

Non-pharmacological nursing intervention protocol: impact on patients' knowledge, compliance and performance activity of daily living among women with knee osteoarthritis

Samia M. T. Osman¹, Essam A. M. Ahmoud²

Adult Nursing, Faculty of Nursing Assiut University, Egypt. Taibah University, Saudi Arabia1
Rheumatology & Rehabilitation, Faculty of Medicine- Assiut University, Egypt.2

Corresponding Author: Samia M. T. Osman

Abstract

Background: Osteoarthritis (OA) are the most common type of arthritis and by two thousand twenty is predictable to become the fourth leading reason of infirmity, global ranks fourth among medical problems in women. Osteoarthritis of the knee is the leading cause of disability in adults, causes pain, stiffness, swelling, joint instability and muscle weakness, all of which can lead to impaired physical function and reduced quality of life. Non-pharmacological interventions are the foundation for osteoarthritis management and should be continued during the patient's treatment period.

The aim of the study: The aim of the current study was to evaluate the impact of non-pharmacological intervention protocol on patient's knowledge, compliance and activity of daily living among women with knee osteoarthritis.

Setting: The study was conducted at the Rheumatology & Rehabilitation Department-Assiut University Hospital.

Subjects: Fifty adult 50 patients with osteoarthritis were recruited for the study.

Tools: four tools were used to assemble data relevant to the study. These were: Socio-demographic data sheet, osteoarthritis's knowledge questionnaire, compliance tool and Barthel index scale.

The results: the results show that, statistically significant differences between the pre and posttest mean scores were found in participants' knowledge about osteoarthritis, statistical significant correlations between patient' knowledge and activity of daily living.

Conclusion, non-pharmacological interventions are essential for management of chronic illness and they are as important as pharmacological management. non-pharmacological interventions safe, effective, low in cost, improving function and quality of life for patients with knee Osteoarthritis.

Recommendations, it recommended that, non-pharmacological intervention must be integrated in routine patients' management, health caregiver must take part in patient teaching and further research around the impact of non-pharmacological intervention on patient's long term outcome and interventions to support, enhance patient's compliance are required.

Key word: Non-pharmacological intervention, knowledge, compliance, activity of daily living, women, osteoarthritis

Date of Submission: 18-09-2018

Date of acceptance: 03-10-2018

I. Introduction

Osteoarthritis (OA) is a deteriorating joint disease and one of the most common musculoskeletal disease all over the world (Litwic₂ et al 2013). The most prevalent OA is the knee joint, and symptomatic knee OA affects twenty-four percent of the general population (Pereira et al 2011). OA by two thousand twenty is expected to become the fourth main cause of disability, global ranks fourth among medical problems in women., high prevalence in the Netherlands for male 14.3/1,000 and female 23.8/1,000. (Labia, Brien, Fransen& Jan 2013). Asokan (2011), Neogi & Zhang (2013) added that, the prevalence of symptomatic Knee osteoarthritis (KOA) is more common in female about 47 % than in male (40%). Increased incidence of KOA is due to an inactive lifestyle, diet and work environment conditions among the adult population (Esser & Bailey 2011).

KOA is one of the most common joint illness worldwide, but the clinical pattern of KOA may be changed in different peoples due to lifestyle and everyday activities (Hawamdeh & Al-Ajlouni, 2013). Patient with KOA complain of dull aching on movement, fatigue, functional limitations, increased health care utilization, costs to society, effect on the health and quality of life (Hafez et al 2013) Cross et al., 2014; Hubertsson et al., 2013.

Hochberg, et al, (2012), Wang et al (2014), Thorstensson, Garellick, Rystedt & Dahlberg (2014) reported that, non-pharmacological interventions are the basis of treatment and should be offered to all patients with KOA as early as possible during the course of their disease. The goal of the management is to relieve pain, disability, increase functional capability and improve quality of life. The components of non-pharmacological therapy are; patient education, physical therapy, exercise, weight reduction, educations of the patients and caregivers (Evcik (2015) added that, areas of patient education involve management of pain, balance between rest & activity, nutrition and maintaining independence in self-care activities. Constructing patient education programs help patients achieve this role by giving them the knowledge and practical skills they need for self-care.

