		
- Joint pain	**28**	**35**
- Swelling	8	10
- Movement restriction	20	25
- Stiffness	8	10
- Crepitus	16	20
Family history of osteoarthritis		
-Yes	**44**	**55**
-No	36	45
Duration of osteoarthritis		
-< 3 years	20	25
-3-5 years	24	30
- >5 years	**36**	**45**
Stage of osteoarthritis		
- Second	12	15
- Third	**40**	**50**
- Fourth	28	35
Body mass index		
-Underweight	12	15
-Normal weight	16	20
-Overweight	20	25
- Obese	**28**	**35**
- Morbid obese	4	5

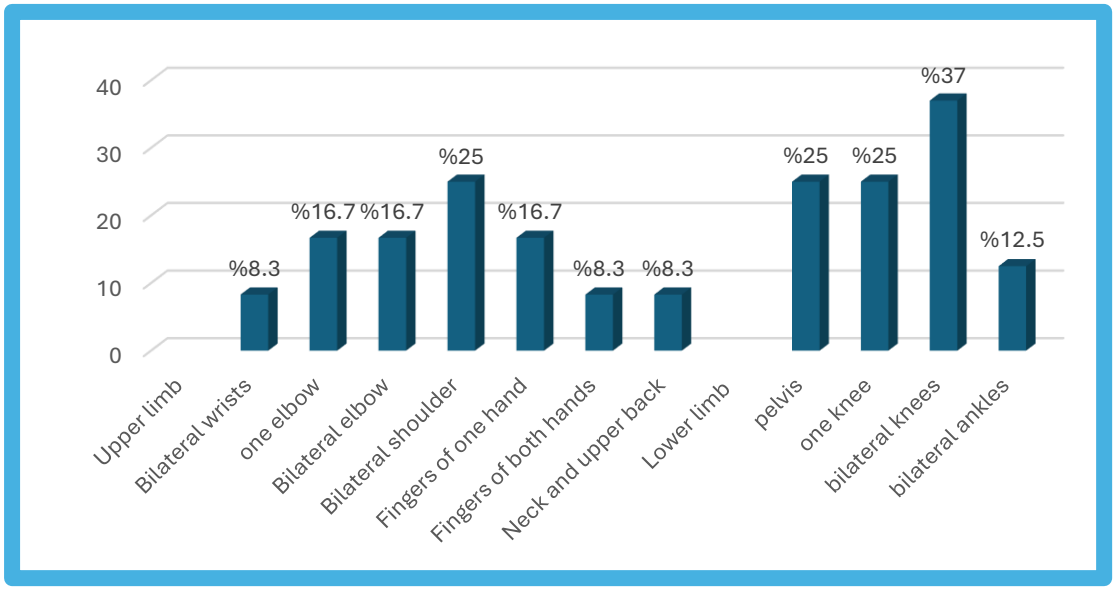


Figure (1): Frequency distribution of studied patients according to the location of affected joints in upper and lower limbs (n=80).

Table (3): Frequency distribution of studied patients regarding their pain characteristics assessment (n=80).

Pain characteristics assessment	(n=80)	
	(No.)	%
Quality of pain		
- Burning	20	25
- Tingling	16	20
- Sharp	**24**	**30**
- Acute stabbing	4	5
- Squeezing	8	10
- Aching	8	10
Frequency of pain		
- Continuous	**52**	**65**
- Intermittent	28	35
The time of pain occurrence		
- In the morning	**32**	**40**
- At night	12	15
- After performing daily activities	16	20
- During and after stairs climbing and descending	20	25
Pain duration		
- 10-<30 min	**48**	**60**
- 30min- 1 hour	32	40
Effect of pain on sleep quality		
- Sometimes affect	36	45
- Always affect	**44**	**55**
Patient's self-control trials to pain		
- Take analgesics	**44**	**55**
- Make massage	24	30
- Apply compresses	12	15
Presence of joint stiffness		
- Yes	**56**	**70**
- No	24	30
Frequency of joint stiffness		
-Every day	**36**	**45**
- Sometimes	28	35
-Intermittent	16	20

Table (4): Frequency distribution and significant difference of the studied patients' knowledge level regarding osteoarthritis and self-care pre and post self-care program implementation (n=80).

