**A comparison of health-related quality of life of patients with knee**

**osteoarthritis in two urban cities in Pakistan**

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**Abstract:**

**Background**

Osteoarthritis is one of the major crippling disease that mostly affects hip and knee joints. Degenerative Osteoarthritis is the age related chronic disease of the joint cartilage. It is very common among elderly people and affecting populations worldwide. It has been the major cause of disability that affects health and activity of daily living. Mostly patients present with symptoms of stiffness and pain in the affected joints.

**Objective**

To compare heath related quality of life among the patients of knee osteoarthritis of two urban cities of Pakistan (Lahore and Sialkot).

**Method**

Cross sectional comparative study data collected from 158 patient (n=158) female and male with age limit between 40 years to onward according to inclusion criteria taken from Government and private hospital and clinics of Lahore and Sialkot. SF12 questionnaire used for collection and convenient sampling was used.

**Result**

In this study the sample size was evenly divide between Lahore and Sialkot. Lahore is a major urban center whereas Sialkot is an Industrial city and not as urbanized as Lahore. Studies have shown that lifestyle in major urban centers is more sedentary than smaller cities despite this no difference in result was seen among ADL’s of patients of Knee Osteoarthritis of both cities. 158 patients selected, out of which 53 were Male and 105 were female.

There is no significant difference in the health related quality of life between Sialkot and Lahore. The p value (0.57), calculated through independent sample t test shows that there is not any significant difference in the health related quality of life among both groups

**Conclusion**

The health related quality of life in patients of Knee OA from Lahore and Sialkot almost same and participants from both cities having same disability level of life and awareness regarding osteoarthritis.

**Key Words:** Osteoarthritis, Daily activity of livings ( DAL), Health related quality of life

**INTRODUCTION AND LITERATURE REVIEW**

**Introduction**

Osteoarthritis (OA) is the chronic disease of the joint in which bone and joint cartilage are breakdown.[[1](#_ENREF_1)] OA is the common type of joint disease in which elderly people are affected worldwide. In developing and developed country in which major cause of disability on health and activity of daily living. In which symptoms are included: stiffness, pain, debilitating and accounting significant disability, poor performance in physical and social task as well function level of the person also decrease. Problem in walking, squatting and stair climbing are common. The elder people who have diagnosed OA difficulty in his or her life they are used long term pharmacological medicine and physical therapy treatment.[[2](#_ENREF_2), [3](#_ENREF_3)]

The OA prevalence range between 10-20 % in elder population.it has more effect on women and elderly people as compare to men age between 45 to 65 years.[[4](#_ENREF_4)] In many study shows that the prevalence of OA is increasing day by day and some study also shows that OA of knee is higher than hip OA and this is more marked in people of Asian. In 2020 it could be 7th most prevalent disease. Some study describe that 23% pain increases of 55 years people and 39% of 65 years.[[5](#_ENREF_5)] Some study describe about the prevalence of OA 14.7% in women and 10.5% in men.[[6](#_ENREF_6)] another shows that OA of knee 11% in women and 7% in men and one study show that the incidence increase 40% in 2025.[[7-9](#_ENREF_7)]

The major causes of knee OA young population age between 25-35 years are knee trauma. Poor nutrition, prolonged knee bending and the ligamentous injury are the major cause of knee OA. Obesity is the major cause of bilateral knee OA [[10-12](#_ENREF_10)]

Health related quality of life improve the patient by better assessment early diagnosis of OA. [[13](#_ENREF_13)] physical activity improve the quality of life in the patient of knee OA regular exercises decrease the risk of many disease like diabetes, osteoporosis, hypertension, obesity and key role of manage the knee arthritis, maintaining regular basis exercises is challenge for patient of OA. Early diagnose of arthritis also control the disease better as compare to later stage of the disease. Patient education and behavior intervention is great help to decrease the progression of the arthritis.[[14-17](#_ENREF_14)].

