

Effect of Implementing Exercise Program on Pain and Physical Functions among Patients with Moderate Knee Osteoarthritis

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Abstract

Background: Osteoarthritis (OA) is an irreversible degenerative joint condition that causes pain and disability for around 10% of total population. Therapeutic exercise is the first line of treatment that can reduce pain, enhance physical function, improve quality of life as well as save time and cost. **Aim of study:** Was to evaluate the effect of implementing exercise program on pain and physical functions among patients with moderate knee osteoarthritis. **Design:** A quasi-experimental design was utilized. **Setting:** The study was conducted at the outpatient clinic of the Physical Medicine, Rheumatology and Rehabilitation, El-Hadara Orthopedic and Traumatology University Hospital, Alexandria, Egypt. **Subjects:** Fifty patients with moderate knee osteoarthritis (KOA) were recruited. **Tools of data collection:** Three tools were utilized, **I:** Self- Reported Questionnaire: Western Ontario and McMaster (WOMAC) OA Index, and Visual Numeric Pain Scale (VNS). **II:** Clinical Based Data Assessment (Body Mass Index). **III:** Mobility Index of patients with knee osteoarthritis. **Results:** There was highly significant improvement of pain, stiffness, physical function disability, VNS, knee range of motion, time up and go, and 30 S-Chair-stand test, post exercise program intervention ($P < 0.001$). **Conclusion:** Implementation of exercise program for moderate KOA patients had decreased pain and promote physical functions among patients with KOA. **Recommendations:** Prospective studies are recommended to evaluate the effect of long term application of the exercise program for those patients with KOA.

Keywords: Exercise program, Knee osteoarthritis, Pain, Physical function

Introduction

Knee osteoarthritis (KOA) is one of most prevalent types of arthritis. Knee osteoarthritis is a degenerative condition that affects the articular cartilage and surrounding structures (Robbins et al., 2019). The main etiology of KOA is still ambiguous, in spite of presence of many factors that can be divided into three major categories; systemic factors, intrinsic joint vulnerability factors and extrinsic factors. Radiographically, KOA can be classified according to Kellgren-

Lawrence (KL) scale into three stages: mild, moderate, and severe. Clinical manifestations of KOA include: joint pain, stiffness, crepitation, instability of knee and reduction of joint range of motion (Domínguez-Navarro et al., 2020).

Osteoarthritis condition has not be cured or reversed. As a result, the goal of contemporary disease management is to reduce pain, enhance physical function and retard the development of the disease. In light of this, management of KOA can be divided into non-pharmacological,

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pharmacological and surgical intervention (Dadabo et al., 2019). Regarding non-pharmacological interventions, it involved core first-line management that comprised patient education, therapeutic exercises and weight control. Whereas pharmacological treatments include oral drugs as paracetamol, non-steroidal anti-inflammatory drugs (NSAIDs), and local intra-articular injections as steroids and hyaluronic acid injections that can cause potential systemic complications. Surgical interventions can be ranged from arthroscopic lavage and debridement or osteotomy to the total knee arthroplasty (Power et al., 2019).

Thus, KOA patients need a management strategies that can save time and cost. Within this context, evidence based guidelines recognized that therapeutic exercise should be the first line treatment regardless of the degree to which the disease has progressed. Therapeutic exercises can be applied by different modes such as individual treatments, class based or group programs as well as home based programs (Geenen et al., 2018).

The benefits of therapeutic exercises can be decline over time if KOA patients have not adhere to it. On that basis, home based exercises is recommended as a safe and flexible intervention, time and cost- effective with limited contraindications (Nicolson et al., 2018).

Significant of the Study

Knee osteoarthritis incidence cases is around 240 per 100,000 people yearly (Magnusson et al., 2019), and the global prevalence in adults over 18 years reached to 31 % (Vina & Kwoh, 2018). In parallel, KOA prevalence in Egypt was 29.2 per 1000, which are embodies a public health burden (Mahmoud et al., 2019). Therefore, the purpose of this study was to explore how an exercise program affected pain and physical function among patients with moderate KOA.

Aim of the study

This study aimed to evaluate the effect of implementing an exercise program on pain and physical functions among patients with moderate knee osteoarthritis.

