

Effect of Knee Osteoarthritis on Quality-of-Life among Postmenopausal Females

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ABSTRACT

Background: Some observational evidence suggests an effect of hormones on Osteoarthritis (O.A.), especially in premenopausal women.

Aim: To determine the frequency of knee osteoarthritis among postmenopausal females. Secondly, assess the symptoms and severity of stiffness and pain. Thirdly, to assess the effect of Osteoarthritis on quality of life.

Methods: The study was conducted among 50 patients with knee osteoarthritis among postmenopausal females. Aged above 45 years were included in the study. Male Participants with Amenorrhea and Traumatic Knee Injury were excluded from the study. The non-probability sampling was used for sample selection. The sample size was calculated using an open-Epi tool.

Results: Most women with symptoms sometimes and often in knee osteoarthritis experience moderate and severe knee pain in rest and activity. Most women have moderate and severe difficulty in activities of daily living, difficulty in sport and recreation function, and disturbance in their quality of life in knee osteoarthritis of postmenopausal women. This study can help raise awareness and provide valuable insights into the challenges and limitations that postmenopausal women with knee osteoarthritis face daily. This can help develop more targeted and effective interventions that address the unique needs of this population.

Conclusion: The study concludes that postmenopausal females have knee osteoarthritis that produces symptoms with severe pain. Their functional, daily, sports and recreational activities are moderately affected by the quality-of-life effects.

Keywords: Knee Osteoarthritis, Postmenopausal women, Rehabilitation, Quality of life, Stiffness, Pain

INTRODUCTION

Osteoarthritis (O.A.) is a degenerative joint infection that causes joint irritation. It is characterized as a heterogeneous group of disorders that cause joint symptoms and signs¹. O.A. is a major cause of normal disability in both industrialized and developing countries and it is the cause of lost productivity². According to the World Health Report (2002), O.A. is the fourth biggest cause of years lived with disability worldwide, accounting for 3.0% of total global Y.L.D.s in 2000³. By 2020, it is projected that, as life expectancy rises, Osteoarthritis will be the fourth biggest cause of disability⁴. Osteoarthritis affects people of all ages; however, the prevalence rises drastically with age, after age 50 in men and 40 in women^{5,6}. The global prevalence of symptomatic O.A. is estimated at 9.6% among men and 18% among women⁷. Osteoarthritis (O.A.) is generally more standard in a lady than in men. The hazard of knee osteoarthritis tops in ladies after Menopause at the age of 50-60 years when contrasted with the man of the comparable period⁸.

Osteoarthritis is the fourth most common medical condition among women⁹. A substantial epidemiological review was directed in Italy, supporting the theory that estrogen inadequacy increments the danger of Osteoarthritis¹⁰. There is expanding proof that estrogen impacts joint tissues' action through complex atomic way beams that demonstrate at different levels¹¹. Observational examinations demonstrate that the pervasiveness of O.A. is expanded tremendously in postmenopausal ladies¹². The impact of estrogen on joint tissues has been concentrated in ovariectomized creature model. The effect of estrogen lack on ligament stays indistinct. However, there is critical proof of the unfavorable impact of estrogen misfortune in mature females¹³. Twenty-seven million individuals in the U.S. have Osteoarthritis. Around 60% of them are ladies before 55 years old man has more Osteoarthritis¹⁴.

Knee OA, the most common type of O.A., is the 11th leading cause of global disability and the 38th leading cause of disability-adjusted life years¹⁵. Prior joint injury, weight, sex, and anatomical factors linked to joint form and alignment may all play a role in the development of knee O.A.¹⁶. An investigation of premenopausal ladies in Michigan likewise showed that African Americans were almost more certain than white to have radiographic knee and hand osteoarthritis¹⁷. In Johnston Area, the predominance of radiographic knee osteoarthritis was equivalent in African Americans and white¹⁸.

The treatment is medications that soothe side effects like acetaminophen, salicylates, conventional nonsteroidal mitigating drugs, opioids, tramadol, skin absence of pain, and intraarticular glucocorticoid infusions. Other supportive medications are glucosamine sulfate, chondroitin sulfate, and diacerein¹⁹. There is a critical need to recognize viable and safe new pharmacological modalities for treating Osteoarthritis²⁰.

Overall, the study can provide important information that can improve the health and well-being of postmenopausal women with knee osteoarthritis and contribute to developing more effective healthcare policies and programs for the community. Limited research on the specific impact of knee O.A. on postmenopausal women's quality of life. While there is existing research on the effect of knee O.A. on QoL among different populations, such as older adults or women in general, there is limited research specifically focused on the impact of knee O.A. on QoL among postmenopausal women. This gap in research may be because knee O.A. is often studied in the context of aging, and postmenopausal women represent a specific subpopulation that requires more attention

This research aims to investigate the effect of knee osteoarthritis on the quality of life of postmenopausal females in Pakistan, Punjab.

Received on 12-10-2022

Accepted on 23-03-2023

METHODOLOGY

This observational study was conducted from July 2021 to October 2021.

Population: Postmenopausal females with knee osteoarthritis. Aged above 45 years were included in the study.

