

Research Article

Impact of Elderly Women's Knee Osteoarthritis Pain on Daily Living Activity at Northern Upper Egypt

Hanan Elzeblawy Hassan^{1*}, Mariam Riad Fahmy², Eman Mohamed Alshrbieny³

¹Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt

²Nursing Specialist Beni-Suef University Hospital, Egypt

³Community Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt

*Correspondence author: Hanan Elzeblawy Hassan, Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt;
Email: nona_nano_1712@yahoo.com

Citation: Hassan HE, et al. Impact of Elderly Women's Knee Osteoarthritis Pain on Daily Living Activity at Northern Upper Egypt. J Ortho Sci Res. 2023;4(1):1-10.

<https://doi.org/10.46889/JOSR.2023.4108>

Received Date: 01-03-2023

Accepted Date: 17-04-2023

Published Date: 25-04-2023



Copyright: © 2023 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CCBY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract

Background: The most common cause of discomfort in old age is osteoarthritis. The age range between 55 and 64 years old has the largest annual incidence of knee osteoarthritis. 65 and younger make up more than half of those with symptomatic knee OA. Women make up 62% of those with osteoarthritis. **Aim:** The current study's objective is to determine the effect of osteoarthritis pain in the knees of older women on their ability to carry out everyday activities in Northern Upper Egypt.

Setting: The investigation was conducted in the orthopaedics outpatient clinic and the physiotherapy unit at Beni-Suef University Hospital.

Subjects: In the current study, 300 studied women were recruited using a non-probability consecutive sampling technique.

Tools: Katz scale, interview questionnaire, and Visual Analog Scale (VAS).

Results: showed that more than one-third (40%) of the elderly women in the study had knee joint problems from less than five years ago and 70% of them experienced severe pain. Additionally, 30% of the women in the study required supervision, guidance, personal assistance, or complete care when getting dressed, and 90% reported fatigue, 71.3% anxiety, and 70% limited social participation. **Conclusion:** The pain of osteoarthritis in older women has an impact on their social, psychological, and physical health.

Recommendations: Through targeted programs to people in the community, raise public awareness of osteoarthritis pain and complications.

Keywords: Elderly; Knee Osteoarthritis; Women; Daily Living Activity

Introduction

The most prevalent kind of aging-related pain is Osteoarthritis (OA), which affects 88% of adults age 45 or older and affects 43% of patients who are 65 or older. The age group between 55 and 64 has the largest annual incidence of knee OA. The average age of people with symptomatic knee OA is under 65. 62 percent of people with OA are female. Men are more likely to have OA than women do after the age of 45 among those under 45 [1-3]. Knee osteoarthritis is either characterised as primary or secondary depending on the underlying aetiology. Primary knee osteoarthritis results from unidentified factors causing articular cartilage to deteriorate. This is typically viewed as degeneration caused by ageing and regular wear and tear. Secondary knee osteoarthritis develops from articular cartilage degeneration caused by a known aetiology. [4-6].

Modifiable risk factors include articular trauma, occupation, extended standing and frequent knee bending, muscular weakness or imbalance, weight, and health conditions like metabolic syndrome are risk factors for knee OA. Non-modifiable factors include ethnicity, age, gender (females are more common than men), and genetics [7-9]. Secondary knee OA may result from a number of conditions, including post-traumatic, post-surgical, congenital or malformed limbs, malposition (varus/valgus), rickets,

hemochromatosis, chondrocalcinosis, ochronosis, wilson disease, gout, pseudogout, acromegaly, avascular necrosis, rheumatoid arthritis, infectious arthritis, psori. For clinical symptoms of knee OA, it has been shown that knee pain typically comes on gradually, gets worse with prolonged activity, gets worse with repetitive bending or climbing stairs, gets better with rest, gets better with ice or anti-inflammatory medication, and gets worse with decreased ambulatory capacity, all of which have an impact on the patient's psychological state and can cause anxiety and depression (Fig. 1) [13-15].



Figure 1: Signs and symptoms of osteoarthritis [16].