Research Hypothesis

- 1- Patients with moderate knee osteoarthritis who would be exposed to the exercise program exhibit lower self-reported pain mean score.
- 2- Patients with moderate knee osteoarthritis who would be exposed to the exercise program exhibit higher self- reported physical function mean score.
- 3- Patients with moderate knee osteoarthritis who would be exposed to the exercise program exhibit higher knee range of motion and physical function performance score.

Subjects and Methods

Research Design:

A quasi experimental, research design was used to fulfill the aim of the study.

Setting:

The current study was carried out at outpatient clinic of the Physical Medicine, Rheumatology and Rehabilitation, El-Hadara Orthopedic and Traumatology University Hospital, Alexandria University, Egypt.

Sample:

The study populations were adult patients with moderate knee osteoarthritis, who attending the above mentioned setting. A purposive sample of 50 patients was constituted the study participants and was exposed to the exercise program.

Sample Inclusion Criteria

- Adult patients from both sexes.
- Age ranging from 21-60 years.

- Diagnosed with bilateral moderate knee osteoarthritis (MKOA) (Kellgren &Lawrance, 1957, tool 2 part II).
- Willing to take part in this study.
- They had not attended previous exercise program.

Sample Exclusion Criteria:

- Contraindications for physical exercises interventions because of comorbidity e.g., peripheral vascular diseases, obesity (BMI ≥ 27.0), cardio vascular diseases, renal disorder, visual disorder, stroke, neuropathies, diabetes mellitus.
- Sever conditions of KOA and any other trauma in the body were excluded from this study.

Tools of data collection:

Three tools were utilized to obtain the data of this study:

Tool 1: Self- Reported Questionnaire:

- This tool was comprised four parts:
- **Part I:** Patients' socio demographic characteristics: this part included the patients' age, gender, educational status and occupation (Alhamo et al., 2019).
- **Part II:** Patients' medical history: this part was adapted from Firestein et al., 2017, it included duration of disease, comorbidity, prescribed medications and frequency of using it.
- **Part III:** Intensity of symptoms assessment, according to Western Ontario and McMaster (WOMAC) Osteoarthritis Index:

- This index was adapted from Bellamy et al., 1988, it is a self-reported physical disabilities questionnaire that attempts to identify the changes in daily functional challenges outcomes encountered by patients with KOA who exposed to exercise program.

It comprises 24 questions in three subscales: pain (5 questions), stiffness (2 questions), and physical functions disability (17 questions).

Scoring system: On the Likert scale, each question had five alternatives; where 0= no constraints or difficulties, 1 = slight, 2=moderate, 3=severe, 4= extreme constraints. The highest score for each subscale on WOMAC on the Likert scale was: 20 for pain, 8 for stiffness and 68 for physical function. The highest total score (96) denotes worse or more symptoms and the strongest physical constraints. In the current study, the Arabic version of the Western Ontario and McMaster Universities (WOMAC) index, which validated by Guermazi et al., 2004, was adapted and utilized.

Part IV: Visual Numeric Pain Scale (VNS):

The visual numeric pain scale (VNS) was adopted from Ritter et al., 2006, to measure pain intensity. **Scoring system:** The patient choose a number from (0-10) that represent the degree of pain. It is categorized as follow: 0 = no pain, 1-3 = mild pain, 4-6 = moderate pain and 7-10 = sever pain

Tool 2: Clinical Based Data Assessment: It included two parts as follow:

-Part I: The Body Mass Index BMI:

It involved assessing weight (kg) and height (cm). Weight was divided by height square (kg/m²) to calculate the body mass index (BMI). **The BMI was classified into four categories:** underweight (BMI<18.5), ideal weight (18.5≤BMI<24.0), overweight (24.0≤BMI<27.0) and obese BMI ≥ 27.0 (Guidelines for Taiwan, 2011).

-Part II: Kellgren and Lawrence, (1957) (KL) grading:

It aimed to determine changes in knee degeneration. The patients' knee plain x-ray

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was used to assess this grading. It was based on a doctor's order in outpatient clinics to confirm that the patients in this study had moderate knee OA. (Kellgren and Lawrence, 1957).

Tool 3: Mobility Index of Patients with Knee Osteoarthritis.

