Instructional Guidelines on Selected Health Outcomes among Elderly with Knee Osteoarthritis

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Abstract:

Background: Knee osteoarthritis is common in elderly people, and causes pain, loss of physical functioning, and disability**.** Elderly patients with knee osteoarthritis have relatively poor health-related quality of life, manifested mainly by pain. **Aim:** This study aimed to evaluate the effect of instructional guidelines on selected health outcomes among the elderly with knee osteoarthritis. **Research Design:** A quasi-experimental design was utilized to conduct the current study. **Settings:** This study was conducted at the rehabilitation units of three hospitals (Souad Kafafi University Hospital, Al Sheekh Zayeed Hospital and Central 6th October Hospital). **Subjects:** A purposive sample of 80 patients diagnosed with knee osteoarthritis. **Tools for data collection:** Two tools were used for data collection. **Tool I:** A structured interview or self-administered questionnaire to assess patients' demographic data and health status; **Tool II:** Knee Injury and Osteoarthritis Outcome Score (KOOS) to assess patient-relevant outcomes following a knee injury. **Results:** This study revealed that; 43.7% of the study subjects were between 60 to <70 years with a mean age of 68 ± 1.367, and 60.2% were males. There was a highly statistically significant difference between patients' osteoarthritis outcome scores pre/post implementation of the instructional guidelines in all items except fully bending of the knee, going up or down stairs, knee stiffness after waking in the morning and ascending stairs. However, there was marked improvement post-implementation of the instructional guidelines. **Conclusion:** Designed and implemented instructional guidelines had a positive effect on improving selected health outcomes among the elderly with knee osteoarthritis **Recommendation:** Develop and apply similar instructional guidelines for studying more health outcomes among the elderly with knee osteoarthritis.

Keywords: Elderly, Knee osteoarthritis, Instructional guidelines.

Introduction

Knee osteoarthritis (OA) is a common degenerative disease, its prevalence among the elderly rises to as high as 40%. osteoarthritis usually affects weight-bearing joints, the most affected joints are the knees, it is the most common type of arthritis diagnosed that leads to the breakdown of the joints' bones and cartilage with loss of articular cartilage tissue **(Springer, 2019)**. Moreover, it is a painful and disabling inflammatory disease of the knee joints, caused by multiple factors such as joint injury or abuse, being overweight, and heredity factors, **(Ahmed et al., 2022).**

Besides the high costs of health care, knee OA has a negative effect on the elderly, it could have activity restrictions, which generally affect the elderly quality of life **(El Miedany & Elwakil, 2023),** and may lead to social isolation, increase psychological stress, cognitive decline, difficulty in mobility, and sleep problems. Furthermore, it may lead to an increased

prevalence risk of other complications including diabetes, elevation in blood pressure, and cardiac disease **(Khachiana et al., 2020).**

The most common symptoms of knee OA in elderly patients include pain during walking, climbing stairs, or even at rest, stiffness in the knee joint particularly after periods of inactivity, swelling around the knee joint **(El Miedany & Elwakil, 2023),** may also, cracking or popping sounds in the knee joint when moving, limited range of motion in walking or standing up from a seated position, leading to difficult in performing activities of daily living **(Roos &Arden, 2016).**

Treatment protocols included a combination of pharmaceutical and non-pharmaceutical therapy, the drug therapy is likely to have high costs and side effects, especially in the elderly **(Basuny et al., 2020),** and focus on identifying changeable risk factors that can minimize the effect of the knee OA **(Ganji et al., 2018),**

Since knee OA is one of the chronic illnesses linked with a person's habits, behaviors, and lifestyle, nurses can actively provide information and recommendations to patients with knee OA and their families related to OA knee management, work with patients to develop personalized care plans **(Cui et al., 2020),** that incorporate instructional guidelines and interventions to help manage knee OA and improve overall health outcomes and life satisfaction **(Jormand et al., 2022).**

International guidelines recommend patient education, and weight reduction, where overweight is one of the main modifiable risk factors for knee OA to avoid load over the knee joints **(El Miedany & Elwakil, 2023).** Regular therapeutic exercise is the first line for management and protection of knee joint OA, low-impact aerobic exercise, lower limb and quadriceps strengthening exercise, swimming, improving the range of motion, correctly use of walking aid supplies, and medication as the prescribed regimen **(Kamps et al., 2023).** The side effects of drugs, recommendations for facilitating daily activities and living as independently maintaining elderly independence as possible **(Cunningham et al., 2021).**

Significance of the Study:

The World Health Organization (WHO) estimates that over 343 million people worldwide suffer from OA. **(Mohsen et al., 2021),** as well as it has significant social and financial effects with an approximated billions of dollars as an annual cost in medical care.

In Egypt, Knee OA is a common health problem and prevalent condition that affects 5,596,869 of the total population **(Ahmed et al., 2022).**

A guideline is informational, not mandatory and gives recommendations, instructions, interpretations, best practice guidance, or frameworks in which to operate. Guidelines may change frequently depending on the needs, and new evidence has the potential to improve the health outcomes and quality of life of elderly people with knee OA **(Cui et al., 2020).** This type of program can provide elderly patients with the knowledge and skills needed to manage their condition better, by improving patients' self-care abilities, and lifestyle modifications, leading to improved health outcomes and patient satisfaction **(Soliman et al., 2016).**

Aim of the Study:

The current study aimed to evaluate the effect of instructional guidelines on selected health outcomes among the elderly with knee osteoarthritis.

Research Hypothesis:

Applying instructional guidelines will positively affect selected health outcomes of elderly with knee osteoarthritis.

Operational definitions:

Instructional guidelines for knee osteoarthritis:

Provides health information to the elderly related to knee osteoarthritis, including definition, causes, signs and symptoms, risk factors, complications, medication, therapeutic exercises, stretching, strengthening exercises for

lower limb, range of motion exercises, balance exercises, healthy diet and weight reduction, lifestyle modifications, follow-up, and management of knee osteoarthritis (**Voinier & White, 2022).**

Elderly outcomes are operationally defined as the improvement of elderly patient's outcomes according to Knee Injury and Osteoarthritis Outcome Score (KOOS) **(Roos et al., 1998)** including symptoms such as pain, stiffness of the knee joints, daily living activities performance, and knee-related quality of life of elderly patients with symptomatic knee osteoarthritis as evidenced by the comparison of these items pre/post-implementation of the designed nursing intervention guidelines.

Subjects and Methods:
I. Technical Design:
Research design:
A quasi-experimental design with one group pre, post-guidelines) was utilized in this study.

Settings:
This study was conducted at the rehabilitation and rheumatology units of three hospitals (Souad Kafafi University Hospital, Al Sheekh Zayeed Hospital, and Central 6th October Hospital, as the administrators of these places were very cooperative and availability of cases because of the health insurance patients were included in this hospitals.

Subjects and sample size:
A purposive sample of elderly patients of both sexes was recruited according to the following criteria:

Inclusion criteria:
Patients aged 60 years and older, diagnosed with mild or moderate knee osteoarthritis, from not more than two years, in their last rehabilitation session and agreed to participate in the study at the pre-listed settings using pre and post-test.