Pain, joint stiffness, joint dysfunction, crepitus, altered gait instability, and restricted range of motion are the major signs of OA. Chronic pain in the knee joint is the earliest and most prevalent sign of OA development at clinical presentation. Although not fully understood, mechanoreceptors in the subchondral bone and synovial cavity as well as nociceptor fibres have been proposed as possible sources of the pain. According to some theories, hyperalgesia and pain in the affected area are caused by elevated levels of Excitatory Amino Acids (EAA), mainly glutamate, released from sensory neurons in the spinal cord [17-19].

When cartilage is unable to keep the regular space between two bones, friction between the bones is thought to be the cause of discomfort. Joint gap narrowing, also known as whitening of the subchondral bone in plain X-ray, is characterised by the loss of radiolucent cartilage. The precise mechanical causes of pain in OA, in addition to the shrinking of the joint space, also include osteophytes growing with periosteal stretching, elevated intra-osseous pressure, subchondral microfractures, ligament damage, capsular stress, meniscal injury, and synovitis [20]. Osteoarthritis (OA) pain progression; early stage intense, predictable pain, typically caused by a mechanical injury, occasionally limiting high-impact activities, potential minimal influence on function, Mild to moderate pain that comes on more frequently with sporadic stiffness spells. The discomfort starts to interfere with daily activities; mature stages; continuous throbbing pain with intermittent, brief bursts of intense, terrible pain that greatly impairs function [21]. With OA, stiff joints are a common symptom. As the joint is thought to be rigid, stiffness may be experienced as difficulty or discomfort when moving the joint. Joint stiffness is largely caused by a deficiency in Surface-Active Phospholipid (SAPL), the synovial surfactant. Although stiffness is typically most noticeable right away in the morning, it can also happen later in the day, especially after periods of inactivity. Both morning and idleness-related stiffness quickly disappear in OA patients, but frequent use gradually makes the joint pain worse [22-23].

Aim of the Study

The aim of the current study is to assess the impact of elderly women's knee osteoarthritis pain on daily living activity at Northern Upper Egypt.

Research Questions

What is the impact of elderly women's knee osteoarthritis on daily living activity at Northern Upper Egypt?

Subjects and Methods

Research Design

A descriptive cross-sectional research design was utilized in the current study.

Subjects and Setting

Setting

The current investigation was carried out at the orthopaedics outpatient clinic and the physiotherapy section of Beni-Suef University Hospital.

Subjects

Sampling Size and Type

Using a non-probability consecutive sampling method, 300 elderly ladies who met the requirements were recruited.

Sample Criteria

Any elderly women suffering from knee Osteoarthritis (OA) pain and attended the study settings was selected in the study sample after fulfilled the following criteria.

Inclusion Criteria

- Elderly (age ≥ 65 years old)
- Diagnosed as having knee osteoarthritis (OA) for at least one year; this will be confirmed by chart review or medical report and history

Exclusion Criteria

- Cognitive impairment
- Life-threatening or functionally severely limiting health problems other than OA (e.g., cancer, Chronic Obstructive Pulmonary Disease COPD, etc.)

Tools of Data Collection

Tool (1) interviewing questionnaire: it was developed by the researcher; it contains Knee arthritis medical history. It aimed to assess patients' present medical history regarding the knee osteoarthritis.

Tool (2): Katz Scale

The original source for it is Katz, et al., [24]. It sought to measure elderly women with knee osteoarthritis' independence in terms of Activities of Daily Living (ADL). It covered the following 6 areas: showering, dressing, using the restroom, mobility, output control, and nutrition.

The Scoring System

Total global score of 6 for 6 items, were rated on two ranks as (with supervision, guidance, and personal assistance or complete care = Zero and without supervision or direction or personal assistance=1).

The total score of this scale classified into three categories based on the following:

Full function = 6

Moderate impairment = 4-5

Severe functional impairment = ≤ 3

Tool (3): Visual Analog Scale (VAS)

The original source is Hawker, et al., [25]. It was designed to evaluate the intensity of knee osteoarthritis pain in elderly women, and each box included a number from 1 to 10 to indicate how much pain the patient was experiencing.