The objective of our study was to compare the heath related quality of life in the patients of knee osteoarthritis between Lahore and Sialkot. The rationale of our study is that degenerative joint disease is very commonly affect weight bearing joints specially knee joint which disturbs the quality of life of the patients due to lack of awareness about the disease process and modification of life styles. So this study will help to educate general population about knee osteoarthritis and in this way to improve the quality of life. The null hypothesis was that there was no difference between the quality of life in patients of knee OA and alternative hypothesis was that there was difference between the quality of life in patients of knee OA in Sialkot and Lahore

**Literature Review**

Fausto Salaffi 2005 et al conducted cross sectional study in which they assess the quality of life patient of knee osteoarthritis and elder population in this study they used the questionnaire of WOMAC and SF-36. They took 244 patient (145 female and 99 male) age more than 50 years. They concluded that the difficulty in health related quality of life linked with radiographic changes.[[18](#_ENREF_18)]. A study conducted in 2009 by Azman A Baker et al in which they investigate quality of life among knee O.A patients in primary care clinics. They took 151 patient ages between 65-75 years. They used the questionnaire of SF-36(SF-12 is the short form of SF-36). The cross sectional study show that O.A patient who attend in primary care clinics had poor quality of life affecting activity of daily living and less impact on mental health.[[2](#_ENREF_2)]. A cohort study conducted by Jones CA, et al 2000 in which they took 276 patient with severe knee O.A and 228 of hip O.A after one month of knee and hip replacement they used WOMAC questionnaire for measure the pain and stiffness. This study shows that the pain and stiffness of the knee and hip were reduced and improvement occurred in the quality of life after the joint replacement. [[19](#_ENREF_19)]. [Jack Farr II](https://www.ncbi.nlm.nih.gov/pubmed/?term=Farr%20II%20J%5BAuthor%5D&cauthor=true&cauthor_uid=24285987), et al in 2013 conducted the study in which they assess the quality of life in O.A patients. This cross sectional studies concluded that better treatment and exercise improve the patient social, physical and psychological status.[[8](#_ENREF_8)]. Luis Andrade Araujo, et al conducted Cross sectional analytic study concluded that Functional independence positively affects quality of life. Higher the functional independence and higher will be the quality Of life. [[9](#_ENREF_9)] YA Murillo et al conducted the comparative cross sectional study in which they compare the osteoarthritis and comorbidity like diabetes, hypertension and end stage of renal condition with health and concluded that osteoarthritis need more consideration than other comorbidities.[20]. Another study shows that the anatomy of the joint is disturb. It is progressive disease it worsens in later stage and has no cure.[[21](#_ENREF_21)]. Randomized control trail study conducted by M Nunez et al in 2006 in which the diagnosed patient of osteoarthritis( waiting for replacement of joint) divided into two group, one group received both pharmacological and  therapeutic education and functional re adaptation (TEFR) and one group received the pharmacological treatment only. They concluded that negative impact of osteoarthritis is much reduced in the former group.[[22](#_ENREF_22)]

According to literature review it is obvious that OA of knee joints really affects the quality of life and those patients who live in urban cities and well aware about disease process are having good health related activities levels. In our study we compare two urban cities with one more urbanized, but results were same, that means we really need awareness in urban city of developing countries about osteoarthritis, to improve quality of health related activity.

1. **METHODOLOGY**

**STUDY DESIGN** Comparative cross-sectionalstudy

**STUDY AREA:**  Lahore is second populus city of Pakistan with population of 11126285 and Sialkot is 13th populous city with population of 655852 according to census 2017. Lahore is more urbanized. Prevalance of Osteoarthritis is 28% in urban and 25% in rural areas of Pakistan. Following centers selected for study.

Government Sardar Baigum Hospital Sialkot. Govt Khawaja Safdar Hospital Sialkot and Chauhdry Mohammed Akram teaching and research Hospital Lahore and Saeed Orthopedic and medical center Lahore.

**STUDY DURATION:** Study was completed in 6 months duration from Nov 2018 to April 2019 .

**SAPLE SIZE:**

158 patients selected, out of which 53 were Male and 105 were female

**SAMPLING TECHNIQUE:** Data was calculated by using convenience sampling method.

**ELIGIBILITY CRITERIA:**

1. **INCLUSION CRITERIA:**

Diagnosed patient of knee O.A with grade 3 and 4.

Age between 40 yrs and 80 yrs

1. **EXCLUSION CRITERIA:**

Any history of systemic disorder e.g. Rhumatoid Arthritis, Ankylosing spondylitis

History of any Malignancy

History of Trauma

History of any previous knee surgery

Congenital musculoskeletal deformity e.g. scoliosis, kyphosis,

**DATA COLLECTION TOOL:**

SF-12 questionnaire

**DATA COLLECTION PROCEDURE**:

A comparative cross-sectional study in which olderage female and male with age limit between 40 years to onward according to inclusion criteria taken from Government and private hospital and clinics of Lahore and Sialkot. Convenient sampling was used. The identity of the researcher kept anonymous. All measures collected during a single session. After taking informed consent patients were requested to fill questionnaire. Health related SF-12 V2 questionnaire was used for health related quality of life measure.