Exclusion criteria:
Elderly had joint replacement surgery or arthroscopic surgery, deformity of lower limbs, receiving analgesics or pain killers, medical history of previous or current joint surgeries or injuries, BMI more than 34.9, received previous program or elderly patients with speech problems.

Sample size:
The sample size was 80 elderly patients, calculated according to the **Thompson (2012)** equation, at a confidence level of 95%.

$$n = \frac{P(1-P)}{\frac{(e)^2}{(Z)^2} + P(1-P)}$$

(n) Sample volume, (Z) The standard value, which is statistically 1.96 at a significant level (0.05), (p) Percentage of availability of the main phenomenon under study which is equal to 50%, (1- p) The percentage of non-availability of the main phenomenon under study 50%, (e) Sampling error which is equal to (0.05).

The result is 80 elderly patients, and the total sample was distributed among the three rehabilitation units in the studied hospitals as follows:

Hospitals' name	Sample number	%
Souad Kafafi University Hospital	15	18.75
Al Sheekh Zayeed Hospital	25	31.25
Central 6th October Hospital	40	50
Total sample size	80	100

Tools of Data Collection: Two tools were used to collect data:

Tool I: Self-administered questionnaire included two parts:

Part A: Elderly Patient's Socio-Demographic Characteristics: Developed by the researchers to assess elderly patients' socio-demographic characteristics; it included six multiple-choice closed-ended items about personal characteristics such as age, gender, marital status, education, previous occupation, and income.

Part B: Elderly Patient's Medical History:

It was developed by the researchers, for assessment of the health history and present health status of the studied elderly patients. It included five items, about the patient's height and weight, to calculate the elderly body mass index, where: Normal (18.5-24.9)- Overweight (25-29.9) and Obese (30-34.9) (**National Heart, Lung and Blood Institute, 2022**). Chronic disease, duration of knee osteoarthritis, the affected knee, healthy and non-healthy habits such as smoking, and practice exercises.

Tool II: The Knee Injury and Osteoarthritis Outcome Score (KOOS) questionnaire: Adapted from (**Roos et al., 1998**) and translated to Arabic by **Ateef (2020),** to evaluate short and long-term selected outcomes. The KOOS is self-administered and grouped under five outcomes:

1- Pain: Nine questions are used to assess the degree of knee pain when performing certain activities, such as; walking on a flat surface, stairs climbing, and sitting or sleeping upright in bed at night.

2- Symptoms: Seven questions, to assess the level of knee symptoms, such as swelling, grinding, hanging up, straightening, and full flexion, as well as the amount of joint stiffness after waking up in the morning.

3- Activities of daily living: Seventeen questions, for assessment of the level of difficulty associated with selected activities such as descending and ascending stairs, getting up from sitting, standing, bending down to the floor to picking up an object, walking on a flat surface, getting in and out of car, going shopping, putting on socks, lying from bed, taking off socks, lying in bed (turning over, maintaining knee position), getting in and out of bath, sitting, getting on/off toilet, household chores.

4- Sport and recreation function: Five questions, for assessment of the level of difficulty during different activities such as squatting, running, jumping, turning/twisting on the injured knee, and kneeling.

5- Knee-related Quality of life: four questions, to assess elderly patients' level of difficulty in performing daily living activities related to knee osteoarthritis (**Roos et al., 1998**).

The Scoring System:

The KOOS's five patient-relevant dimensions are scored separately, every item has five alternative answer options, in the form of a Likert Scale, and is rated from 0 (No problems) to 4 (Extreme problems), and each of the five scores is calculated by adding up all of the item percentages and dividing the result by the total number of items, giving a mean percentage for the domains (**Roos et al., 1998**).

II- Operational Design:

Preparatory phase:

It entailed reviewing related literature and developing theoretical knowledge of different aspects of the related topics through books, articles, websites, and journals related to the chosen topic to develop data collection tools.

Content validity and reliability:

Validity was done for Tool I by a jury of five gerontology nursing professionals to determine validity by evaluating the tool's comprehensibility, relevance, clarity, rationality, and applicability of the tool. After making the necessary minor adjustments, back-to-back translations were used to translate the text into basic Arabic.

Reliability for the tools was tested statistically after translation using Cronbach's Alpha to be represented at 0.813 to ensure that it was reliable before data collection. Tool II was already valid, and it was used in its Arabic language version.

Ethical considerations:

The study was approved by the scientific ethical research committee at the faculty of nursing, at Port Said University. The study was approved by the scientific ethical research committee at the faculty of nursing, Port Said University, code number, NUR (3/9/2023) (29). The aim of the study was explained to each

participant in the study to get permission to participate, and to be familiar with the importance of his participation. Accordingly, written consent was obtained from each elderly person, who was informed about the purposes, benefits and, nature of the study. The researchers assured the elderly patients that their participation in this study was voluntary and that they also had the right to withdraw from the study at any stage without giving any reasons and without any harmful effect on them as any information they provided would remain strictly confidential and exclusively used for research purposes only.

Pilot study:

The pilot study was conducted on 10% of the total number of elderly patients, which equaled (8) patients, The purpose of the pilot study was to ascertain the validity of the developed instruments used for data collection, as well as the clarity, objectivity, relevance, and applicability of these tools, and to estimate the time required for completion of the data. The elderly patients who participated in the pilot trial were included in the main study sample, and the results of the statistical analysis of the pilot study were used to make some minor modifications.

Fieldwork:
The fieldwork was performed through four phases:

A. Assessment Phase:

The researchers were present at the previously mentioned settings four days a week, and the data were collected over three months from the beginning of April 2023 to the end of June 2023, the average number of elderly interviewed was 4-5 patients/day.

After getting the approval to proceed with the study, the researchers reviewed the medical records to select the targeted patients who fit the inclusion criteria and scheduled them for a meeting in the same day of their scheduled rehabilitation sessions, in their last session.

B. Planning phase:

Based on the results obtained from the interview sheet from the pilot study and

assessment phase (pre-test) as well as reviewing the related literature, the researchers developed the educational guidelines after detecting the elderly patient's needs, requirements, The aim, and objectives of the educational guidelines were developed based on identified needs, requirements, and weaknesses.

Construction of the Guidelines:

The guidelines were constructed in simple Arabic language, using clear and concise words, written objectively, written in a positive tone, which improves readability and avoids phrasal verbs, and used the present simple tense as it is easier to read than the past or future tense. Humor, jargon, exclamation marks, idioms, metaphors, and other colloquialisms were avoided. As well personification, such as "probably", "hopefully", and "basically" are avoided abbreviations and medical terminology. Sentences are short and simple as they are easier to read and understand. Ambiguous titles were also avoided, where each title included a clear description of the page's subject.

Content of the guidelines
The general objectives of instructional guidelines:

- Improve the elderly patient's selected health outcomes, including symptoms, pain, discomfort, stiffness, daily living activities, and knee-related quality of life in elderly individuals with symptomatic osteoarthritis.

The specific objectives: after guidelines delivery, the studied elderly and their caregivers should be able to:

-Identify knee osteoarthritis.