The Scoring System

The total score of this scale was 10 and classified into three categories based on the following:

No pain = 0

Moderate pain = 1-6

Sever pain = 6-10

Validity and Reliability

- Content Validity: Five professionals in the field of community health nursing reviewed the instruments to see if they were complete, intelligible, applicable, clear, and appropriate for achieving the study's goal.
- Reliability: In the present study, reliability was tested using Cronbach's Alpha coefficients for Katz scale was 0.833, and visual analogue was 0.723.

Pilot Study

To test the clarity, applicability, practicality, and relevance of the instruments employed and to establish the amount of time required for their application, pilot research involving 30 patients (10% of the study subjects) was conducted.

Field Work

The study's older female participants were given a brief explanation of the study's goals by the researcher. The actual work for this study began in August of 2021 and was finished in eight months, from the beginning to the end of March (2022).

Ethical and Administrative Considerations

Before beginning the investigation, the faculty scientific ethical committee gave its clearance for the research. In order to gain authorization for data collection and assistance with conducting the study in their facilities, the nursing faculty at Beni-Suef University sent a formal written letter to the director of the hospital where the study was done.

Statistical Design

The information was gathered, coded, entered into the proper Excel sheet, and then properly statistically analyzed. The Statistical Programme for Social Science (SPSS) version 26.0 was used to analyze the data. Qualitative data were expressed as frequency and percentage, and quantitative data were expressed as mean Standard Deviation (SD).

Results

In results, Fig. 2 portrays percentage distribution of honest of knee joint problem among the studied elderly women. It reveals that, more than one-third (40%) of the studied elderly women had knee joint problem from ≥ 5 years. Fig. 3 presents frequency and percentage distribution of study elderly women' regarding their level of pain. It reveals that, more than two-thirds (70%) of studied elderly women had severe pain and (30%) of them had moderate pain level.

Frequency and percentage distribution of study elderly women' regarding independence in their activities of daily living showed in Fig. 4. It shows that, most (93%) of studied elderly women were take shower without supervision or direction or personal assistance, while, 30% of them were getting dressed with supervision, guidance, and personal assistance or complete care.

Also, Fig. 5 presents effect of elderly women's osteoarthritis on their physical wellbeing. It indicates that 100.0% of the studied women had impairment in physical activity, 90.0% of the studied women had fatigue, and 60.0% of them had insomnia. In Fig. 6, portrays effect of elderly women's osteoarthritis on their psychological wellbeing. It indicates that 71.3% of the studied women had anxiety and 42.6% of them had depression. Fig. 7 presents effect of elderly women's osteoarthritis on their social wellbeing. It indicates that 46.6% had guilt feeling and 70.0% of them had limitation in social participation.



Figure 2: Percentage distribution of honest of knee joint problem among the studied elderly women.

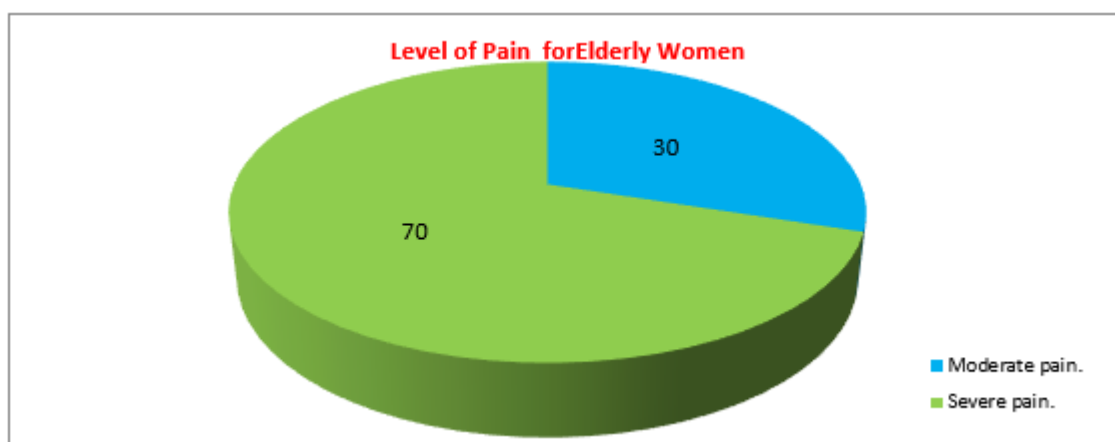


Figure 3: Percentage distribution of study elderly women' regarding their Total pain level.