Patients' knowledge level	Pre program		Post program				X^2 (p value) (1)	X^2 (p value) (2)
			Immediate post program		Post 2 months of program			
	No.	%	No.	%	No.	%		
Osteoarthritis knowledge								
Satisfactory level ≥ 70%	9	11.3	57	71.3	52	65	7.117 0.008*	4.470 0.034*
Unsatisfactory level < 70%	71	88.7	23	28.7	28	35		
Self-care knowledge								
Satisfactory level ≥ 70%	12	15	60	75	57	71.3	4.706 0.030*	5.697 0.017*
Unsatisfactory level < 70%	68	85	20	25	23	28.7		
Total knowledge level								
Satisfactory level ≥ 70%	8	10	55	68.8	50	62.5	8.042 0.005*	6.241 0.012*
Unsatisfactory level < 70%	72	90	25	31.2	30	37.5		

(*) Statistically Significant at ≤0.05
(1) Difference between pre and immediate post periods of program
(2) Difference between pre and post 2 months periods of program

Table (5): Frequency distribution, mean, standard deviation and significant difference of the studied patients' practice level regarding self-care practice pre and post self-care program implementation (n=80).

Self-care practice	Pre-program (n=80)	Post program					X^2 (p value) (1)	X^2 (p value) (2)
		Immediate post program (n=80)			Post 2 months of program (n=80)			
	Satisfactory ≥ 60%	Unsatisfactory < 60%	Satisfactory ≥ 60%	Unsatisfactory < 60%	Satisfactory ≥ 60%	Unsatisfactory < 60%		
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)		
Medical regimen for treatment	16(19.8)	65(80.2)	54(66.7)	27(33.3)	49(60.5)	32(39.5)	9.969 0.002*	13.021 <0.001**
Nutrition and correct diet patterns	19(23.5)	62(76.5)	**66(81.5)**	15(18.5)	**59(72.8)**	22(27.2)	5.641 0.018*	9.256 0.002*
Joint protection techniques and exercises	12(14.8)	**69(85.2)**	63(77.8)	18(22.2)	57(70.4)	24(29.6)	4.025 0.045*	5.931 0.015*
Pain control practices	12(14.8)	**69(85.2)**	56(69.1)	25(30.9)	50(61.7)	31(38.3)	6.289 0.012*	8.734 0.003*
Total self-care practice	7(8.8)	73(91.2)	49(61.2)	31(38.8)	44(55)	36(45)	6.276 0.012*	4.853 0.028*

(*) Statistically significant at ≤0.05 (**) Highly statistically Significant at ≤0.001
SD: Standard deviation
(1) Difference between pre and immediate post periods of program
(2) Difference between pre and post 2 months periods of program

Table (6): Frequency distribution, mean, standard deviation and significant difference of the studied patients regarding the pain intensity using the numeric pain rating scale pre and post 2 months of self-care program implementation (n=80).

Pain intensity	Pre- program		Post 2 months of program		X^2 (p value)
	No.	(%)	No.	(%)	
None	0	0.0	2	2.5	51.008 <0.001**
Mild (1-3)	21	25.9	39	**48.1**	
Moderate (4-6)	32	**39.5**	34	**42**	
Severe (7-10)	28	**34.6**	6	7.4	
Mean ±SD.	5.34 ± 2.29		3.41 ± 1.67		T=9.550 <0.001**