- Identify causes of knee osteoarthritis.
- Explain complications of knee osteoarthritis.
- Explain tips to slow the degeneration of the knee.
- Discuss ways for reduction of knee pain.
- Identify ways for improvement of functional status.
- Applied gait training exercises and at least one exercise for leg muscle strengthening and stretching.

The content was revised by three experts in the nursing field and modified by the researchers according to the related literature.

A) First chapter:

It includes an introduction to the guidelines, the general and main objectives of the guidelines, simplified anatomy of the knee joints structure, and a well-detailed explanation of knee osteoarthritis, symptoms, risk factors, and complications.

B) Second chapter:

Medical management, nursing care, and prevention of KOA through:

➢ **Lifestyle modifications:** For patients who complain of knee osteoarthritis.

• **Health education**: It can involve information for enhancing elderly patients' knowledge and developing self-management (goal setting, problem-solving, positive thinking). Information about prescribed medication and its side effects, joint protection measures, goals of the therapeutic exercise for the elderly patient with knee OA and its approaches.

• **Educating about a healthy diet for joint protection and management of overweight** (as risk factors for cardiovascular disease, and OA of the knee): Use fresh fruits and vegetables, reach in vitamins C and D, calcium, omega 3, soya, olive oil, drink enough water, green tea, etc. healthy and proper diet for osteoarthritis patients to control body weight and providing the required nutritional elements i.e., proper nutrition (**Mohsen et al., 2021**).

• **Ways to reduce pain:** Encourage people to make the behavioral adjustments required to better their condition, psychological support may include strategies to manage pain, cope with stress, and improve mood such as; relaxation techniques, recommendations for pain control as how to use hot water applications to reduce pain, and knee resting (**Gad Allah et al., 2019**).

• **Proper use of a cane**: Different types of canes and proper use of it.

➢ **Home environment modifications,** modifying surrounding environment, such as; sitting on a chair, using

toilet aids, and information about daily care for KOA, etc. (**Basuny et al., 2020**).

➢ **Physical activities:** Explanation of the benefits of therapeutic exercise for elderly patients with knee osteoarthritis, for improving knee joints and helping improve physical function and reduce pain (**Gad Allah et al., 2019**).

➢ Exercise programs may include activities such as:

➢ **Strength exercises** for the training of hamstrings and quadriceps muscles included the most recommendable exercises for stretching and strengthening of knee muscles.

- **Range of motion.**

- **Balance and gait exercises,** training exercises for balance, and prevention of falling where exercise (**Voinier & White, 2022**).

- **Aerobic exercise**, the American College of Sports Medicine (ACSM) recommends that adults, including those aged ≥65 years and those with chronic conditions like knee OA, are advised to engage in moderate-intensity aerobic exercise for at least 20 to 30 minutes per day (split into 10-minute sessions) on at least five days per week for a total of 150 minutes per week, or vigorous aerobic exercise for 20 minutes on at least three days per week for a total of 75 minutes per week. But a lot of people don't meet these (**Jormand et al., 2022**). According to these recommendations, for elderly with knee pain, activity levels can be even lower than in normal persons, with a cousin of any increase in symptoms, including pain or swelling, interpreted as having overused it, with completed exercise within the limits of their pain (**Voinier & White, 2022**), and terminates the activity if it was painful or resulted in a significant increase in symptoms, and modify activity patterns and changing the type of exercise completely, e.g. changing from cycling to walking (**Holden et al., 2015**).

- **Proper ways to sit and walk**, balance, and gait training.

C. **Implementation Phase:**

At this phase, the first interview was done for the pre-guidelines assessment using tool I and tool II. The researchers interviewed patients at the waiting area of the rehabilitation and rheumatology unit, who were previously scheduled and introduced themselves to the patients and explained the target of the study

and asked them to participate in the study. The written consent was taken to participate in this study two times (pre- and post-guidelines), and for telephone calls and WhatsApp follow-up. After giving the guidelines to the patients, the contents of the guidelines were delivered in one session, divided into two parts (theoretical part and practical part) with a duration of about 40-60 min. Sessions were identical for all elderly patients. The instructional guidelines were implemented in about three months.

> **Teaching methods**

The researchers used a variety of teaching methods, such as; brainstorming, demonstration, and re-demonstration for exercises and balance and gait training.

> **The teaching aids:** The researchers designed and developed:
• *An instructional guidelines video film:* It included all items of the guidelines content, acted by the researchers themself, and the created educational video film was sent to the elderly patients via WhatsApp or other electronic methods.
• *An instructional guidelines booklet:* In simple Arabic, an illustrated coloured paper booklet was given to each participant entitled "Guide for KOA elderly" as guidance at home, to ensure that the patients understand the information included in the guidelines, to be sure that the patient can apply it in their homes.
> **Teaching time:** It was flexible and decided according to the patient's schedule for rehabilitation sessions; the instructional guidelines were delivered individually for participants.
> **Teaching place:** In the waiting area of the rehabilitation and rheumatology unit.
D. Evaluation Phase:

After completion of implementation of the instructional guideline's contents, the elderly patients were contacted by phone calls or via WhatsApp for follow-up, every two weeks after delivery of the instructional guidelines, to ensure patients application. Three months later, post the instructional guidelines, an assessment was done by a Google form or by phone for patients with difficulty to use smartphones or do

not have it, and use Google link for post-test evaluation, for the patients who did not have counseling visit to the hospital in this time, by using tool II to determine changes between pre- and post-delivery of the instructional guidelines. The researchers analysed the data collected from elderly patients and compared pre- and post-delivery results to assess the effectiveness of the instructional guidelines.

Statistical analysis:

Recorded data were analyzed using the Statistical Package for Social Sciences (SPSS), version 26 (SPSS Inc., Chicago, Illinois, USA). The frequencies and percentages were used to express the descriptive data. The standard deviation and mean were used to express qualitative data. To compare the variables, the parametric Chi-square ($\chi2$) test was used. The paired-sample t-test was used to compare quantitative variables. The following criteria were used to determine the level of significance at (p-value) was considered as the following: P-value ≤0.05 was considered significant, P-value ≤0.001 was considered as highly significant, P-value >0.05 was considered insignificant.

Results

Table (1) shows that; 60.2 % of the elderly patients under study were males, 43.7% of them were between 60 to ≤ < 70 years with a mean age of 68 ± 1.367, regarding education, 33.8% of them had a secondary school or a technical diploma 71.3 were married, and 71.3% are retired.

Table (2), reveals that; 42.5% of the elderly patients under study were overweight as their body mass index was between 25and 29.9, 25% of them were obese as their body mass index was between 30 and34.9. Concerning chronic diseases, 27.5% had diabetes mellitus as a chronic disease. Regarding duration of the knee osteoarthritis, for 52.5 % of the studied elderly patients, the duration of disease was less than 6 months and 62.5% of them were affected by osteoarthritis in both of their knees. As for smoking habit, 56.3 % of the elderly patients were smokers and 75% were not practicing any kind of sports or physical exercises.