Sampling: The non-probability sampling was used for sample selection

Sample size: Fifty patients with knee osteoarthritis among postmenopausal females at the National Institute of Rehabilitation Medicine (N.I.R.M.), Islamabad. The sample size was calculated using an open-Epi tool.

Development of instrument: Demographic Questionnaire was constructed, and a Knee Osteoarthritis outcome scale (K.O.O.S.) was used.

Data collection procedure: All participants signed informed consent. K.O.O.S. questionnaire was used for sample collection.

Reliability and validity: According to the KOOS developers, the questionnaire has been shown to have high reliability, with Cronbach's alpha coefficients ranging from 0.79 to 0.97 for different subscales. Test-retest reliability coefficients range from 0.62 to 0.96 for different subscales²¹.

Inclusion and exclusion criteria: Fifty females were included in the criteria to meet the need; women aged less than 45 years and Traumatic Knee Injuries were excluded from the study.

Data analysis plan: SPSS window 20 was used for data analysis.

RESULTS

Fifty females were included in the study and divided into 5 groups according to age. 24 females lie in the age 50-55, 11 females lie in the age 56-60, 7 females lie in the age 61-65, and 4 females lie in the age of 66-70 and 71-75, respectively. 45 females are housewives, 1 is a government employee, 1 has a private job, 2 are social workers, and 1 female is disabled. The body mass index of females was Underweight in 1, Normal in 12, Overweight in 20, obese in 1 and more obese in 12 females. According to the Q.O.O.S. questionnaire, most women have symptoms sometimes and often in knee osteoarthritis, as shown in Table 1. Most women experience moderate and severe pain in the knee in resting and activity are shown in Table 2. Most women have moderate and severe difficulty in activities of daily living, difficulty in sport and recreation function, and disturbance in their quality of life in knee osteoarthritis of postmenopausal women shown in tables 3, 4, and 5.

Table 1: Frequency and percentage of symptoms

Symptoms	Never	Rarely	Sometime	Often	Always
	Frequency	Frequency	Frequency	Frequency	Frequency
Swelling	10	5	14	12	9
Grinding & clicking	6	5	14	15	10
Catch or hang up	0	8	24	13	5
Straighten fully	7	6	17	15	5
Bend fully	6	6	19	18	1
Stiffness in morning	2	12	14	18	4
Stiffness sitting, lying, or resting	3	13	14	16	4

Table 2: Frequencies and percentage of pain.

Pain	None	Mild	Moderate	Severe	Extreme
	Frequency	Frequency	Frequency	Frequency	Frequency
Knee pain	1	3	10	29	7
Twisting/pivoting	1	8	21	19	1
Straightening fully	0	10	21	18	1
Bending fully	1	13	18	17	1
Walking on a flat surface	2	16	19	12	1
Going up or down stairs	1	4	15	26	4
At night while in bed	3	8	15	21	3
Sitting or lying	3	9	15	20	3
Standing upright	1	6	22	19	2

Table 3: Frequencies and percentage of functional, daily activities.

A.D.L.	None	Mild	Moderate	Severe	Extreme
	Frequency	Frequency	Frequency	Frequency	Frequency
Descending stairs	1	5	15	26	6
Ascending stairs	1	5	15	22	7
Rising from sitting	1	5	22	22	2
Standing	0	8	21	19	2
Bending to floor	1	9	16	22	2
Walking on a flat surface	2	11	24	11	2
Getting in/out of the car	4	12	18	12	4
Going shopping	1	12	18	16	3
Putting up socks/stockings	0	10	19	16	5
Rising from bed	2	13	14	20	1
Taking off socks/stockings	0	11	19	14	6
Turning over on the bed	4	16	16	14	0
Getting in/out of the bath	0	10	13	20	7
Sitting	1	6	19	17	7
Getting on/off the toilet	0	8	15	20	7
Heavy domestic duties	10	9	14	12	5
Light domestic duties	8	13	16	10	3

Table 4: Frequencies and percentage of function, sports, and recreational activities.

Sports and recreational activities	None	Mild	Moderate	Severe	Extreme
	Frequency	Frequency	Frequency	Frequency	Frequency
Squatting	1	7	23	13	6
Running	2	9	19	18	2
Jumping	0	12	18	18	2
Twisting/pivoting	1	12	17	19	1
Kneeling	0	8	20	17	5

Table 5: Frequency and percentage of quality of life.

Quality of life	None	Mild	Moderate	Severe	Extreme
	Frequency	Frequency	Frequency	Frequency	Frequency
Aware of your knee problem	1	8	9	32	0
Modified your lifestyle	1	23	14	12	0
Troubled with a lack of confidence	0	24	16	10	0
Difficulty with your knee	0	11	19	16	4

DISCUSSION

Extensive research has been conducted to explore knee osteoarthritis prevalence among postmenopausal females. Using data from N.I.R.M., an observational study, we observed knee osteoarthritis among postmenopausal females older than 50. We found that females faced difficulties in their daily activities associated with pain and many symptoms, making their life difficult.