SD: Standard deviation

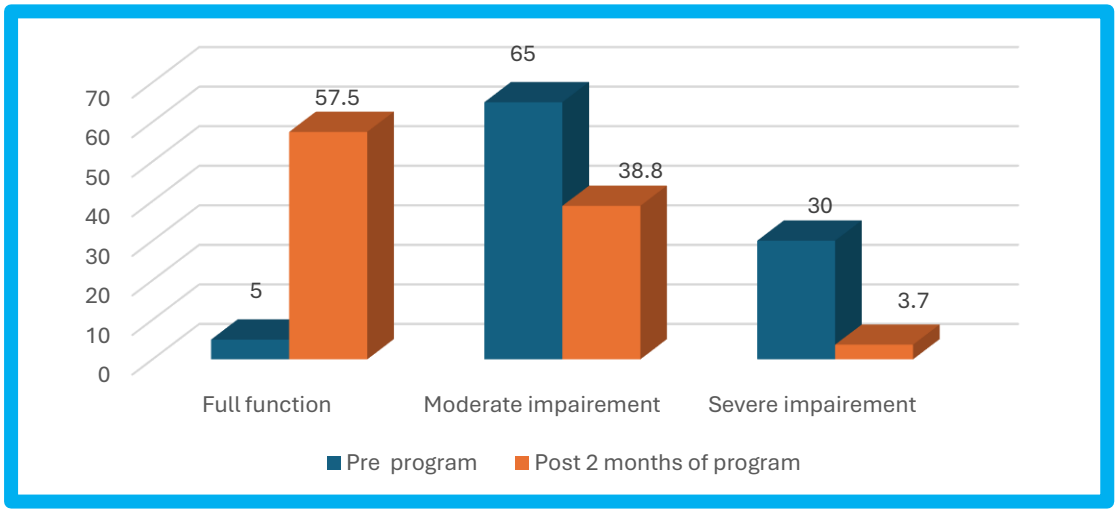
(**) Highly statistically significant at ≤0.001

Table (7): Frequency distribution and significant difference of the studied patients regarding their dependence level of daily living activities pre and post 2 months of self-care program implementation (n=80).

Dependence level of daily living activities	Pre- program				Post 2 months of program				X^2	(p value)
	Independence		Dependence		Independence		Dependence			
	No.	(%)	No.	(%)	No.	(%)	No.	(%)		
Bathing	32	40	48	**60**	58	**72.5**	22	27.5	20.230	<0.001**
Dressing	36	45	44	55	62	77.5	18	22.5	19.003	<0.001**
Toileting	44	55	36	45	70	**87.5**	10	12.5	13.968	<0.001**
Transferring	40	50	40	50	61	76.3	19	23.8	24.918	<0.001**
Continence	24	30	56	**70**	54	**67.5**	26	32.5	16.508	<0.001**
Feeding	39	48.8	41	51.2	70	**87.5**	10	12.5	10.871	0.001**
Total **(Mean ± SD.)**	2.68 ± 1.30				4.68 ± 1.62				T=-8.548	<0.001**

SD: Standard deviation

(**) Highly statistically significant at ≤0.001



(**) Highly statistically Significant at ≤0.001

Figure (2): Percentage distribution of the studied patients' total dependence level of daily living activities pre and post 2 months of self-care program implementation (n=80).

Table (8): Mean, standard deviation and significant difference of the studied patients' functional ability regarding their instrumental activities of daily living pre and post 2 months of self-care program implementation (n=80).

Patients' functional ability regarding their instrumental activities of daily living	Pre- program	Post 2 months of program	T test P value
	Mean ± SD	Mean ± SD	
Ability to use telephone	0.45 ± 0.50	0.61 ± 0.49	-3.915 (<0.001) **
Shopping	0.30 ± 0.46	0.53 ± 0.50	-4.960 (<0.001) **
Food preparation	0.40 ± 0.49	0.60 ± 0.49	-4.444 (<0.001) **
Housekeeping	0.40 ± 0.49	0.60 ± 0.49	-4.444 (<0.001) **
Laundry	0.25 ± 0.43	0.55 ± 0.50	-5.819 (<0.001) **
Mode of transportation	0.35 ± 0.47	0.61 ± 0.49	-5.303 (<0.001) **
Responsibility for own medications	0.45 ± 0.50	0.63 ± 0.48	-4.270 (<0.001) **
Ability to handle finances	0.40 ± 0.49	0.73 ± 0.44	-6.344 (<0.001) **
Total	**3.00 ± 1.19**	**4.88 ± 2.71**	**-6.922 (<0.001) **