Figure 4: Percentage distribution of study elderly women' regarding independence in their activities of daily living activity.

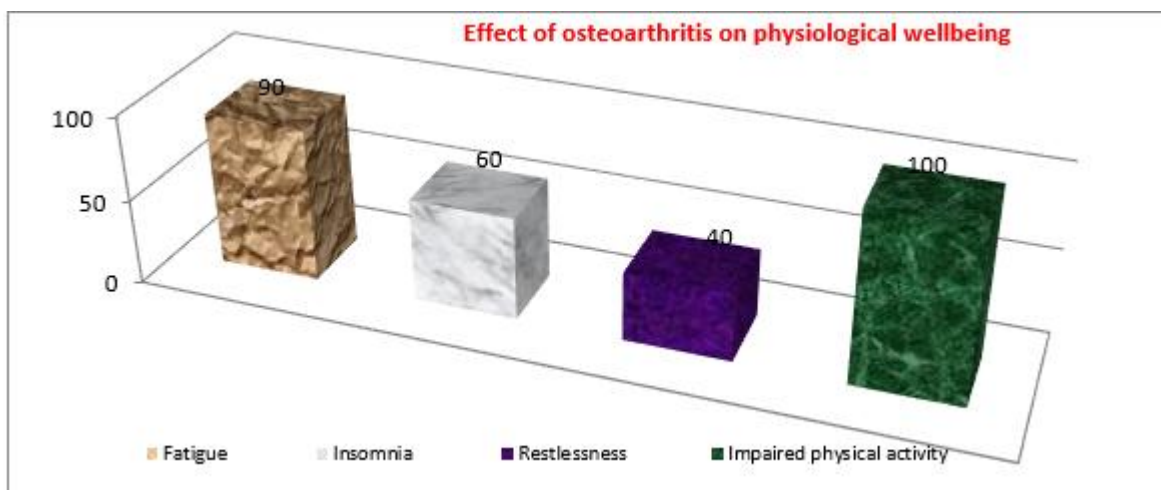


Figure 5: Effect of elderly women's osteoarthritis on their physical wellbeing.

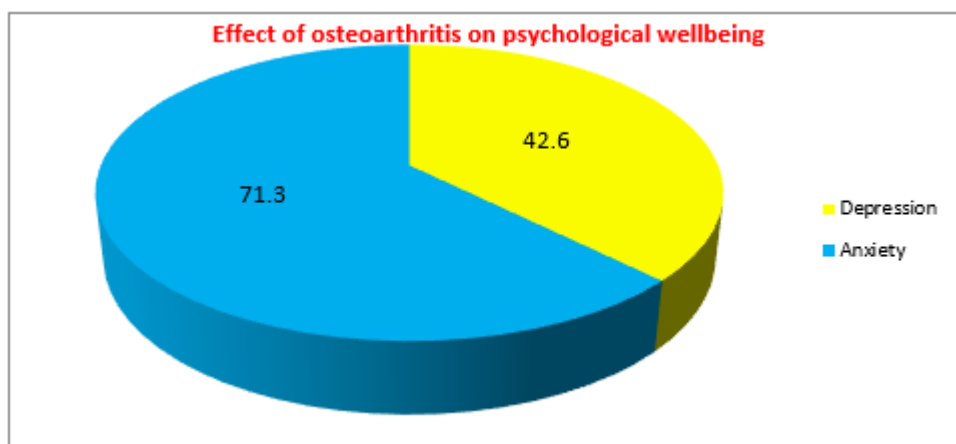


Figure 6: Effect of elderly women's osteoarthritis on their psychological wellbeing.