Figure (1) clarifies that; 6.3% of the elderly patients reported absence of knee pain pre-guidelines implementation, which increased to 13.7% post-guidelines, 18.7% of the elderly patients reported continuously feeling knee pain (always) pre-guidelines which decreased to 16.3% post-guidelines. Meanwhile, there is a decrease in the frequency of pain feeling in the form of an increase in the patient's monthly feeling of knee pain (20%) pre-guidelines implementation to (25%) post-guidelines respectively with a statistically significant difference (X^2 =10.36 at P= 0.031).

Table (3): Illustrates a decrease in the percentage of elderly patients who reported severe and extreme knees pain during different movements such as (twisting/pivoting, while in bed, sitting or lying, and standing upright), (25%, 25%, 31.25%, 22.5%, 27.5% and 27.5%) and (28.7%, 26.25%, 35%, 27.5%, and 28.75%, respectively), pre-implementation of the guidelines, in comparison to (18.75%, 17.5%, 27.5%, 18.75%, 23.75%, and 18.75%) and (18.75%, 12.5%, 18.75%, 31.25%, 20%, 25% and 21.25%) post-implementation of the guidelines. Meanwhile, there is an increase in the percentage number of elderly patients who reported no pain feeling or feeling of mild knees pain during the same movements, pre-implementation of the guidelines, in comparison to post-implementation of the guideline, with a statistically significant difference at p ≤ 0.05.

Table (4) presents that; 31.25% of the studied patients experienced severe knee stiffness after first awakening in the morning, and severe knee stiffness after sitting, lying, or resting later in the day pre-implementation of the guidelines, however, this severity in knee stiffness improved and decreased to be 25%, and 21.25% respectively post-implementation of the guidelines. In addition, 27.5% of the patients always complaint of swelling in their knee, 25% always feel grinding, hearing clicking or any other type of noise when their knee moves, 30% of the patients their knees sometimes catch or hang up when moving, these percentage number decrease as a form of improvement to be (17.5%, 17.5%, and 25%), respectively with highly statistically significant differences at P value < 05.

Table (5.1): Reflects that; 23.75%, 26.25%, 25%, 25%, 28.75%, and 23.75% of the studied patients reported severe difficulty in descending stairs, ascending stairs, and severe difficulty rising from sitting, or standing, getting in/out of the car and going shopping respectively pre-implementation of the guidelines improved to (20%, 23.75%, 22.5%, 18.75%, 23.75%, and 20%) respectively post-implementation of the guidelines with statistically significant differences at P value <0.05.

Table (5.2): Reveals that, 37.5%, 25%, and 18.75 % of the studied patients complained of extreme difficulty in putting on and off socks/stockings and extreme difficulty in sitting pre-implementation of the guidelines, respectively, which improved to 25% 12.5% and 15%post-implementation of the guidelines, with highly statistically significant differences at P value <0.05.as there is an improvement in the mean of the total score of reported performing activity of daily living 3.452, SD = ± 1.367, pre-implementation compared to post-implementation of the guidelines mean= 4.32 SD= ±1.11 with high statistically significant differences at P- value < 05. (x^2 = 19.21 P-value= 0.042).

Table (6): Concerning the degree of difficulty in practicing sports and recreational activities, the current study findings demonstrates that there were improvements as an increase in the percentage of patients who reported no difficulty in squatting, running, twisting on knees 13.7%, 17.5%, 17.5 pre-implementation of the guidelines increased to 15%, 18.75, and 18.75 post-implementation of the guidelines, with decrease in percentage of patients who reported extreme difficulties in kneeling from 10% pre- to 6.25% post-implementation of the guidelines with no statistically significant differences between pre and post-implementation of the guideline, as there is an improvement in the mean of the total score pre-implementation of the guidelines mean =3.952SD ± 1.367 compared to post-implementation of the guidelines mean = 4.84SD ± 0.654with statistically significant differences X^2 =0.011 P-10.32

As regards patient's quality of life **table (7)** indicates that 50 % of the patients under the study reported modifying their lifestyle to avoid potentially damaging activities to the knees post-implementation of the guidelines compared to 33.7% pre-implementation of the guidelines, studied patients reported severity of difficulty with knee decreased from 25% pre- to 30 post-implementation of the guidelines, with a statistically significant statistical difference of the mean of the total score Mean = 4.12 SD ± 0.985, compared to post-implementation of the guidelines mean = 4.256 SD ± 1.423

with statistically significant differences $X^2 = 19.21$ at P=0.040.

Table (8) also shows that; the mean of all the five studied dimensions is greater than (3), and this indicates improvement with statistical significance, as the differences between the averages before and after implementation of the guidelines indicate continuous and observed improvement. The table shows the values of the standard deviations before and after the intervention, which means reducing dispersion rates.

Table 1: Distribution of the Studied Knee Osteoarthritis Elderly Patients According to their Demographic Data (n=80).

Socio demographic data		No	%
Gender			
Female		32	38.8
Male		48	60.2
Age (years)			
60- <70		35	43.7
70- <80		25	31.3
≥80		20	25.0
Mean ± SD	68 ± 1.367		
Level of education			
Bachelor's		26	
Secondary school/Technical		27	
Read and write		18	22.5
Uneducated		9	
Marital status			
Married		57	71.3
widowed		22	27.5
divorced		1	1.3
Previous occupation			
Works		23	28.8
Retired		57	71.3
Income			
From a fixed source		50	62.5
from an unstable source		30	37.5

Table 2: Distribution of the Studied Elderly Patients with Knee Osteoarthritis According to their Health Status (n=80).

Health status data	No.	%
Body Mass Index:		
Normal (18.5-24.9)	26	32.5
Overweight (25-29.9)	34	42.5
Obese (30-34.9)	20	25.0
Chronic diseases		
Diabetes	22	27.5
Hypertension	15	18.75
Heart disease	11	13.75
Liver disease	1	1.25
Rheumatic diseases	10	12.5
Kidney disease	5	6.25
Duration of knee osteoarthritis		
Less than 6 months	42	52.5
6 months to less than one year	22	27.5
1 year toless than two years.	16	20.0
Affected knee		
Left knee	20	25
Right knee	10	12.5
Both	50	62.5
Smoking habit		
Smoker	45	56.3
Non smoker	35	43.7
Practice sports or physical exercises		
Yes	20	25
No	60	75