Brooker, Nicol, and Alexander (2011) stated that, patient self-management is vital to osteoarthritis treatment and the nurses can play essential leading role in assisting patients to develop the necessary knowledge and skills to do this. Nurses can offer the education and support for the patient that can lead to better symptom control, management and improvement in overall patient's quality of life. For that, the study will be designed to assess the impact of non-pharmacological nursing intervention protocol on patient's knowledge, compliance and performance of activity of daily living among women with knee osteoarthritis.

II. The aim of the study

This study designed to assess the impact of non-pharmacological nursing intervention protocol on patient's knowledge, compliance and activity of daily living among women with knee osteoarthritis.

III. Subjects and Methods

Study hypotheses:

Patients with KOA achieve required knowledge, better compliance and activity of daily living performance after implementation of the intervention protocol.

Research design:

A quasi- experimental research design was utilized in the present study. The study group acted as their own control where the post tests were compared to pretest scores.

Setting: The study was conducted at the Rheumatology Department- Assiut University Hospital.

Subjects: Fifty adult patients with knee osteoarthritis were recruited for the study. **The inclusion criteria** were: newly diagnosed with osteoarthritis, ambulatory patients, their age ranged from 35 to 60 years and willing to attend the educational sessions. **Patients were excluded** if they had: malignant disease, spinal problems and had undergone recent surgery.

Tools: Four tools were used to assemble data relevant to the study. These were:

Tool I: Biosocial-demographic data. This was constructed by the researchers to gather data about patient's age, occupation, education and marital status.

Tool II: osteoarthritis's knowledge questionnaire: designed by the researcher, was used to assess patients' knowledge about osteoarthritis background and its management at baseline, immediately after implementation of the intervention protocol and at 2-month follow up. It consists of 30 multiple choice and open questions offered to patients through a structured interview by the researcher. Scoring system: The total scores were 60 points allotted as follows; complete answer (2), incomplete (1) and wrong answer (0). Classified as a good level of knowledge (50- 60 points), moderate level (40-45 points) and poor level (30- 35 points).

Tool III: Compliance tool (self-report questionnaire): developed by the researcher to assess patient's performance and compliance to therapeutic regimen, exercise & activities at home and Rheumatology Unit, evaluate the patient's response as (regularly comply or never comply).

Tool IV: Barthel scale (Mahoney&Barthel, 1965): used to assess activities of daily living (ADL). It uses ten variables describing ADL (feeding, moving from wheelchair to bed & return, personal toilet, getting on & off

toilet, bathing self, walking, propelling a wheelchair, ascending & descending stairs and dressing), each item is rated on this scale with a given number of points assigned to each ranking. The higher score indicates "independent person". Total scores range from 0 to 100. The Barthel index has demonstrated high inter-rater reliability (0.95) and test-retest reliability (0.89). The 10-item has an alpha internal consistency coefficient of 0.87 to 0.92. (O'Sullivan Susan; Schmitz, Thomas, 2007).

Procedure:

- Formal written approval was obtained from the director of the Rheumatology Department- Assiut University Hospital.
- Development tools of the study; tool I, II & III was constructed by the researcher after revising related literature and tested for content validity by 3 experts in Nursing and Orthopedic fields. While the third tool developed by (Mahoney&Barthel, 1965).
- A pilot study was conducted on 5 patients to test the feasibility, applicability of the tools, data were gotten from the pilot study were omitted from the current study.
- Participants socio-demographic data, knowledge level, compliance and Barthel activities of daily living index were obtained as baseline data using tools I, II, III and IV.
- The intervention protocol was developed by the researcher according the patient's needs after reviewing the relevant literature. The content of the protocol includes the theoretical and practical part. The intervention protocol has been implemented in 6 sessions, these sessions were repeated for each group (2-4 patients), the time allowed for each session about 20 minutes, including 5 minutes for feedback.
- The two theoretical sessions about knowledge related to osteoarthritis, to explain the benefits of specific exercises and to enhance the patients' motivation to exercise and four sessions related to the practical part around how to use assistive devices, moist compresses, carrying objects, joint protection measures and exercise to strength muscle. The sessions were done by the researcher in simplified language using pictures, brochure, demonstration and re-demonstration as educational methods. Number of sessions were, according to patients' needs.
- Finally, assess knowledge level, compliance and activities of daily living by using the II, III and IV tools immediately after implementation of the protocol and after 2 months for.