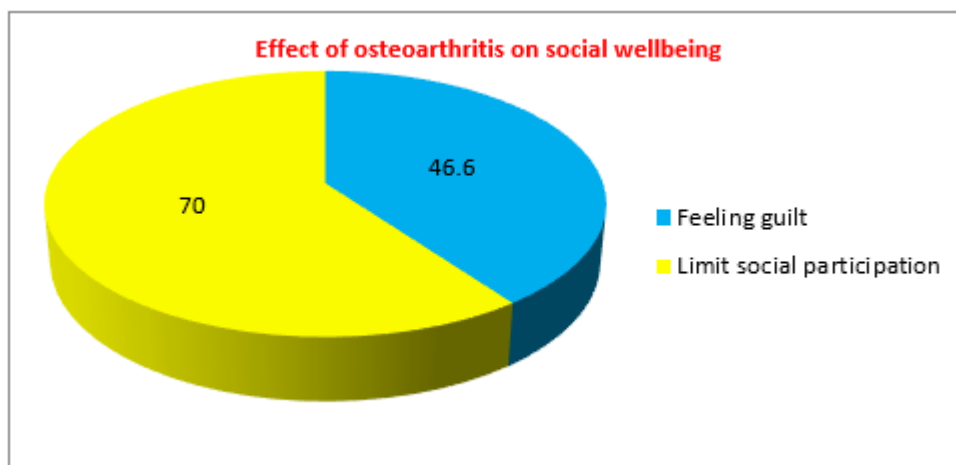


Figure 7: Effect of elderly women's osteoarthritis on their social wellbeing.

Discussion

Osteoarthritis is a degenerative, progressive, and chronic autoimmune disease with an uncertain cause. It is primarily characterised by synovial effusion and joint inflammation. A chronic autoimmune inflammatory disease that affects the joints and organs, OA also affects 5 out of every 1000 persons worldwide. Fatigue, joint pain, and swollen joints are frequent symptoms

that may impair physical function and negatively impact Quality of Life (QoL). Rheumatoid arthritis, a condition caused by an immune reaction in which the body attacks itself after mixing up its own tissues with foreign chemicals, affects 20 million individuals worldwide. This condition, roughness in the joints, and possible organ inflammation are all brought on by the illness [26].

The current study discovered that nearly half of the women had an overall moderate functional impairment when it came to the effect of OA on the investigated older women's independence in their daily activities. Also, nearly half of the study's female participants can dress themselves without any guidance, direction, personal care, or assistance. The fact that fatigue can have a major impact on patients' daily activities and overall quality of life may help to explain these findings [27]. It is frequently mentioned as one of the most challenging aspects of chronic rheumatic diseases. The causes of fatigue in arthritis are typically complex; in addition to the disease itself, other factors that may contribute to fatigue include psychological distress and medication use [24]. According to the current study's findings, the majority of the women who were studied had disabilities, a lack of energy, and insomnia as a result of their OA disorders, which had a negative impact on their physical wellbeing. These findings may be connected to the fact that synovial joints are the primary targets of rheumatoid arthritis, a chronic systemic inflammatory disease that also damages cartilage. Many patients experience diminished functional status and impairment as a result of this. OA may potentially present as an extra-articular condition.

These results are consistent with those of Mirzaei, et al., who stated that rheumatoid arthritis can impact most body organs, increasing mortality and morbidity rates [28]. Also, Jeihooni, et al., who noted that OA is the cause of a significant decline in physical activity came to the conclusion that physical exercise has numerous advantages for RA patients and ought to be widely practiced. A goal of therapeutic patient education for OA should be to encourage physical exercise [29]. The results of the current study indicated that the majority of the analyzed women experienced weariness, which is a physical consequence of OA. These results could be explained by the hypothesis that IL-6 triggers the HPA axis without compensating cortisol synthesis, leading to weariness. The impact of cytokines has been widely used to explain the genesis of fatigue in RA [30]. Also, Pope (2020) found that exhaustion is frequent across all rheumatic and musculoskeletal illnesses (RMDs), with considerable fatigue experienced by 41-80 of patients with rheumatoid arthritis (OA) [31]. These findings are in line with Pope's report. El-Sayed and Hassanein (2021) also noted that women with osteoarthritis and fibromyalgia reported a prevalence of fatigue ranging from 40% to 76%, respectively, while those with axial spondylo arthritis reported a prevalence of weariness ranging from 60 to 74% [32].