*Numbers are not mutually exclusive

Figure (1): Distribution of the Studied Patients According to their Reported Pain Frequency Pre and Post Implementation of the Guidelines (no=80).
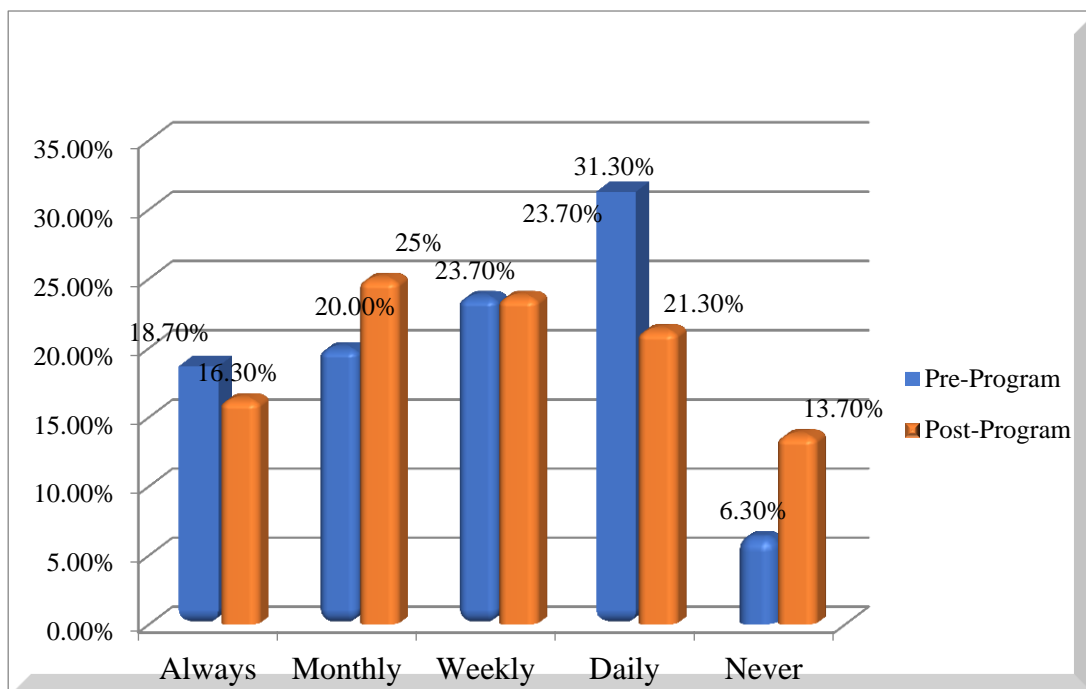
Table (3): Distribution of the Studied Patients According to their Reported Pain During Different Movements **(no=80).**

No.	Degree of Pain Experienced During the Last Week When:	Pre (n=80)		Post (n=80)		Chi-square test	
		No.	%	No.	%	X^2	p-value
1.	**Twisting/pivoting on knees**						
	None	6	7.5%	9	11.25%		
	Mild	13	16.25%	17	21.25%		
	Moderate	18	22.5%	24	30%		
	Severe	20	25%	15	18.75%		
	Extreme	23	28.7%	15	18.75%	**15.23**	**0.047***
2.	**Full knee straightening.**						
	None	7	8.75%	12	15%		
	Mild	15	18.75%	23	28.75%		
	Moderate	19	23.75%	20	25%		
	Severe	18	22.5%	15	18.75%		
	Extreme	21	26.25%	10	12.5%	**11.23**	**0.01**
3.	**Full knees bending**						
	None	6	7.5%	9	11.25%		
	Mild	10	12.5%	11	13.75%		
	Moderate	18	22.5%	18	22.5%		
	Severe	22	27.5%	20	25%		
	Extreme	24	30%	22	27.5%	**25.2**	**0.04**
4	**Walking on a flat surface**						
	None	5	6.25%	10	12.5%		
	Mild	14	17.5%	19	23.75%		
	Moderate	18	22.5%	22	27.5%		
	Severe	20	25%	14	17.5%		
	Extreme	23	28.75%	15	18.75%	**11.06**	**0.02**
5	**Going up or down stairs**						
	None	5	6.25%	7	8.75%		
	Mild	8	10%	10	12.5%		
	Moderate	14	17.5%	16	20%		
	Severe	25	31.25%	22	27.5%		
	Extreme	28	35%	25	31.25%	**10.63**	**0.015**
6	**At night while in bed**						
	None	9	11.25%	14	17.5%		
	Mild	15	18.75%	16	20%		
	Moderate	16	20%	19	23.75%		
	Severe	18	22.5%	15	18.75%		
	Extreme	22	27.5%	16	20%	**11.56**	**0.042***
7	**Sitting or lying**						
	None	5	6.25%	11	13.75%		
	Mild	11	13.75%	14	17.5%		
	Moderate	19	23.75%	16	20%		
	Severe	22	27.5%	19	23.75%		
	Extreme	23	28.75%	20	25%	**19.3**	**0.01***
8	**Standing upright**						
	Non	8	10%	10	12.5%		
	Mild	10	12.5%	18	22.5%		
	Moderate	17	21.25%	20	25%		
	Severe	22	27.5%	15	18.75%		
	Extreme	23	28.75%	17	21.25%	**12.36**	**0.041***

X2 (chi-square test); P value is significant at <.05

Table (4): Distribution of the Studied Patients According to their Reported Symptoms Pre-Post implementation of the Guidelines (n=80):

No.	Symptoms	Pre (n=80)		Post (n=80)		Chi-square test	
		No.	%	No.	%	χ^2	p-value
1	**The severity of knee stiffness in the morning**						
	None	6	7.5%	8	10%		
	Mild	10	12.5%	13	16.25%		
	Moderate	17	21.25%	19	23.75%		
	Severe	25	31.25%	20	25%		
	Extreme	22	27.5%	20	25%	11.36	0.003
2	**Severity of knee stiffness after sitting, lying, or resting later in the day?**						
	None	8	10%	10	12.5%		
	Mild	10	12.5%	19	23.75%		
	Moderate	17	21.25%	18	22.5%		
	Severe	25	31.25%	17	21.25%		
	Extreme	20	25%	16	20%	15.32	0.011*
3	**Severity of knee swelling**						
	Never	5	6.25%	9	11.25%		
	Rarely	14	17.5%	15	18.75%		
	Sometimes	18	22.5%	23	28.75%		
	Often	21	26.25%	19	23.75%		
	Always	22	27.5%	14	17.5%	10.36	0.032*
4	**Grinding, hearing clicking, or any other type of noise during movement**						
	Never	6	7.50%	10	12.5%		
	Rarely	16	20%	25	31.25%		
	Sometimes	19	23.75%	17	21.25%		
	Often	19	23.75%	14	17.5%		
	Always	20	25.0%	14	17.5%	19.32	0.050*
5	**Catch or hang up when moving?**						
	Never	5	6.25 %	11	13.8 %		
	Rarely	18	22.5 %	25	31.2 %		
	Sometimes	24	30%	20	25%		
	Often	14	17.5 %	10	12.5%		
	Always	19	23.75%	14	17.5%	18.31	0.040*
6	**Ability to perform full knee straighten**						
	Never	5	6.25%	3	3.75%		
	Rarely	7	8.75%	4	5.00%		
	Sometimes	18	22.5%	20	25.0%		
	Often	22	27.5%	25	31.25%		
	Always	25	31.25%	28	35%	4.32	0.230
7	**Ability to perform full knee bending:**						
	Never	20	25%	18	22.5%		
	Rarely	21	26.2%	19	23.75%		
	Sometimes	20	25%	20	25%		
	Often	13	16.25%	15	18.75%		
	Always	6	7.5%	8	10%	5.163	0.271

X2 (chi-square test); P value is significant at <.05

Table (5.1): Distribution of the Studied Patients According to their Degree of Difficulty of Daily Living Activity Function Pre and Post Implementation of the Guidelines **(n=80).**