This tool was designed to measure physical functions performance, it was divided into three parts:

- Part I: Knee Range of Motion:

This part was adopted from Glynn & Weisbach 2011, based on a review of the literature, a goniometer was used to evaluate the flexibility of the knee joint while conducting a range of motion test. Normal knee ROM was considered zero degree on extension; 140 degrees on flexion. The obtained was compared against normal levels. (Glynn & Weisbach, 2011).

- Part II: Time Up and Go Test (TUG).

The "Time Up and Go test" was adopted from Podsiadlo & Richardson, 1991, to measure functional performance among patients with KOA, time was used for data analysis.

-Part III: 30-Seconds Chair Stand Test (30s-CST).

The 30-seconds chair stand test was adopted from Jones et al., 1999, to measure lower-body muscles strength and postural stability. Data obtained was used for analysis.

The exercise program hand out:

The exercise program hand out has been designed by the researcher following thorough review of relevant literatures, and was used for teaching and training participants to fulfillment the study aim. The content of the exercise program was organized in two main parts: **Part 1: Theoretical part:** It covered the theoretical

information about KOA and included brief anatomy and physiology of knee, sign and symptoms, complications, and the role of exercises in alleviating the disease symptoms.

Part 2: Practical part (exercise sessions): It was allocated for exercises that must be performed initially under supervision by the researcher, and then applied by the participants at their home.

Validity and reliability:

- Tools were examined for content validity by a five expertise in rheumatology and medical surgical nursing to determine the clarity, relevance, applicability and comprehensiveness of the tools. The appropriate modifications were done.
- Reliability was tested using Cronbach's alpha coefficients for tool 1 part III (WOMAC scale) which was (0.89). While, the test-retest reliability for tool 3 part I (ROM), part II (Time Up and Go Test) and part III (30-seconds Chair Stand Test) were ($r = 0.97, 0.92, 0.90$) respectively, which indicates a good reliability.

Ethical considerations:

- The researcher clarified the objective and the study aim to all study participants.
- The researcher assured maintaining privacy of all participants' data for the purpose of this research only.
- All participants included in the study were informed about their right to participate or withdraw from the study at any time without any rational.

Pilot study:

A pilot study was conducted on 10% of the study subjects (**5 patients**) from hospital under study for testing tools' clarity and applicability, and as a consequence, the appropriate adjustments were done. Those participants were not included in the study.

Field of work

Data collection was started, and continued for a period of 9 months from March 2021 to November 2021. The study was carried out in the following phases:

Assessment phase (pre exercise program intervention):

After physician have confirmed the diagnosis of moderate KOA in accordance with x-ray studies using **tool 2 part II**, the aim of study was explained to each patient separately, and their informed consent was obtained. The questionnaire (**tool 1 part I, II**) was fulfilled by the researcher; it was comprised sociodemographic data and medical history; as well as self-reported Western Ontario and McMaster (**WOMAC**) Osteoarthritis Index, pain scale were assessed as a baseline data assessment using tool 1 (**part III, IV**); weight, high and BMI were calculated using **tool 2** and mobility index was obtained using tool 3 (**part I ROM, II TUG & III 30s- CST**).

Planning and implementing phase:

The KOA exercises were developed based on previous researches which demonstrated the patients' improvement in their physical functions (**Clausen et al., 2017**). Once assessment had been finished by the researcher; illustrative colored hand out was designed by the researcher, and provided for each study participant. Visual learning aids were prepared (poster and booklet). Methods of teaching and training were done individually for each participant using education, exercise demonstration, and re-demonstration in the outpatients clinics. The exercise program lasted six weeks (18 sessions). This duration was in line with **Fransen et al., 2015**. The exercises were consisted of three parts: warming up, KOA exercises (stretching, strengthening and functional exercises) and cooling down.