Patients with chronic conditions, such as osteoarthritis or arthritis, frequently experience sleep difficulties (OA). These results may be explained by the fact that in people with rheumatic diseases, poor sleep quality is strongly correlated with pain, mood, fatigability, stress, and disease activity. Several primary sleep abnormalities, including a high prevalence of obstructive sleep apnea, insomnia, and restless legs syndrome, have been seen in people with RA [1]. These results are consistent with those of Stlind, et al., who found that 72% of 100 RA patients had sleep disturbances [33]. More recently, Abdelaleem, et al., who carried out a study with 305 patients, came to the conclusion that ineffective OA management is linked to decreased sleep quality, which is probably explained by pain-related arousals [34]. People with osteoarthritis may experience negative psychological effects from the condition, such as mood swings, depression, and anxiety, due to the disease's persistent pain and advancing impairment. The results of the current study about how OA affects psychological health in the studied women showed that the majority of the women indicated that OA disease had a very unfavourable impact on their psychological status. These results might be explained by the fact that OA is a chronic and advancing disease and that a variety of psychosocial factors are involved. There is currently no cure for RA, however current medications may reduce the disease's course.

These results are consistent with Saffari, et al., observation that many OA patients experience stress due to their diminished mobility, increased disability, and diminished independence [35]. Those with RA are more likely to experience depressive symptoms, job loss, financial difficulties, social and relationship problems, and changes in relationship status [29]. The discomfort and limitations of osteoarthritis can also lead to depression and sleep problems. Knee osteoarthritis is diagnosed through physical examination, X-rays, and laboratory tests. Since there is no known cure for OA, patients must use a variety of therapies to manage their symptoms. These therapies may include increasing physical activity, physical therapy with muscle-strengthening exercises, weight loss, medications, including over-the-counter pain relievers and prescription drugs, supportive devices like crutches or canes, and surgery if other measures have failed [36]. The results of the current study showed that the

majority of the studied women indicated that the OA disease had a significant negative impact on their social status when it came to the impact of OA on social health. These results may indicate that OA may contribute to limitations in involvement in social or professional settings, challenges with daily living tasks, and issues with gender, culture, family roles, and identities [37-39].

These results are consistent with those of Srour and Saad, who showed how OA negatively affects the examined sample social dimension. They noted that dependency on others for everyday chores causes a loss of identity and independence, which can result in feelings of guilt and humiliation [40]. In order to ascertain whether the reduced engagement and reliance on others resulted in emotions of guilt and shame, researchers in the Netherlands contrasted people with and without OA [41].

Conclusion

According to the findings of the present study, the majority of the elderly ladies were in excruciating pain. Most of the older ladies in the study took showers on their own, without any guidance or personal assistance. Osteoarthritis pain in older women has an impact on their social, psychological and physical health.

Recommendation

The important recommendations inferred from the study results were:

1. Increase public awareness about Osteoarthritis pain and complications of osteoarthritis through directed program to persons in community
2. Periodic assessment for elderly women with osteoarthritis in Beni-Suef university hospital

Conflict of Interest

The authors have no conflict of interest to declare.

References

1. Shamekh A, Alizadeh M, Nejadghaderi SA, Sullman MJ, Kaufman JS, Collins GS, et al. The burden of osteoarthritis in the Middle East and North Africa region from 1990 to 2019. *Frontiers in Medicine*. 2022;9.
2. Fahmy MR, Hassan HE, Alsherbiy EM. Coping strategies among elderly women suffering from knee osteoarthritis pain at Beni-Suef city. *NILES J Geriatric and Gerontol*. 2023;6(1):148-66.
3. Ibrahim E, Mahmod A, Elmaghwry A, Hassan H. Compassionate care delivery: elderlies' perception. *Research in Psychology and Behavioral Sci*. 2021;9(1):24-32.
4. Manlapaz DG, Sole G, Jayakaran P, Chapple CM. Risk factors for falls in adults with knee osteoarthritis: a systematic review. *PMandR*. 2019;11(7):745-57.
5. Hassan H, Badr Elden S, Hamdi S, Aboudonya M. Control poly-pharmacy: elderly patients' practices. *Am J Pharmacological Sci*. 2021;9(2):56-62.
6. Hassanine Sh, Hassan H, Alkotb Z. Effect of preventive program on progression of osteoporosis among female patients over 40 years at El-Fayoum city. *Am Res J Nursing*. 2017;3(1):1-15.
7. Aweid O, Haider Z, Saed A, Kalairajah Y. Treatment modalities for hip and knee osteoarthritis: A systematic review of safety. *J Orthopaedic Surg*. 2018;26(3):230-45.
8. Hassan H, Badr Elden S, Hamdi S, Aboudonya M. Poly- Pharmacy among elderly patients: perception and practices. *J Nursing and Community Med*. 2021;1(1):1-6.
9. Sheha E, Hassan H, Gamel W. Association between pre-pregnant overweight and obesity and periodontal disease during pregnancy: a cross sectional study. *Int J Studies in Nur*. 2018;3(1):1-21.
10. Runhaar J, Zhang Y. Can we prevent OA? Epidemiology and public health insights and implications. *Rheumatol*. 2018;57(4):3-9.
11. Hassan H, Abozed A, Elmgwry A, Ibrahim E. Compassionate care: correlation and predictors of nurses' and patients' opinions. *Am J Public Health Res*. 2021;9(5):234-43.
12. Qalawa Sh, Hassan H. Implications of nurse's moral distress experience in clinical practice and their health status in obstetrics and critical care settings. *Clinical Prac*. 2017;6(2):15-25.