Ethical consideration:

A verbal agreement was granted from the patients; the purpose of the research was clarified for each patient before conducting the study. Voluntary participation, confidentiality of the patients was assured.

Statistical analysis:

Using SPSS to analyze data, frequency, percentage distributions, means & standard deviations, correlation coefficient and ANOVA test were carried out.

IV. Results

Table (1) illustrates socio-demographic characteristics of the patients, the most of the patients were married (80%) and their age ranged between 45 and 60 years, with Mean ± SD 50.2 ± 4.2. The highest percentages of the patients were illiterate and housewives 52% and 64 % respectively.

Table (1): Socio-demographic characteristics of the patients.

Variables	Patients (n= 50)	
	No.	%
Age: (years)		
• < 40 years	5	10.0
• 40 - < 45 years	16	32.0
• 45 - 60 years	29	58.0
Mean ± SD	50.2 ± 4.2	
Marital status:		
• Married	40	80.0
• Single / divorced	10	20.0
Occupation:		
• Housewife	32	64.0
• Worker	18	36.0
Level of education:		
• Illiterate	26	52.0
• Read and write	19	38.0

• University education	5	10.0
Residence:		
• Urban	22	44.0
• Rural	28	56.0

Table 2 & figure 1: illustrate the distribution of patients' knowledge level, the mean scores of total and subtotal patients' knowledge before, immediately after and 2 months follow up after implementation of the intervention protocol. Shows that, highest mean score and level of knowledge was after implementation of the protocol also shows a high statistical significant difference between the pre and posttest mean scores for participants' knowledge at $P < 0.05$.

Table 2: The mean scores of patient's knowledge before, immediately after, and 2 months follow up after intervention protocol implementation.

Items	Before Mean \pm SD	Immediately after Mean \pm SD	Follow up Mean \pm SD	P
Knowledge regarding osteoarthritis background	3.74 \pm 3.46	13.58 \pm 1.83	14.04 \pm 1.39	0.000*
Knowledge regarding management of osteoarthritis symptoms	12.22 \pm 3.12	24.36 \pm 2.77	24.28 \pm 2.12	0.000*
Knowledge regarding nonpharmacological intervention	20.44 \pm 8.33	35.38 \pm 5.12	38.14 \pm 3.51	0.000*
Total knowledge scores	45.82 \pm 16.14	94.24 \pm 11.53	96.72 \pm 7.68	0.000*

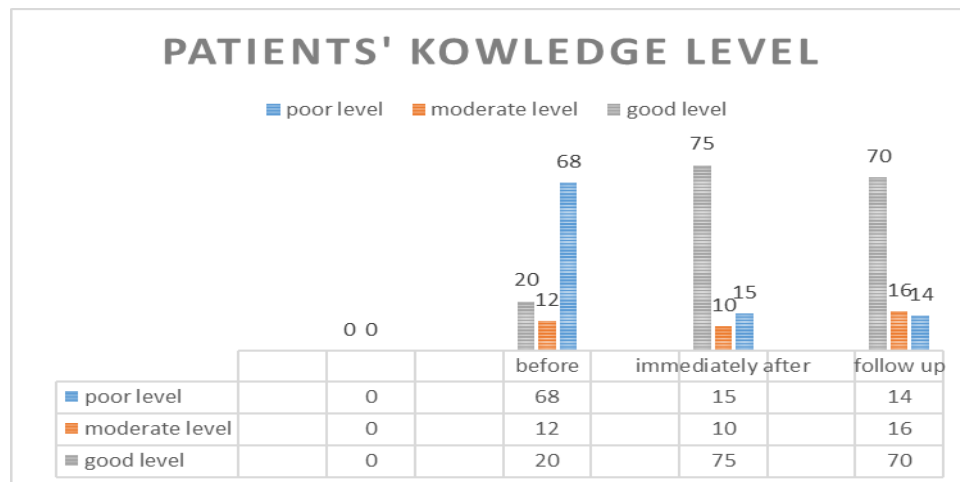


Figure (1) Distribution of patients' knowledge level before, immediately after, and 2 months follow up after intervention protocol implementation