In our study of the prevalence of knee O.A. among postmenopausal females, we use a K.O.O.S. questionnaire consisting of 5 variables. Each variable has further questions asked to the participating females. These variables are symptoms (having 7 questions), pain (having 9 questions), functional and daily activities (having 17 questions), sport and recreational activities (having 5 questions), and quality of life (having 4 questions). We have frequencies and percentages of all 42 questions of 5 variables and their means. Using a demographic questionnaire, we have frequency and percentage of age, occupation, and B.M.I.

Out of 50 postmenopausal females, no participant was missing from the demographic questionnaire. We found that according to age between 50-55years, 24(48%) females, according to occupation, 45(90%) house wife's, and according to B.M.I., 20(40%) overweight.

Through the K.O.O.S. questionnaire, no participant was missing out of 50 postmenopausal females. We found that postmenopausal females sometimes have moderate symptoms of knee OA. 29 (58%) of females have severe daily pain. Functional and daily activities were affected moderately. Sports and recreational activities were also affected moderately.32 (64%) females found that their life was mildly affected by knee Osteoarthritis.

In 2006 Lix L et al. conducted a study on Defining and validating chronic diseases: an administrative data approach. Winnipeg: Manitoba Centre for Health Policy in Japan concluded that 30% radiographic knee OA and 21.2% symptomatic knee O.A. associated with high B.M.I., post-menopause, old age, and high BMD was significantly caused by knee osteoarthritis²².

In 2019 Jae Hyun Jung et al. concluded that osteoarthritis increments after Menopause. It might be expected hormonal changes in ladies of Korea. As per their review, Osteoarthritis happens because of Estrogen inadequacy. Menopausal chemical treatment (M.H.T.) was identified with the advancement of Osteoarthritis²³.

Xu Tang et al. in 2011-2012 led a longitudinal report to decide the commonness of indicative knee osteoarthritis in China 17,128 people were removed for this review from 17,128 members 8,367 ladies were experiencing knee osteoarthritis. Knee osteoarthritis was more normal in ladies of the country than in the metropolitan region. The pervasiveness of knee osteoarthritis was most elevated in ladies of the southwest district. It was presumed that the predominance of indicative knee osteoarthritis changed by socio-segment financial and geographic factors^{24,25}.

In 2019, Michael A. Clynes et al conducted a study on the Impact of Osteoarthritis on activities of daily living: does joint site matter? They concluded that O.A.is strongly related to the ability to undertake A.D.L.in older adults. Limitations in A.D.L.s and mobility vary according to siteand sex, and these differences should be considered in the clinical setting. These data support the requirement for functional assessment and corresponding interventions to prevent worsening functional decline in individuals with O.A.and the consequent health and social problems which would arise at great expense to the individual and society²⁶.

Another study conducted by F. Kooranian et al in 2023, according to which knee osteoarthritis is more common in women and can be resolved to some extent by massage of reassure points. During our study, we observe that, according to the results, women get relief from pain by taking a massage and with proper exercises because 58% of women have aim and difficulty²⁷.

A longitudinal study was conducted in 2004 by Wluka AE et al in Australia to find whether the amount of joint cartilage in healthy postmenopausal women changes with time. Secondly, whether Estrogen replacement therapy affects the health of joint cartilage or not. This study concludes that mean tibial cartilage loss in healthy postmenopausal women is 1.5-3.2 % a year²⁸.

A community-based cohort study conducted by Driban JB et al. in 2020 concluded that more than 1 out of 7 women with incident knee osteoarthritis had accelerated knee osteoarthritis, and the risk increased with age. Our study also shows an increased age relationship with knee osteoarthritis in women²⁹.

A cohort study was conducted in 2022 by Bevilacqua G et al. This study aimed to determine the relationship between Osteoarthritis and the ability toself-care among older adults. 433 men and women aged 75 were included in the study. Osteoarthritis was reported in 26.8% of participants. Joint pain, stiffness, and limitation in the movement arecommon among these patients. In our study of knee osteoarthritis among postmenopausal women 13 women out of 50 have morning stiffness and joint pain.26% of women show symptoms of morning stiffness and crepitus sound with movement³⁰.

In 2016 a study was conducted by Palazzo C et al., showing that Osteoarthritis is the leading cause of activity limitation, especially walking and its effects on the overall quality of life. Patient with Osteoarthritis is at greater risk of mortality and associated disability level. In our study, 38% of women have difficulty sitting, lying and attaining different positions dueto knee osteoarthritis³¹.

A cross-sectional study was conducted in 2015 by Lee S et al., including 9512 participants aged more than 50 years. According to this study, knee osteoarthritis prevalence among postmenopausal women was found to be 43.9%³².

CONCLUSIONS

The study concludes that postmenopausal females have knee osteoarthritis that produces symptoms with severe pain. Their

functional, daily, sports and recreational activities are moderately affected by the quality of life effects.

Recommendations: We encourage more researches to be carried out to investigate further effects of problems that are associated with knee osteoarthritis. We recommend exploring the effect of hormonal replacement therapy and estrogen therapy for the treatment purpose of Menopause. Furthermore, a large sample and different scales should be used for further consideration.

Conflict of interest: Nil

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