13. Ferri FF. Ferri's clinical advisor 2020: 5 books in 1. Philadelphia; Elsevier. 2019:1003.
14. Hassan H, Badr-Elden S, Hamdi S, Aboudonya M. Control poly-pharmacy: elderly patients' perception. *Am J Med Sci Med*. 2021;9(3):82-8.
15. Aboudonya M, Badr Elden S, Hassan H, Hafez S. Knowledge and practices used by old age patients to control polypharmacy. *Nile J Geriatric and Gerontol*. 2022;5(1):80-91.
16. Abdel-Aziz MA, Ahmed HM, El-Nekeety AA, Abdel-Wahhab MA. Osteoarthritis complications and the recent therapeutic approaches. *Inflammopharmacology*. 2021;29(6):1653-67.
17. Hassan H. The impact of evidence-based nursing as the foundation for professional maternity nursing practices. *Open Access J Reproductive System and Sexual Disord*. 2019;2(2):195-7.
18. Fu K, Robbins SR, McDougall JJ. Osteoarthritis: the genesis of pain. *Rheumatol*. 2018;57(suppl_4):iv43-50.
19. Hassan H. Evidence-based practice in midwifery and maternity nursing for excellent quality of care outcomes. *Am J Nursing Res*. 2020;8(6):606-7.
20. Wood MJ, Miller RE, Malfait AM. The genesis of pain in osteoarthritis: Inflammation as a mediator of osteoarthritis pain. *Clinics in Geriatric Medicine*. 2022;38(2):221-38.
21. Vincent TL. Peripheral pain mechanisms in osteoarthritis. *Pain*. 2020;161(1):S138-46.
22. Gustafson JA, Anderton W, Sowa GA, Piva SR, Farrokhi S. Dynamic knee joint stiffness and contralateral knee joint loading during prolonged walking in patients with unilateral knee osteoarthritis. *Gait and Posture*. 2019;68:44-9.
23. Hassan H, Abozed A, Mohamed A, Ibrahim E. Compassionate care delivery for elderly patients: nurses' perception. *Am J Applied Psychol*. 2021;9(1):22-35.
24. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jafle MW. Studies of illness in the aged. The index of ADL: Ea standardized measure of biological and psychosocial function. *JAMA*. 1963;185:914e9.
25. Hawker GA, Mian S, Kendzerska T, French M. Measures of adult pain: Visual analog scale for pain (vas pain), Numeric Rating Scale for pain (nrs pain), McGill Pain Questionnaire (mpq), Short-Form McGill Pain Questionnaire (sf-mpq), Chronic Pain Grade Scale (cpgs), short form-36 bodily pain scale (sf-36 bps), and measure of intermittent and constant osteoarthritis pain (icoap). *Arthritis Care Res*. 2011;63(S11):S240-52.
26. Raunsbæk Knudsen L, Lomborg K, Ndosi M, Hauge EM, de Thurah A. The effectiveness of E-Learning in patient education delivered to patients with rheumatoid arthritis: The WebRA study protocol for a pragmatic randomised controlled trial. *BMC Rheumatol*. 2021;5(1):401-6.
27. Clynes MA, Jameson KA, Edwards MH, Cooper C, Dennison EM. Impact of osteoarthritis on activities of daily living: does joint site matter? *Aging Clin Exper Res*. 2019;31:1049-56.
28. Mirzaei N, Mohammadi Shahbolaghi F, Nourozi K, Biglarian A. The effect of self-management training on self-efficacy of elderly patients with knee osteoarthritis. *Iranian J Rehabilitation Research in Nursing*. 2017;3(4):29-34.
29. Jeihooni AK, Fereidouni Z, Bahmandooost M, Harsini PA. The Effect of Educational Intervention on Promotion of Preventive Behavior of Knee Osteoarthritis in Women Over 40 Based on the Theory of Planned Behavior in Sample of Iranian Women. 2021;19(8):321-32.
30. Mueller A, Payandeh Z, Mohammadkhani N, Mubarak SM, Zakeri A, Alagheband BA, et al. Recent advances in understanding the pathogenesis of rheumatoid arthritis: New treatment strategies. *Cells*. 2021;10(11):317-21.
31. Pope JE. Management of fatigue in rheumatoid arthritis. *RMD Open*. 2020;6(1):e001084.
32. El-Sayed ZM, Hassanein SM. Effect of nursing instructional guidelines on fatigue and pain associated with knee osteoarthritis. *Egyptian Nursing J*. 2021;18(3):141.
33. Östlind E, Eek F, Stigmar K, Sant'Anna A, Ekvall Hansson E, Struglics A. Associations between physical activity, self-reported joint function, and molecular biomarkers in working age individuals with hip and/or knee osteoarthritis. *Clinical Medicine Insights: Arthritis and Musculoskeletal Disorders*. 2022;30(5):117-20.
34. Abdelaleem EA, Rizk YM. Health-related quality of life in Egyptian patients with knee osteoarthritis: correlation with performance-related measures. *Egypt Rheumatol Rehabil*. 2018;45(3):94-9.
35. Saffari M, Emami Meybodi MK, Sanaeinasab H, Karami A, Pakpour AH, Koenig HG. A theory of planned behavior-based intervention to improve quality of life in patients with knee/hip osteoarthritis: a randomized controlled trial. *Clin Rheumatol*. 2018;37:2505-15.
36. Sakellariou G, Conaghan PG, Zhang W, Bijlsma JW, Boyesen P, D'Agostino MA, et al. EULAR recommendations for the use of imaging in the clinical management of peripheral joint osteoarthritis. *Annals Rheumatic Dis*. 2017;76(9):1484-94.