The intervention of exercise program:

- In the initial identification sessions, the researcher introduced his/her-self, and the aim of the current study. The first session lasted about 60 minutes, and assigned to inform the participants about KOA and the vital role of physical exercises in managing it. The second and third sessions lasted about 60 minutes, and allocated for training participants. The fourth session lasted about 45 minutes, and designed to ensure that participants performed the exercises appropriately by themselves.
- Then, the participants informed to perform the demonstrated exercises at home, held three sessions a week on alternate days for 6 weeks (18 sessions). A weekly booster telephone calling or clinical meeting at out-patient clinic was conducted to recognize any participant needed a further training or has problem.
- To allow progression, each exercise had a three levels of difficulty. It was achieved by; changing the number and/or adding a resistance (weight); the patients upgraded level every two weeks. Feel of pain at the beginning of the new level had been accepted if it was up to 5 on a 0-10 pain scale during and post the training session. pain should decreased to the usual pain level the day after training (**Ritter et al., 2006**).
- Safety of the patient was instructed by using hand support or back of a chair or wall to avoid falling.

Recommended progression rate guidelines:

- If the patients unable to increase the level of the exercises after 2 weeks for any reason , they remained on that level for another week.
- If the patients experienced any deterioration in their conditions as

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increased level of pain or swelling lasting more than one day after their exercises, they returned to a previous level.

Evaluation Phase: (Post Exercise program intervention)

The effectiveness of exercise program were evaluated on the 4th and 6th weeks. It was determined by observing for differences or no differences in physical disability outcomes and pain intensity before and after the exercise program intervention using **tool 1 (part III, IV)** as well as mobility index using **tool 3 (part I, II, III)**.

Statistical analysis:

Data were entered to the computer, it was analyzed using IBM SPSS program version 20.0. (Armonk, NY: IBM Corp). The Kolmogorov-Smirnov test was applied to confirm the normality of distribution. Numbers and percentages were used to describe qualitative data. The mean and standard deviation were used to describe quantitative data. The significance of the reported results was judged at a 5% level.

The used tests were:

- ANOVA with repeated measures:** For normally distributed quantitative variables, to compare between more than two periods or stages.
- Friedman test:** For abnormally distributed quantitative variables, to compare between more than two periods

Results:-

Table (1) reveals that 40% of studied subjects were from 40 < 50 years old and 78% of them were females. For their education, 30% and 36% of the studied participants were among Secondary and University levels, respectively. Regarding their working condition, 50% were employees and 30% were housewives,

additionally, more than half of them (56%), had to stand and walk most of time during their work, For comorbidity, 36% of them have comorbid diseases, as hypertension which represented 83.3%. besides 70% of study subjects had family history of KOA.

Table (2) shows that there was a high statistically significant differences in overall WOMAC score throughout the study periods (**p <0.001****). The improvement in overall WOMAC score was found post sessions of exercise intervention on 4th and 6th weeks with mean score 48.30 ± 14.67 and 43.78 ± 16.93 , respectively compared with pre intervention score (53.98 ± 12.25), with P values <0.001**.

Figure (1) illustrates the percent change of the studied knee osteoarthritic patients according to their Visual Numeric Pain Scale (VNS) from pre to post exercise program intervention. The percent change increased in term of improvement, on 4th and 6th week, post exercise intervention by -21.7 and -24.98, respectively.

Table (3) shows differences in mean scores of the studied knee osteoarthritic patients according to their knees' range of motion pre and post exercise intervention. For the right knee, there were statistically significant differences with extension and flexion throughout study periods (**p= 0.004***, **p <0.001***), respectively. In relation to the left knee, there were statistically significant improvements in both knee extension and flexion (**p= 0.008***, **p <0.001***) respectively.

Table (4) shows statistically significant improvements in TUG and 30s-Cst tests, after implementation of the exercise program (**p <0.001***), in addition, the improvement concerning the both tests were found on the 4th week post intervention (**p <0.001***), which continued to the 6th week **with p <0.001***.

Table (1): Percentage distribution of the studied KOA patients according to their socio demographic characteristics and medical history (n = 50)

Patients' Socio Demographic Characteristics & Medical History	No.	%
Age		
21 < 30	6	12.0
30 < 40	8	16.0
40 < 50	20	40.0
50 ≥ 60	16	32.0
Mean ± SD	43.86 ± 10.35	
Sex		
Male	11	22.0
Female	39	78.0
Educational level		
Illiterate	4	8.0
Read and write	6	12.0
Primary education	7	14.0
Secondary education	15	30.0
University education	18	36.0
Working condition		
Employee	25	50.0
Worker	10	20.0
Housewife	15	30.0
Nature of work		
Carrying heavy objects	10	20.0
Sitting most of time	12	24.0
Standing and walking most of time	28	56.0
Comorbidity		
Yes	18	36.0
No	32	64.0
Underlying diseases *	(n = 18)	
Hypertension	15	83.3
Hypothyroidism	1	5.6
Asthma	2	11.1
Thyroidectomy	2	11.1