Table (3) shows that, high statistical significant differences regarding activities of daily living between before and immediately after follow-up mean scores. Patients activity of daily living improved significantly at post intervention and at follow up $P < 0.05$.

Table (3): Patients' mean scores of activity of daily living before, immediately after, and 2 months follow up after protocol implementation

	Before	Immediately after	Follow-up 2 months	P-value
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Activity of daily living	85.50 \pm 7.62	95.32 \pm 5.43	94.90 \pm 5.39	0.000*

* Statistical significant difference ($P < 0.05$)

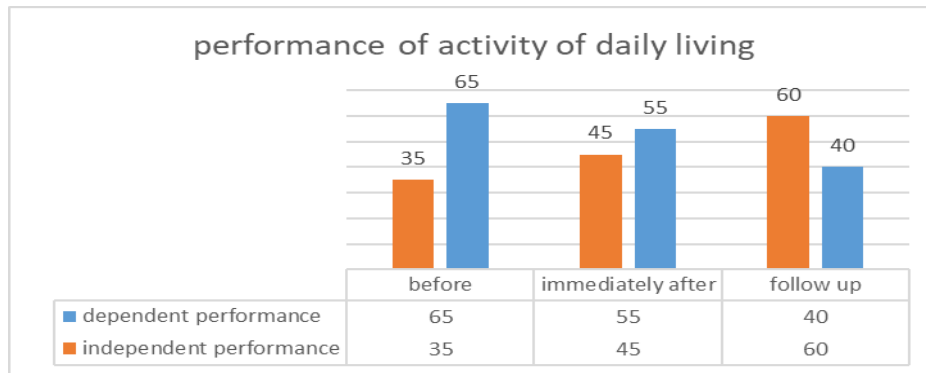


Figure (2) Distribution patients' level of performance of daily living before, immediately after, and 2 months follow up after intervention protocol implementation. Figure 2 shows that, more than half of the subject were having a dependent level of performance of daily living activity before protocol implementation while after protocol implementation 35 % of the subjects had an independent level of performance for activity of daily living

Table 4 shows that, most of the patients were adhered to physiotherapy in the hospital before implementation of the intervention protocol. However, 74% of subjects were adhered to exercise at home after implementation of the intervention protocol with a statistical significant difference at $p = 0.001$. Figure

Table (4): Patients' compliance to the physiotherapy exercises at the hospital and home

Items	Before (n= 50)	After (n= 50)	Follow-up 2 months (n= 50)	P-value
	No.%	No. %	No.%	
Physical therapy at the hospital:				
• Compliance	30 (60.0)	45 (90.0)	40 (80.0)	1.00
• No Compliance	20 (40.0)	5 (10.0)	10 (20.0)	
Exercises at Home:				
• Compliance	23 (46.0)	37 (74.0)	30 (60.0)	0.001
• No Compliance	27 (54.0)	13 (26.0)	20 (40.0)	

Table (5) shows correlation coefficient between patient' knowledge and activity of daily living. There were statistical significant correlations between patient' knowledge and activity of daily living.

(5): Correlation coefficient between patient' knowledge and activity of daily living

Item	r-value	P-value
Activity of daily living	0.033	0.201

V. Discussion

Osteoarthritis (OA) is a big problem worldwide and one of the most common reasons of disability in the adult population. In the Western world, it ranks as the fourth in health impact of female patients. Osteoarthritis causes pain, reduced muscle strength, range of joint motion, effect on the physical functioning of daily life, joint instability and reduced patients' quality of life (Pisters, 2010, Miller & Block, 2014).