SD: Standard deviation
(**) Highly statistically Significant at ≤0.001

Table (9): Correlation coefficient between patients' total knowledge and total self-care practice with pain intensity, dependence and functional level of daily living activities post 2 months of program implementation(n=80).

Variables	Total knowledge		Total practice		Pain intensity	
	r	P value	r	P value	r	P value
Total knowledge	-	-	-	-	-0.885	<0.001**
Total self-care practice	0.916	<0.001**	-	-	-0.489	<0.001**
Dependence level of daily living activities	0.254	0.023*	0.902	<0.001**	-0.236	0.035*
Functional level of daily living activities	0.489	<0.001**	0.223	0.047*	-0.235	0.036*

* Statistically significant p ≤ 0.05
** Highly statistically significant p ≤ 0.001

Discussion:

Self-care practice is considered a primary form of care for patients with osteoarthritis and has a proactive role in maintaining physical function, health status and quality of life (QOL). A key factor in successful management of OA is the involvement of patients for correct self-care practices **(Mohammed, Soliman & Mohammed, 2023).**

Regarding the personal data of the patients. The current study's results demonstrated that less than half of the participants were married housewives, and their age ranged from 30-40 years old, with a mean age of 39.40 ± 0.86. Additionally, more than half of them were females and were resided in urban areas. These findings are consistent with what was reported by **Basuny, Zatton & Abo- Hashem (2020)** who studied responsiveness of pain and associated health issues of patients with knee osteoarthritis to the revulsive compresses, that the mean ± SD age of the patients was 45.46±7.43 years, with three-quarters of them being over the age of 30, the majority were married and most of them were females. In addition, over two-thirds of the patients were housewives. Conversely, they contradicted the notion that over two-thirds of them resided in rural areas.

These findings agree with those of **Jokar et al. (2024)** in a study titled self-care education on the pain, quality of life, and consequences of disease in patients with knee osteoarthritis, demonsterated that less than half of the patients were housewives, nearly three-quarters were females, and nearly two-thirds were married and residing in urban areas. However, the age of the patients was contradicted, as nearly two-thirds of them were under the age of 60. Additionally, these results are consistent with **Shalhoub et al. (2022)** who conducted a study about the impact of pain on quality of life in patients with osteoarthritis: a cross-sectional study from Palestine, and indicated that nearly two thirds of participants were not worked females, the majority of them their age was ≥40 years old, two thirds were married and less than half of them were living in urban areas.

In relation to patients' complain, this research demonstrated that over one-third of the studied patients were complaining from

joint pain. In a similar vein, a pilot study conducted by **Vitaloni et al. (2020)** which entitled a patients' view of OA: the global osteoarthritis patient perception survey (GOAPPS), they reported that most of their participant patients were suffering from joint pain and tenderness.

Concerning stage of osteoarthritis, the current study revealed that half of the studied patients were suffered from the third stage of osteoarthritis. This finding is contradicted with **Ishfaq et al. (2023)** who studied self-care ability among elderly patients with osteoarthritis, and found that nearly two fifths of participants were suffering from grade II of osteoarthritis.

Related to location of affected joints in upper and lower limbs, the present study demonstrated that over one-third of patients had bilateral knee affection. Likewise, in a study conducted by **Larsen et al. (2022)** who reported that more than one third of patients had bilateral knee osteoarthritis which entitled five- year follow-up of patients with knee osteoarthritis not eligible for total knee replacement: results from a randomized trial. On contrary, **Arslan et al. (2024)** who mentioned that most of their participants had unilateral knee complaints in a study about patterns of knee osteoarthritis management in general practice: a retrospective cohort study using electronic health records.