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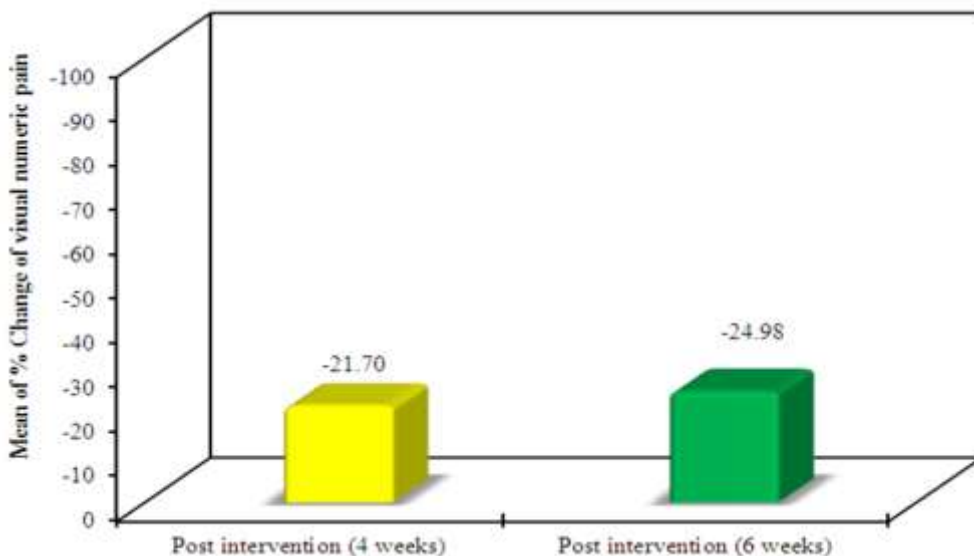


Figure (1): Percent change of the studied knee osteoarthritic patients according to their Visual Numeric Pain Scale (VNS) from pre to post exercise program intervention (n = 50).

Table (2): Significant differences of the studied KOA patients according to their experienced intensity of symptoms (pain, stiffness & physical disability) pre and post exercise intervention (n = 50):

WOMAC (Intensity of Osteoarthritis Symptoms)	Pre Intervention	Post intervention		F	P3
		4 th week (12 sessions) P1	6 th week (18 sessions) P2		
Pain					
Mean ± SD	10.08 ± 2.98	9.0 ± 3.57	8.70 ± 3.91	28.267*	<0.001**
Post Hoc Test (P value)		<0.001**	<0.001**		
Stiffness					
Mean ± SD	4.10 ± 1.74	3.76 ± 1.96	3.46 ± 2.14	9.348*	0.001**
Post Hoc Test (P value)		0.024*	0.005*		
Physical Function					
Mean ± SD	39.80 ± 8.92	35.54 ± 10.41	31.62 ± 12.14	64.466*	<0.001**
Post Hoc Test (P value)		<0.001**	<0.001**		
Overall WOMAC					
Mean ± SD	53.98 ± 12.25	48.30 ± 14.67	43.78 ± 16.93	54.783*	<0.001**
Post Hoc Test (P value)		<0.001**	<0.001**		

Table (3): Means, standard deviations and significant differences of the studied Knee osteoarthritic patients; according to their practicing range of motion, pre and post exercise intervention: (n = 50):

	Knees ' Range of Motion	Pre Intervention	Post Intervention		Fr	P3
			4 th week (12 sessions) P1	6 th week (18 sessions) P2		
Right knee	Extension Degree Mean ± SD.	2.20 ± 5.07	2.0 ± 4.52	1.0 ± 2.67	11.290*	0.004**
	Post Hoc Test (P value)		0.803	0.211		
	Flexion Degree Mean ± SD.	115.20 ± 15.68	118.20 ± 14.91	120.40 ± 13.73	56.581*	<0.001**
	Post Hoc Test (P value)		0.001*	<0.001*		
Left knee	Extension Degree Mean ± SD.	2.20 ± 5.45	2.10 ± 4.64	1.20 ± 3.12	9.657*	0.008**
	Post Hoc Test (P value)		0.960	0.250		
	Flexion Degree Mean ± SD.	116.10 ± 17.12	118.60 ± 15.94	121.70 ± 15.14	55.511*	<0.001**
	Post Hoc Test (P value)		0.051	<0.001**		