Activities of daily living		Pre (n=80)		Post (n=80)		Chi-square test	
		No.	%	No.	%	χ^2	p-value
1	**Difficulty in : descending stairs**						
	None	10	12.5%	14	17.5%		
	Mild	12	15%	15	18.75%		
	Moderate	20	25%	18	22.5%		
	Severe	19	23.75%	16	20%		
	Extreme	19	23.75%	17	21.25%	12.34	**0.024***
2	**Ascending stairs**						
	None	5	6.25%	6	7.50%		
	Mild	15	18.75%	16	20.0%		
	Moderate	19	23.75%	20	25.0%		
	Severe	21	26.25%	19	23.75%		
	Extreme	20	25.00%	19	23.75%	4.092	**0.394**
3	**Rising from sitting**						
	None	5	6.25%	7	8.75%		
	Mild	15	18.75%	22	27.5%		
	Moderate	25	31.25%	16	20%		
	Severe	20	25%	18	22.5%		
	Extreme	15	18.75%	17	21.25%	15.20	**0.034***
4	**Standing**						
	None	5	6.25%	10	12.5%		
	Mild	25	31.25%	27	33.75%		
	Moderate	15	18.75%	18	22.5%		
	Severe	20	25%	15	18.75%		
	Extreme	15	18.75%	10	12.5%	15.32	**0.01***
5	**Bending to floor/picking up an object**						
	None	3	3.75%	9	11.25%		
	Mild	11	13.75%	25	31.25%		
	Moderate	23	28.75%	16	20%		
	Severe	20	25%	15	18.75%		
	Extreme	23	28.75%	15	18.75%	1.32	**0.525**
6	**Walking on a flat surface**						
	None	12	15%	15	18.75%		
	Mild	16	20%	18	22.5%		
	Moderate	19	23.75%	17	21.25%		
	Severe	17	21.25%	16	20%		
	Extreme	16	20%	14	17.5%	8.32	**0.81**
7	**Getting in/out of the car**						
	None	10	12.5%	16	20%		
	Mild	11	13.75%	12	15%		
	Moderate	18	22.5%	16	20%		
	Severe	22	27.5%	19	23.75%		
	Extreme	19	23.75%	17	21.25%	16.32	**0.038***
8	**Going shopping**						
	None	5	6.25%	7	8.75%		
	Mild	13	16.25%	19	23.75%		
	Moderate	20	25%	25	31.25%		
	Severe	23	28.75%	16	20%		
	Extreme	19	23.75%	13	16.25%	20.11	**0.001***

Table (5.2): Distribution of the Studied Patients According to their Degree of Difficulty of Daily Living Activity Function Pre-Post Implementation of the Guidelines **(n=80).**

Activities of Daily Living		Pre (n=80)		Post (n=80)		Chi-square test	
		No.	%	No.	%	X^2	p-value
9	**Putting on socks/stockings**						
	None	5	6.25%	7	8.75%		
	Mild	13	16.25%	15	18.75%		
	Moderate	12	15%	16	20%		
	Severe	20	25%	22	27.5%		
	Extreme	30	37.5%	20	25%	4.092	**0.394**
10	**Taking off socks/stockings**						
	None	6	7.5%	14	17.5%		
	Mild	15	18.75%	25	31.25%		
	Moderate	19	23.75%	18	22.5%		
	Severe	20	25%	13	16.25%		
	Extreme	20	25%	10	12.5%	**11.30**	**0.012***
11	**Lying in bed**						
	None	10	12.5%	15	18.75%		
	Mild	15	18.75%	17	21.25%		
	Moderate	21	26.25%	17	21.25%		
	Severe	16	20%	15	18.75%		
	Extreme	18	22.5%	16	20%	**14.20**	**0.030***
12	**Rising from bed**						
	None	14	17.5%	17	21.25%		
	Mild	16	20%	17	21.25%		
	Moderate	19	23.75%	19	23.75%		
	Severe	18	22.5%	16	20%		
	Extreme	13	16.25	11	13.75%	**11.20**	**0.01***
13	**Getting in the bath**						
	None	9	11.25%	13	16.25%		
	Mild	16	20%	18	22.5%		
	Moderate	20	25%	17	21.25%		
	Severe	17	21.25%	16	20%		
	Extreme	18	22.5%	16	20%	**16.32**	**0.045***
14	**Getting off the toilet**						
	None	12	15%	14	17.5%		
	Mild	14	17.5%	19	23.75%		
	Moderate	20	25%	18	22.5%		
	Severe	18	22.5%	15	18.75%		
	Extreme	16	20%	14	17.5%	**16.32**	**0.01***
15	**Sitting**						
	None	11	13.75%	15	18.75%		
	Mild	14	17.5%	23	28.75%		
	Moderate	25	31.25%	18	22.5%		
	Severe	15	18.75%	12	15%		
	Extreme	15	18.75%	12	15%	**17.32**	**0.04***
16	**Light domestic duties**						
	None	3	3.75%	9	11.25%		
	Mild	15	18.75%	20	25%		
	Moderate	25	31.25%	16	20%		
	Severe	20	25%	19	23.75%		
	Extreme	17	21.25%	16	20%	**12.38**	**0.043***
17	**Heavy domestic duties**						
	None	14	17.5%	18	22.5%		
	Mild	16	20%	20	25%		
	Moderate	19	23.75%	18	22.5%		
	Severe	18	22.5%	13	16.25%		
	Extreme	13	16.25	11	13.75%	**25.31**	**0.01***

Table (6): Distribution of the Studied Patients According to their Difficulty in Sport and Recreation Function Pre-Post Implementation of the Guidelines **(n=80):**

Sports and recreation function	Pre (n=80)		Post (n=80)		Chi-square test	
	No.	%	No.	%	X^2	p-value
1 **Difficulty in:**						
Squatting	11	13.7	12	15		
None	14	17.5	12	15		
Mild	8	10	10	12.5		
Moderate	20	25	20	25		
Severe	27	33.7	26	32.5	1.32	0.131
Extreme						
2 **Running**						
None	14	17.5	15	18.75		
Mild	16	20	18	22.5		
Moderate	19	23.75	19	23.75		
Severe	18	22.5	16	20		
Extreme	13	16.25	12	15	5.41	0.141
3 **Jumping**						
None	12	15	12	15		
Mild	13	16.25	15	18.75		
Moderate	5	6.25	6	7.5		
Severe	20	25	17	21.25		
Extreme	30	37.5	30	37.5	4.32	0.132
4 **Turning/twisting on your knee**						
None	14	17.5	15	18.75		
Mild	16	20	18	22.5		
Moderate	19	23.75	17	21.25		
Severe	18	22.5	18	22.5		
Extreme	13	16.25	12	15	7.21	0.149
5 **Kneeling**						
None	20	25	20	25		
Mild	15	18.75	19	23.75		
Moderate	19	23.75	21	26.25		
Severe	18	22.5	15	18.75		
Extreme	8	10	5	6.25	4.63	0.225

X2 is chi-square test; P value is significant at <.05

Table (7): Distribution of Studied Patients According to their Knee-related Quality of Life Pre and Post Implementation of the Guidelines**(n=80)**