Pertaining to quality, frequency, duration and time of pain occurrence, the current study revealed that nearly two thirds and less than one third of the studied patients had continuous sharp pain that occurred in the morning for 10 - <30 minutes among less than half and less than two thirds of them respectively. These findings disagree with **Ahmed et al. (2020)** who studied effect of physical exercise and heat application on pain and morning stiffness in osteoarthritis patients, and showed that the majority of patients had intermittent pain that lasted for 10 ≥ 35 minutes and less than half of them had piercing character of pain that occurred with movement.

Considering the studied patients' knowledge, the current study found that there were high statistically significant differences between pre and post self-care program implementation. The lack of time or inadequate information provided by healthcare providers to patients could be to blame. This finding supports the first research hypothesis. Consistent with previous findings, **Mohsen et al. (2021)** who studied the effect of nursing intervention on knowledge and practice among elderly with knee oosteoarthritis, and noted that there was a highly significant improvement in total knowledge score level of the studied patients before and after nursing intervention.

Similarly, a study done by **Kotb et al. (2024)** about implementation of exercises functional program on knee osteoarthritis in women, and mentioned that there was a statistical significance difference of all items of knowledge assessment in pre and post implementation of program. This could be due to the training program's good impact on patients' knowledge of osteoarthritis and self-care.

In relation to studied patients' self- care practice, total patients' self-care practice levels differed significantly pre and post self-care program implementation. This may be returned to improvement in both knowledge and practice. In agreement with this finding is a study done by **Fereidouni et al. (2024)** about the effect of an educational intervention based on the theory of planned behavior on the prevention of knee osteoarthritis in

women, whose findings revealed statistically significant differences between the studied groups regarding their self- care practice scores. Likewise, **Mohamed & Ali (2021)** who studied effect of designed nursing intervention protocol on outcomes of patients with symptomatic knee osteoarthritis, and reported that there was highly statistically significant difference between patients' practices regarding osteoarthritis management pre/post implementation of the nursing intervention protocol.

Regarding pain intensity, this research showed high statistically significant differences pre and post 2 months of self-care program implementation in relation to the patients' total pain score. This finding supports the second research hypothesis. Similarly, **Moutzouri et al. (2024)** who studied effectiveness of a web-guided self-managed telerehabilitation program enhanced with outdoor physical activity on physical function, physical activity levels and pain in patients with knee osteoarthritis: A randomized controlled trial, and stated that there was a significant difference between the studied groups for pain intensity post-intervention assessments compared to baseline ($p < 0.005$). Moreover, **Jokar et al. (2024)** who mentioned that statistically significant difference was found between the intervention group regarding pain intensity after the self-care educational intervention rather than before.

Regarding the studied patients' functional ability according to their instrumental activities of daily living, the present research stated that pre and post two months of self-care program implementation, there was a highly statistically significant difference in relation to the total mean score. This finding supports the third research hypothesis and is in line with **Talebianpoor et al. (2024)** whose results showed significant differences between the studied groups' functional ability regarding their activities of daily living pre and post intervention. Their research focused on investigating the effect of an orem-based self-care educative supportive nursing system on the joint function of patients with knee osteoarthritis. As well as **Gavin et al. (2024)** who studied the impact of occupational therapy on the self-management of rheumatoid arthritis: A mixed methods systematic review, and found that the program improved the studied patients' functional ability.

Concerning correlation between patients' total knowledge and total self-care practice, the current research indicated a significant positive correlation between the total knowledge of patients and their total self-care practice. This finding is consistent with **Elsayed, Ahmed & Mohamed (2023)** whose research entitled patients' knowledge and practices toward osteoarthritis disease, and concluded that there was a positive correlation between patients' knowledge and their practices related to osteoarthritis disease.