Table (4): Mean score and significant differences among the studied knee osteoarthritic patients; according to their physical function performance (Time Up and Go Test and 30-Seconds Chair Stand Test), pre and post exercise intervention (n = 50).

	Pre Intervention	Post Intervention		Fr	P3
		4 th week (12 sessions) P1	6 th week (18 sessions) P2		
Time Up and Go Test (TUG)/ Seconds Mean ± SD	11.48 ± 3.52	10.54 ± 3.82	10.32 ± 4.19	26.482*	<0.001**
Post Hoc Test (P value)		<0.001**	<0.001**		
30-seconds Chair Stand Test (30s-CST)/ Times Mean ± SD	8.18 ± 2.79	9.46 ± 3.51	9.62 ± 3.42	33.403*	<0.001**
Post Hoc Test (P value)		<0.001**	<0.001**		

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Discussion:

Knee Osteoarthritis (KOA) is the most common type of arthritis disorder which can predispose significant functional limitations (Dadabo et al., 2019). The current study aimed to evaluate the effect of implementing exercise program on pain and physical functions among patients with moderate knee osteoarthritis.

The current findings revealed that two fifths of the studied patients, their ages were 40-< 50 years. This may be an evidence of the early aging process among the current study KOA population. This finding agrees with an Egyptian study supported by Mohamed & Mohamed (2019), about “Effect of Local Heat Application on Complaints of Patients with Moderate Knee Osteoarthritis”. They stated that the majority of their participants were aged from 40-50 years old.

Besides, more than three fourths of the studied patients were female. It may be due to the faster loss rate of articular cartilage in female than male; in addition to the difference in bone and neuromuscular strength between male and female (Webster & Feller 2017; Ferre et al, 2019; Fathi, 2019). This finding is in line with Pietrosimone et al. (2020), who conducted a study titled “Using TENS to Enhance Therapeutic Exercise in Individuals with Knee Osteoarthritis”. They found that the majority of their study participants were female.

For **comorbidity**, nearly one third of the studied patients have comorbid diseases, and the majority of them have hypertension. It might be explained by the shared traditional risk factors between hypertension and KOA; such as aging process, obesity, and chronic inflammation. Furthermore, multiple genes are affected in both hypertension and osteoarthritis. Moreover, the pro-inflammatory cytokine interleukin-6 responsible for hypertension and KOA, also,

polymorphisms in the vitamin D receptor, may be related to low bone density, osteoarthritis and hypertension (Zhang et al., 2017). This finding is in line with the study conducted by Lin et al., (2020) about “Active video games for knee osteoarthritis improve mobility but not WOMAC score”. They concluded that the majority of their studied patients had comorbid diseases.

Concerning self-reported intensity of symptoms, it was statistically and clinically significant improvement in level of pain after implementing the exercise program. It may be due to the dynamic effect of exercise influence the knee cartilage by squeezing and moving the fluids in and out the matrix, which promote growth of cartilage and, accordingly joint restoration as well as relieving knee pain (Yang et al., 2021). This result is similar to the finding of a study carried out by Karadag et al. (2019), that compared the effect of heat application with implementation of the home exercise program, on pain and level of function for patient with knee osteoarthritis. They reported the influence of home exercise upon static pain (VNS) and dynamic pain (WOMAC scale).

For overall WOMAC scale, the current study revealed statistically significant improvement after implementing the exercise program. This results could be linked to relieve of pain after exercise program completion, which is the first indicator and motivator for functional and daily living activities enhancement. (Nur et al., 2018). This finding is in line with the study done by Hameed et al., (2017) about “Effect of Manual Therapy on Knee Osteoarthritis Pain”; who reported the amelioration of the overall WOMAC scale. On the other hand, the current study result is contradicted with the study carried out by Allen et al. (2018). They evaluated the effectiveness of physical therapy (PT, evidence-based method) and internet-based exercise training

(IBET), among KOA patients, each to a control group. They highlighted that there were no significant differences improvements in the total WOMAC score, and subscales (WOMAC pain and function); between the control group and intervention groups; neither IBET nor PT at 4 or 12 months. It may be due to absence of follow up of exercise adherence at home.