Knee-related quality of life		Pre (N=80)		Post (N=80)		Chi-square test	
		No.	%	No.	%	X^2	p-value
1	**How often are you aware of your knee problems?**						
	Never	14	17.5%	17	21.25%		
	Monthly	16	20%	18	22.5%		
	Weekly	19	23.7%	19	23.75%		
	Daily	18	22.5%	17	21.25%		
	Always	13	16.25	9	11.25%	**15.32**	**0.014**
2	**Have you modified your lifestyle to avoid potentially damaging activities to your knee?**						
	Not at all						
	Mildly	11	13.7%	5	6.25%		
	Moderately	14	17.5%	6	7.5%		
	Severely	8	10%	5	6.25%		
	Totally	20	25%	24	30%		
		27	33.7%	40	50%	**18.12**	**0.034***
3	**How troubled are you with a lack of confidence in your knee?**						
	Not at all						
	Mildly	14	17.5%	15	18.7%		
	Moderately	16	20%	18	22.5%		
	Severely	19	23.75%	19	23.75%		
	Totally	18	22.5%	14	17.5%		
		13	16.25	14	17.5%	**10.32**	**0.028***
4	**In general, how much difficulty do you have with your knee?**						
	Not at all						
	Mildly	3	3.8%	6	7.5%		
	Moderately	23	28.7%	31	38.75%		
	Severely	11	13.7%	15	18.7%		
	Totally	20	25%	16	20%		
		23	28.7%	12	15%	**14.32**	**0.01***

X^2 is chi-square test; P value is significant at <.05

Table (8): Total KOOS's Five Patient-Relevant Dimensions Score of Studied Patients Pre and Post-Implementation of the Guidelines **(n=80):**

KOOS's five patient-relevant dimensions	Pre (n=80)	Post (n=80)	X^2	p-value
Pain Mean ± SD	3.12 ± 0.256	4.32± 0.952	11.32	0.012*
Symptoms Mean ± SD	3.05± 0.952	3.951 ± 0.854	15.32	0.035*
Activates of daily Mean ± SD	3.452 ± 1.367	4.32 ± 1.11	19.21	0.042*
Sports and recreation function Mean ± SD	3.952 ±1.367	4.84 ±0.654	10.32	0.011*
Knee-related quality of life Mean ± SD	4.12 ± 0.985	4.256 ± 1.423	19.21	0.040*
The Total Mean ± SD	3.852± 1.367	5.361 ± 1.42	14.23	0.021*

P value is significant at <.05

Discussion:

In addition to being the second most prevalent diagnosis given to older adults, knee OA is the third fastest-growing disease and the most common cause of impairment at older ages. (**Voinier & White, 2022**). Although the severity of the clinical symptoms can vary, neglecting care usually causes them to worsen and occur more frequently (**Mohsen et al., 2021**). The most common complaints associated with knee OA are knee pain, joint stiffness, and weakness in the lower limb muscles. These symptoms limit mobility and cause functional limitations. psychosocial problems like anxiety, depression, and helplessness are also common. (**Alghadir et al., 2019**).

Nurses have critical role in helping knee OA patients to manage their condition. Guidelines for knee OA, education intervention has been acknowledged as one of the essential elements for effective management of knee OA. Educating patients about knee OA improves their chances of adopting healthy lifestyle choices and good behavioral changes that will lead to better health outcomes. Giving patients the tools to oversee their own care is the goal of these interventions (**Tan, et al., 2020**).

Regarding demographic characteristics, the findings of the present study demonstrated that; slightly more than three-fifths of the elderly patients were males, and more than two-fifth half were between 60 to< 70 years with a mean age of 68 ± 1.367, this may be because Every ten years of life, the prevalence of knee OA rose, rising from 33% in the 60–70 age group to 43.7% among those over 80 years of age. Regarding education, nearly one-third of the study sample had a secondary school or a technical diploma, and almost two-thirds were married and retired.

The current study results go to some extent with those of **Mohsen et al., (2021),** who conducted a quasi-experimental study at the outpatient clinic of an Egyptian university and educational hospital, including 100 elderly patients, aimed to evaluate how well the nursing intervention affected the knowledge and practices of elderly patients with knees osteoarthritis, they found that; 74% of the studied elderly with knee osteoarthritis aged between 60 to 70 years with a mean age of 66.2±.6.4, 22% had secondary school or a technical diploma, and 72% of the patients were married.

Regarding the selected health status of the study patients, nearly two-fifths of the elderly patients under study were overweight as their body mass index (BMI) was between (25-29.9) and one-quarter of them were obese as their body mass index was between (30-34.9). This could be because being obesity and overweight are risk factors for the development and occurrence of osteoarthritis in the knee, and they may also contribute to the knee's deterioration.

Concerning chronic diseases, one-quarter had diabetes mellitus, more than half of the studied elderly patients' duration of knee osteoarthritis was less than 6 months, more two-thirds of them, were affected by osteoarthritis in both of their knees, these results are the same line with those of **Salis et al., (2023),** in a recent study, who found that the rise in BMI was linked, on its own, to a higher incidence and development of osteoarthritis in the knee. In terms of smoking behavior, almost 50% of the elderly patients in the study were smokers. This is explained by the association between smoking, chronic diseases, and inflammation in the different body tissues. Additionally, three-quarters were not practicing any kind of sports or physical exercises. These results were comparable to that of **Kamps et al., (2023),** in a recent retrospective cohort study in Holland, using data from the Integrated Primary Care Information database they found that knee osteoarthritis is more prevalent in patients with chronic diseases.

Concerning knee pain frequency, illustrates that; in pre-implementation of the guidelines, slightly less than one-fifth of the patients reported always feeling knee pain, this feeling improved and decreased to less than one-fifth post-implementation of the guidelines. Meanwhile, there was a delay in the feeling of knee pain in the form of an increase in the percentage number of patients who monthly and weekly feel knee pain pre-guidelines to post-guidelines rather than continuous feeling of pain

with a statistically significant difference $X^2 =$ 10.36 at P- 0.031. Those results are in the same line with those of **Skou et al. (2018),** in a study on 12,796 patients with knee osteoarthritis in Denmark, aimed to study the impact of a program that included physical activity and patients' education, revealed that knee pain intensity improved and decreased by 13.7 points (P < 0.05) post-intervention. This may refer to the fact that the program has a positive impact on controlling pain among their study patients.

Regarding pain intensity during movement, getting out of bed**,** and standing, there is an improvement in the mean of the total score of reported pain intensity 3.12±0.256, pre-implementation compared to post-implementation of the guidelines, 4.32±0.952 with highly statistically significant differences at P- value < 05. As a decrease in the percentage of elderly patients who reported severe and extreme knee pain during different movements such as, (twisting/pivoting, full knee straightening, walking on a flat surface, experiencing pain in their knees at night while in bed, sitting or lying, and standing upright, pre-implementation of the guidelines, compared to post-implementation of the guidelines. Meanwhile, there is an increase in the percentage number of elderly patients who reported no pain feeling or feeling of mild knees pain during the same movements, pre-implementation of the guidelines, in comparison to post-implementation of the guidelines, with a statistically significant difference at p ≤ 0.05 for most items.