As regard occupation, the present study illustrates that, more than two third of the patients' occupation are a housewife, this result could be attributed to using improper body mechanics in house activities and physical functioning of daily living. This study finding was supported by Abdel Elkhaliq (2013) and Carol (2012) who found that, occupations that need repetitive overuse of joints and loading lead to great biomechanical stresses and can lead to OA. Frequent kneeling, bending, standing, heavy weight lifting and climbing stair can cause strange loading through the joint and articular injury (Bieleman et al, 2010).

Conservative non-pharmacological interventions play a basic role in the controlling of OA symptoms and disability. (Janssen, Mihov, Welting, Jens & Emans 2014). Sakalauskiene, Jauniškienė, poliklinika & Silainiai (2010) added that, non-pharmacological interventions are crucial for the management of chronic illness, low in cost, enable patient's self-management at home and have a substantial an impact on health status.

Also the American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) recommendations, non-pharmacological methods are important as medications, and the two should be used in combination for managing of KOA (Hochberg, et al 2012). Education plays crucial to successful management of the disease and the nurse a main role as patient educator. The patient and their relatives require information around the osteoarthritis and strategies to reduce its effect. Efficient teaching can assist the patient to make a positive change, modifications in their behavior, control symptoms and health condition (Joyce & Jane, 2009, Hawkeswood & Reebye 2010).

The current study revealed a great lack of patient's knowledge before intervention protocol implementation, patients were having an unsatisfactory knowledge level. This finding could be attributed to lack of patient instruction about how to deal with osteoarthritis and the majority of study patients were illiterate. This finding in line with Abdel Abdel Elkhaliq (2013) & Carol (2012) who added that, an accurate assessment of the patient's educational level must be made before an effective program can begin.

After application of the intervention protocol, patients' knowledge level was significantly improved. This finding supported by Joyce & Jane, 2009, Hawkeswood & Reebye 2010, Abdel Elkhaliq 2013) who stated that, patient's education is crucial to successful management of the illness, improvements of the function and quality of life. Patient's education known as an essential element of OA management. The nurse plays a main role to educate the patient and their relatives the required information around the osteoarthritis and strategies to reduce its effect. Efficient teaching can assist patients with osteoarthritis in taking an active role, to make a positive change, modifications in their behavior, symptom control and improving health condition.

Moreover, the findings of the current study illustrated that, deficiency of compliance toward home exercises with more than half of the subjects before application of the intervention protocol, while immediately after protocol implementation highest percent of patients comply to home exercise. This finding supported by Hawkeswood & Reebye (2010) who reported that, compliance can be enhanced through qualified disease education and exercise demonstration also Yusuf (2016) added that, it is important to educate the patient about the purpose of OA management to increase therapeutic adherence. Better compliance is associated with better patients' outcome of pain, physical function, and self-perceived effect. Noncompliance to therapeutic regimen may worsen the disease and can prohibit achieving management goals efficiently, resulting in poor health outcome, deteriorate the quality of life and increase the cost of health care (Pisters et al 2010).

Individuals with KOA may have limitations that impair their capability to perform activities of daily living, this impairment affects patient's ability to work, function in their community and care for their family and responsibilities. (Snizek, Brady & Marks, 2010).

The results of the current study revealed that, most of the patients had an improvement regarding performance of daily activities immediately after and follow-up periods of the implementation of the intervention protocol, this in line with the finding of Metwaly et al (2017) also the finding supported by Murphy, Robinson-Lane & Schepens Niemiec (2016) who reported that, physical activity, exercise, controlling weight and healthy diet and self-management plays a vital role in the management of KOA, helping to strength the muscles around the affected joints, control joint ache, inflammation and increasing functional capacity. muscles strength will lessen pressure on the joints and absorb shock to protect joints from injury.