Regarding Time Up and Go Test and 30-seconds Chair Stand Test, the current findings reflected statistically significant improvement after application of the exercise program. This findings might be related to the diminished level of fear from falling as they are getting used to perform exercises; which have a direct influence on elevated level of functional performance. (Asar et al, 2020). This findings are in line with Gohir et al. (2021) study about “Effectiveness of Internet-Based Exercises Aimed at Treating Knee Osteoarthritis”. They suggested that remote treatment information ,which represented by smartphone application, can provide an effective amelioration for KOA patients regarding physical function performance (TUG and 30s-CST) in addition to contracting the burden of KOA treatment on health care systems.

On other side, another study done by Allen et al., (2018), entitled “Physical therapy vs internet-based exercise training for patients with knee osteoarthritis”; disagrees with these findings. They mentioned that their internet-based exercise training cannot affect physical function performance positively.

Regarding ROM measurements, the extension and flexion degrees of both knees showed statistically significant improvement after completion of the exercise program. These findings are in agreement with a Turkish study which was done by Yilmaz et al., (2019) about “Comparison of effectiveness of the home exercise program and the home exercise program taught by physiotherapist in knee osteoarthritis”. They admitted that there were

statistically significant improvements in ROM values in both groups. On contrary, the study of Silva et al., (2018), about “Feasibility of a home-based therapeutic exercise program in individuals with knee osteoarthritis”; contradicts with the present study result, because their program hadn’t affect ROM significantly. It might be interpreted by the small sample size of study.

Conclusion:

Implementation of exercise program awarded those with moderate KOA; is a valuable treatment option to relieve their pain and enhance physical function.

Recommendations:

- Integration of the home exercise program into the plan of management for KOA patients, in the all health care levels (primary, secondary, tertiary).
- Prospective studies are recommended to evaluate the effect of long term application of the exercise program.
- Evaluation of the effectiveness of other types of exercise such as tai chi, and balance for individuals with KOA.

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تأثير تطبيق برنامج التمارين الرياضية على الألم والوظائف الجسدية لمرضى الفصال العظمي للركبة من الدرجة المتوسطة

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الفصال العظمي هي حالة مزمنة تساهم في الألم والعجز لحوالي ١٠٪ من إجمالي سكان العالم وتعتبر التمارين الرياضية المنزلية هي طريقة مرنة، فعالة، قليلة التكلفة ولها فوائد عدة في تخفيف الألم وتحسين الوظائف الجسدية. لذا هدفت الدراسة إلى تقييم تأثير تطبيق برنامج التمارين الرياضية على الألم والوظائف الجسدية لمرضى الفصال العظمي للركبة من الدرجة المتوسطة. وقد أجريت هذه الدراسة في العيادات الخارجية بقسم الطب الطبيعي و الروماتيزم والتأهيل ، بمستشفى الحضرة الجامعي لجراحة العظام والكسور ، بجامعة الإسكندرية. تم تطبيق هذه الدراسة على عينة هدفية لعدد (٥٠) من المرضى البالغين المصابين بالفصال العظمي للركبة من الدرجة المتوسطة. كشفت نتائج الدراسة عن تحسن معتد به إحصائياً بعد تنفيذ برنامج التمارين الرياضية ($P < 0.001$) في نتائج التقييم الذاتي للوظائف الجسدية (WOMAC)، مقياس الألم البصري الرقمي بالإضافة الى تحسن أداء الوظائف الجسدية مثل زيادة المدى الحركي للركبة ؛ انخفاض نتيجة اختبار وقت القيام والذهاب و ارتفاع نتيجة اختبار الوقوف من الكرسي لمدة ٣٠ ثانية. وقد أوصت الدراسة بالمزيد من الابحاث المستقبلية لتقييم تأثير تطبيق برنامج التمارين الرياضية طويلة الأمد ومتابعة مرضى الفصال العظمي للركبة.