The results of the current study were supported by those of **Hatefi et al. (2019),** in Iran in a study of 80 male patients aged at 65 years and more, to examined how a self-management program affected pain and disability index in older men with knee OA. They noted that after the program implementation, the pain and disability scores in the experimental group decreased (P < 0.05) and the mean (SD) pain score was 9.19 (0.71) in the self-management group, which reduced to 6.48 (0.84) after the intervention (P = 0.000).

Concerning patients' reported symptoms, nearly one-third of the studied patients experienced severe knee stiffness after first awakening in the morning and after sitting, lying, or resting later in the day pre-implementation of the guidelines, however, this severity in knee stiffness improved and decreased to one-quarter and near two fifths respectively post-implementation of the guidelines, as there is an improvement in the total score mean of reported symptoms 3.05±0.952, pre-implementation compared to post-implementation of the guidelines with mean= 3.951± 0.854 with highly statistically significant differences at P-value < 05. ($x2 =$ 15.32 P-value 0.035)**.** The results of the current study well-matched with those of **Chen et al.(2019**)**,** in a quasi-experimental study of 171 Chinese elderly patients to evaluate the impact of a home-based exercise program on elderly patients with knee osteoarthritis, the researchers reported that there was a statistically significant difference in knee pain intensity between the two groups before and after the program and that the intervention group also showed improvements in their overall symptoms score (parameter estimate, 1.30 [CI, 0.54 to 2.050], than the control group did after three months of the intervention, with a statistically significant differences between pre-post groups. However, the current study finding is inconsistent with that of **Cuperus et al. (2015),** in a randomized trial of the effectiveness of a non-pharmacological multidisciplinary face-to-face program in patients with generalized osteoarthritis, they reported that there were relatively small improvements noted in the short and long term, with limited benefits of a self-management program for individuals with osteoarthritis. This could be attributed to the difference in the duration of their study and the current study.

Concerning the degree of difficulty in performing daily living activity functions among studied patients, this study results revealed that less than two-fifths, one-quarter, and about one-fifth of the studied patients complained of extreme difficulty respectively, in putting on and off socks/stockings and extreme difficulty in sitting pre-implementation of the guidelines, which improved to one quarter, slightly more than one-tenth and more than one-tenth respectively, post-implementation of the guidelines, with highly statistically significant differences at P value < 05. However, there

were no statistically significant differences between pre-and post-implementation of the guidelines regarding ascending stairs, bending to the floor /picking up an object, and walking on a flat surface.

The ability to get out of a chair is an important activity of daily living, and being unable to perform this task may limit independence These results agreed with those of **Mohamed and Ali (2019)** who in a quasi-experimental study on 50 elderly patients investigated the impact of a nurse intervention protocol on the outcomes of patients suffering from knee, conducted at the orthopedic clinic of an educational hospital, in Egypt, they reported that there were marked improvements of the level of difficulty in performance daily living activity functions after the implementation of a nursing intervention protocol than pre-intervention for many items with statistically significant differences. This may be because the patients in the two studies are from the same demographic place.

Additionally, there were statistically significant differences between pre-and post-implementation of the guidelines about descending stairs, rising from sitting, shopping, putting on socks, sitting, using the toilet, and performing simple household chores. Regarding other items, including picking up a single object, there were no statistically significant variations between the pre-and post-test results. This may be brought on by the discomfort and incapacity associated with symptomatic osteoarthritis in the knee, which can make it harder to carry out daily tasks. These results are on the same line with those of **Ganji et al. (2018),** who discovered that the most effective method of promoting health, preventing disease, and successfully controlling, is through self-management education.

These findings are in contrast to those of **Khachian et al. (2020),** in a quasi-experimental study, aimed at investigating the effect of self-management health education on the outcome of knee osteoarthritis, using KOOS among 80 patients with knee osteoarthritis divided equally into a controlled and experimental group, they reported that; there was no significant difference in the total score of the outcome of knee osteoarthritis before the self-management training program between the experimental and control groups in the mean activities of daily living 49.15 ± 5.33 and 37.72 ± 6.82, t = 8.34. (P-value = 397). The difference might relate to differences in population characteristics that are known to affect physical activity patterns (such as sex, age, and body mass index).

Concerning the degree of difficulty in practicing sports and recreational activities, the current study findings demonstrate that there were improvements as an increase in the percentage of patients who reported no difficulty in squatting, running, twisting on knees pre-implementation of the guidelines compared to post-implementation of the guidelines, with a decrease in percentage number of patients who reported extreme difficulties in kneeling post-implementation of the guidelines with no statistically significant differences. However, statistically significant differences between the total score mean pre and post-implementation of the guidelines, 4.12±0.985, pre-implementation compared to post-implementation of the guidelines with mean 4.256 ±1.423,X^2=19.21 at P-0.040, at P- value < 05. This study result goes with **those of Mirzaee et al. (2016),** in a quasi-experimental study, on 88 patients with knee osteoarthritis to discover the impact of self-management training on the performance of elderly patients attending an orthopedic clinic, they found that there was a significant improvement in the mean performance total score of the studded elderly patients post-intervention. The current study results are also in the same line with those of **Patel et al.(2022),** who in a 12-week evidence-based program, to assess outcomes, on 15 American older adults with knee osteoarthritis with a median age of 70 years, noticed that the mean KOOS scores for knee function in daily function, and knee function in sport and recreation post-intervention improved with mean= 17.5±14.9) pre-program compared to mean= 25.0±20.0 post-program with statistically significantly differences P= 0.032. (P<0.05). This might occur from the knee joint experiencing higher supportable pressure during weight-bearing exercise, which results in knee pain.

Regarding knee-related quality of life, there were statistically significant differences

between pre- and post-implementation of the guidelines regarding lifestyle modification and difficulty with the knee among studied patients. This finding is inconsistent with those of **Jung Kao et al. (2011),** in a quasi-experimental study in China, on 250 Chinese elderly aged 67 ± 10 years with knee OA, aimed to evaluate the effectiveness of a 4-week self-management program, they found improvement in health-related quality of life post-implementation of the self-management program.

This study hypothesis was supported, by the mean and standard division of the five studied dimensions (pain, symptoms, daily living activities, stiffness, sports and recreational activities, and knee-related quality of life), comparison of these items pre-and post-implementation of the designed nursing guidelines revealed statistically significant differences regarding all of the items and there was a noticeable improvement as shown in the study results. There were statistically significant differences between pre-and post-implementation of the guidelines regarding all items, and there were marked improvements as evidenced in the study results by comparison of these items pre-and post-implementation of the designed nursing instructional guidelines.

Conclusion:

Implementation of instructional guidelines had a positive effect on selected health outcomes among the elderly with knee osteoarthritis.

Based on the findings of the present study, the following recommendations are suggested:

-          Develop and apply similar instructional guidelines to assess the needs and factors affecting such groups of patients.

-          Further studies measuring more health outcomes for long-term follow-up and larger samples are suggested for knee osteoarthritis elderly patients to generalize the results.

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