Conclusion:

The present study concluded that self-care program showed a statistically significant increase in the total patients' knowledge level both immediately and and post 2 months of self-care program implementation, also it had a positive and significant effect in reducing the osteoarthritis pain intensity and improving functional ability of patients, that confermed the research hypotheses. Additionally, a high positive significant correlation between total knowledge with total self-care practice, dependence and functional level of daily living activities, also a positive significant correlation between total self-care practice with dependence and functional level of daily living activities

Recommendations:

The current study recommended the following:

- Further researches and studies are needed to focus on identifying new approaches of self-care practice to alleviate osteoarthritis pain intensity and enhance functional ability.

- Replicating the current study on a larger probability sample from different geographical distribution to achieve wider generalization of the results.

- Hold an ongoing educational and orientation program for osteoarthritis patients to enhance their understanding of the disease and its management, as well as to encourage them to engage in a high level of self-care and follow-up.

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تأثير برنامج الرعاية الذاتية على شدة الألم والقدرة الوظيفية لمرضى هشاشة العظام

سماح السيد غنيم - هانم سعد محمود - إيمان جمال أحمد

هشاشة العظام هو مرض مفصلي مستعصي يتميز بالألم المزمن والصلابة والإعاقة الوظيفية ذو تكاليف باهظة وتأثير كبير على الصحة وجودة الحياة. من أجل التخفيف من إعاقة وشكاوى مرضى هشاشة العظام، يجب عليهم الالتزام بالرعاية الذاتية المثلى. هدفت الدراسة الي تقييم تأثير برنامج الرعاية الذاتية على شدة الألم والقدرة الوظيفية لمرضى هشاشة العظام. حيث استخدمت الدراسة التصميم شبه التجريبي باستخدام منهجية الاختبار القبلي/البعدي على عينة غرضية مكونة من (٨٠) مريضًا مصابًا بهشاشة العظام خلال أربعة أشهر في قسم العظام والعيادات الخارجية بمستشفى بنها الجامعي، محافظة القليوبية، مصر. تم استخدام أربع أدوات لجمع البيانات: استبيان المقابلة للمرضي، مقياس ممارسة الرعاية الذاتية لهشاشة العظام، مقياس تصنيف الألم الرقمي والقدرة الوظيفية لمرضى هشاشة العظام. أظهرت النتائج زيادة ذو دلالة إحصائية في المستوى المعرفي الإجمالي للمرضى بعد تنفيذ برنامج الرعاية الذاتية مباشرة وبعد شهرين .($P \leq 0.05$) هناك تحسن كبير إحصائيا في إجمالي ممارسة الرعاية الذاتية في حين أن متوسط الدرجات الاجمالية قبل البرنامج كان ٢١,٣٣ ± ٧,٠٩ مما يشير إلى مستوى غير مرض من الممارسة لكنها زادت بعد تنفيذ برنامج الرعاية الذاتية مباشرة وبعد شهرين إلى ٣٧,١٣ ± ٦,٢٥ و٣٦,٠٣ ± ٦,٢٧ على التوالي مما يشير إلى مستوى مرضٍ من الممارسة . ($P<0.001$)إلى جانب ذلك، هناك فرق ذو دلالة إحصائية في متوسط النتيجة الاجمالية للقدرة الوظيفية للمرضى وفقًا لأنشطتهم الفعالة في الحياة اليومية قبل وبعد شهرين من تنفيذ برنامج الرعاية الذاتية ($P<0.001$).استنتجت الدراسة أن تطبيق برنامج الرعاية الذاتية أدى إلى تأثير كبير وإيجابي على القدرة الوظيفية للمرضى وانخفاض شدة آلام هشاشة العظام. وأوصت الدراسة بأن هناك حاجة إلى مزيد من الأبحاث والدراسات للتركيز على تحديد أساليب جديدة لممارسة الرعاية الذاتية للتخفيف من شدة آلام هشاشة العظام وتعزيز القدرة الوظيفية.