37. Mohamed A, Hassan Omran AA, Hassan HE. Effect of deep breathing and kegel exercises on stress urinary incontinence among elderly women. Benha J Applied Sciences. 2023.
38. Fahmy MR, Hassan HE, Alsherbiyen EM. Coping strategies among elderly women suffering from knee osteoarthritis pain at Beni-Suef City. NILES J Geriatric and Gerontol. 2023;6(1):148-66.
39. Mohamed A, Hassan Omran AA, Hassan HE. Effect of deep breathing and Kegel exercises on stress urinary incontinence among elderly women. Benha J Applied Sciences. 2023.
40. Srour OA, Saad NS. Effect of Revulsive Compresses on knee associated symptoms and pain severity among patients with Knee osteoarthritis. Int Egyptian J Nursing Sciences and Res. 2022;2(2):397-412.
41. Jormand H, Mohammadi N, Khani Jeihooni P. Self-care behaviors in older adults suffering from knee osteoarthritis: Application of theory of planned behavior. Frontiers in public health. 2022;10(5):198-204.

Journal of Orthopaedic Science and Research



Publish your work in this journal

Journal of Orthopaedic Science and Research is an international, peer-reviewed, open access journal publishing original research, reports, editorials, reviews and commentaries. All aspects of orthopaedic health maintenance, preventative measures and disease treatment interventions are addressed within the journal. Orthopaedicians and other researchers are invited to submit their work in the journal. The manuscript submission system is online and journal follows a fair peer-review practices.

Submit your manuscript here: <https://athenaeumpub.com/submit-manuscript/>