VI. Conclusion

KOA is a major reason for musculoskeletal disability worldwide. Non-pharmacological interventions remain the key for management of chronic illness and they are important as pharmacological interventions. Most non-pharmacological interventions are safe, effective, low in cost, improving function and quality of life for patient with knee OA, though their use is often suboptimal, which permits more knowledge clarification to health caregiver and patients around their importance in improving health outcomes. The current study found that, the offered non-pharmacological intervention protocol was effective in improving patient's knowledge, compliance to therapeutic exercises and perform activities of daily living. Patients demonstrated elevation of independence's level about performance of activity of daily living in post and follow-up periods.

VII. Recommendations

Based on the results of the present study, can suggest that, non-pharmacological intervention must be integrated in routine patients' management, health caregiver must take part in patient teaching and further research around the impact of non-pharmacological intervention on patient long term outcome. Interventions that support and enhance patient's compliance are required.

References

- [1]. Litwic, A.E., Edwards, M.H., Dennison, E.M., Cooper, C., Epidemiology and burden of osteoarthritis. *Br Med Bull.* 2013;105:185-99.
- [2]. Pereira D, Peleteiro B, Araújo J, Branco J, Santos RA, Ramos E., The effect of osteoarthritis definition on prevalence and incidence estimates: a systematic review. *Osteoarthritis Cartilage* 2011; 19:1270–85.
- [3]. Laba, T., Brien, J., Fransen, M., & Jan, S., Patient preferences for adherence to treatment for osteoarthritis: the medication decision in osteoarthritis study (MEDOS). *BMC Musculoskeletal Disorders* 2013, 14:160.
- [4]. Asokan, G.V., Hussain M.H., Ali E.M., Awate, R.V., Khadem, Z. K.A., and Al-Safwa Z.M., Osteoarthritis Among Women in Bahrain: A Public Health Audit *Oman Med J Nov; 26(6), 2012, 426–430.*
- [5]. Neogi T, Zhang Y: Epidemiology of osteoarthritis. *Rheum Dis Clin N Am.* 39(1), 2013,1–19.
- [6]. Esser S, Bailey A. Effects of exercise and physical activity on knee OA. *Curr. Pain Headache Rep.* 2011; 15:423–30.
- [7]. Hawamdeh, Z.M. Al-Ajlouni, J.M., The clinical pattern of knee osteoarthritis in Jordan: A Hospital Based Study. *Int J Med Sci.* 2013; 10 (6):790-795.
- [8]. Hafez AR, Al-Johani AH², Zakaria AR, Al-Ahaideb A, Buragadda S, Melam GR, Kachanathu SJ, Treatment of knee osteoarthritis in relation to hamstring and quadriceps strength. *J Phys Ther Sci.* Nov;25(11), 2013,1401-5.
- [9]. Cross M, Smith E, Hoy D, Nolte S, Ackerman I, Fransen, M., Bridgett L, Williams S, Guillemin F, Hill CL, Laslett LL, Jones G, Cicuttini F, Osborne R, Vos T, Buchbinder R, Woolf A, March L., The global burden of hip and knee osteoarthritis: Estimates from the global burden of disease 2010 study. *Annals of the Rheumatic Diseases,* 73, 2014,1323–30.
- [10]. Hubertsson J, Petersson IF, Thorstensson CA, Englund M. Risk of sick leave and disability pension in working-age women and men with knee osteoarthritis. *Annals of the Rheumatic Diseases* 72, 2013, 401–5.
- [11]. Hochberg, M.C., Altman R.D., April K. T, Benkhalti M, Guyatt. G, Mcgowan. J, Towheed, T, Welch. V, Wells. G, and Tugwell. P. American College of Rheumatology 2012 Recommendations for the Use of Non-pharmacologic and Pharmacologic Therapies in Osteoarthritis of the Hand, Hip, and Knee. *Arthritis Care & Research* 64 (4), April 2012;465–474.
- [12]. Wang C, Iversen M D, McAlindon T, Harvey W F, Wong J B, Fielding R A, Driban J B, Price L. L, Rones R, Gamache T and Schmid C.H. Assessing the comparative effectiveness of Tai Chi versus physical therapy for knee osteoarthritis: design and rationale for a randomized trial. *BMC Complementary and Alternative Medicine.* The official journal of the International Society for Complementary Medicine Research (ISCMR) 2014. 14:333
- [13]. Thorstensson, C., Garellick, G., Rystedt, H. & Dahlberg, L. Better Management of Patients with Osteoarthritis: Development and Nationwide Implementation of an Evidence-Based Supported Osteoarthritis Self- Management Programme. *Musculoskelet. Care* 13 (2015), 67–75.
- [14]. Evcik, D. Non-pharmacological knee osteoarthritis treatment Volume, September 2015, 33.
- [15]. Brooker, C., Nicol, M., & Alexander, M., *Alexander's Nursing practice* 4th ed, Mosby, 2011, pp.358-381.
- [16]. Mahoney, F.I. & Barthel, D.W. Functional evaluation: The Barthel Index" *Maryland state Med Journal.* 14, 1965, 61-5.
- [17]. O'Sullivan, Susan B; Schmitz, Thomas J. *Physical Rehabilitation, Fifth Edition.* Philadelphia, PA: F.A. Davis Company. 2007, p. 385.
- [18]. Pisters, M.F., Veenhof, C., Schellevis, F.G., Twisk, J.W., Dekker, J., Bakker, D. de. Exercise adherence improves long-term patient outcome in patients with osteoarthritis of the hip and/or knee. *Arthritis Care and Research: 62(8), 2010, 1087-1094.*
- [19]. Miller, L.E. and Block J.E. An 8-Week Knee Osteoarthritis Treatment Program of Hyaluronic Acid Injection, Deliberate Physical Rehabilitation, and Patient Education is Cost Effective at 2 Years Follow-up: The Osteoarthritis Centers of America SM Experience. 2014.
- [20]. Abdel Elkhaliq, E.F., Impact of designed educational program on Osteoarthritis patient's outcome at EL-Minia University Hospital. Thesis submitted for partial fulfilment of the requirement of the Doctorate Degree in Adult Nursing. Faculty of Nursing- Assiut University, 2013.
- [21]. Carol, M., Assessing for risk and progression of osteoarthritis. The nurse's role. *American journal of nursing.* 112(3), 2012, 26-31.
- [22]. Bieleman, H.J et al, Work participation and health status in early osteoarthritis of the hip and / or knee. Comparison between the Cohort Hip and Cohort Knee osteoarthritis initiative. *Arthritis Care Res., 62(5), 2010, 689-9.*
- [23]. Janssen, M., Mihov, G., Jens T., and Emans, P. (2014): Drugs and Polymers for Delivery Systems in OA Joints: Clinical Needs and Opportunities *Polymers,* 6, 799-819.
- [24]. Sakalauskiene, G., Jauniškienė, D., poliklinika, K.Š., Silainiai, K. The use of non-pharmacological approaches in management of osteoarthritis. *Medicinos teorija ir praktika* 2010 - T. 16 (Nr. 2). 166-172.
- [25]. Joyce, B. & Jane, H., *Medical Surgical Nursing* 8th. 2009, p 474.
- [26]. Hawkeswood, J and Reebye, R., Evidence-based guidelines for the nonpharmacological treatment of the hip and knee *Issue: BCMJ,* 52(8), 2010, 399-403.
- [27]. Yusuf, E. Pharmacologic and Non-Pharmacologic Treatment of Osteoarthritis *Curr. Treat Options in Rheum* 2016 2:111–125.
- [28]. Sniezek, T., Brady, J. & Teresa, J. (2010): *Encyclopedia of the public health.*
- [29]. Metwally E. A, Taha, N.M., Seliem. H. A, Sakr, M.D. Effectiveness of Non-Pharmacological Nursing Intervention Program on Female Patients with Rheumatoid Arthritis. *cent eur j nurs midw* 8(3), 2017, 682–690.
- [30]. Murphy S. L, Robinson-Lane S. G. & Schepens Niemiec S. L. Knee and Hip Osteoarthritis Management: A Review of Current and Emerging Non-Pharmacological Approaches. *current Treatment Options in Rheumatology.* December 2 (4), 2016, 296–31.