**STATISTICAL PROCEDURE:**

SPSS 12 used for data analysis

Chi square test for result

Sample t test

**OPERATIONAL DEFINITION:**

**SF-12V2** questionnaire contain 12 item of question include the 4 points (general health, mental stress, disturbance in activity of daily living and social activity) SF-12 v2 is the short form of SF-36 questionnaire. Questionnaire scoring individual by using the formula

Transformation of score = Actual raw score – lowest possible raw score \* 100

**/** Possible raw score

Validity/reliability of SF-12v2 is **0.93–0.96**

**ETHICAL ISSUE**

After permission from authorities of the hospitals and departments

With Consent form signed ensuring privacy of participants.

During the study period ethics were kept in consideration.

**Result**

A total of 158 patients with knee OA participated in the study. Out of total 53 were males and 105 were females. Participants were equally selected from Lahore and Sialkot (79 from each city). The mean age of the participants was 48.53 as shown in table 1 and 2.

Table 1 Socio-demographic Profile (Qualitative Variables)

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | | **Frequency** | **Percentage** |
| **Gender** | **Male** | 53 | 33.5 |
| **Female** | 105 | 66.5 |
| **City** | **Lahore** | 79 | 50.0 |
| **Sialkot** | 79 | 50.0 |

Table 2 Socio-demographic Profile (Quantitative Variables)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age** | **Minimum** | **Maximum** | **Mean** | **SD** |
| 41.00 | 80.00 | 48.53 | 10.36 |

**SF-12V2** questionnaire contain 12 item of questions covering 4 points (general health, mental stress, disturbance in activity of daily living and social activity) filled that are shown in tables 3, 4 and 5.

Table 3 Comparison of responses about general health

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **General**  **Health** | **In general, would you say your health is** | | | | | **p-value** |
| **Excellent** | **Very good** | **Good** | **Fair** | **Poor** |
| **Lahore n=79** | 6(7.6%) | 12(15.2%) | 26(32.9%) | 26(32.9%) | 9(11.4%) | 0.57 |
| **Sialkot n=79** | 3(3.8%) | 10(12.7%) | 23(29.1%) | 28(35.4%) | 15(19%) |
| **Total n=158** | 9(5.7%) | 22(13.9%) | 49(31%) | 54(34.2%) | 24(15.2%) |

Table 4 Comparison of responses about activities of daily livings

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ADLs** | **Limited A lot** | **Limited A Little** | **Not Limited** | **p-value** |
| **Limitation in moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf** | | | | |
| **Lahore n=79** | 24(30.4%) | 43(54.4%) | 12(15.2%) | 0.53 |
| **Sialkot n=79** | 22(27.8%) | 49(62%) | 8(10.1%) |
| **Total n=158** | 46(29.1%) | 92(58.2%) | 20(12.7%) |
| **Limitation in climbing several flights of stairs** | | | | |
| **Lahore n=79** | 24(30.4%) | 37(46.8%) | 18(22.8%) | 0.58 |
| **Sialkot n=79** | 32(40.5%) | 39(49.4%) | 8(10.1%) |
| **Total n=158** | 56(35.4%) | 76(48.1%) | 26(16.5%) |

Table 5 Comparison of responses about mental stress and Social Activity

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Mental Stress and Social Activity** | **All of the time** | **Most of the time** | **Some of the time** | **A little of the time** | **None of the time** |  |
| **During the past 4 weeks, Do you accomplished less than you would like due to physical health?** | | | | | | |
| **Lahore n=79** | 9(11.4%) | 32(40.5%) | 29(36.7%) | 6(7.6%) | 3(3.8%) | 0.48 |
| **Sialkot n=79** | 9(11.4%) | 30(38%) | 34(43%) | 6(7.6%) | 0(0%) |
| **Total n=158** | 18(11.4%) | 62(39.2%) | 63(39.9%) | 12(7.6%) | 3(1.9%) |
| **During the past 4 weeks, Were you limited in the kind of work or other activities due to physical health?** | | | | | | |
| **Lahore n=79** | 10(12.7%) | 27(34.2%) | 26(32.9%) | 11(13.9%) | 5(6.3%) | 0.11 |
| **Sialkot n=79** | 5(6.3%) | 39(49.4%) | 27(34.2%) | 7(8.9%) | 1(1.3%) |
| **Total n=158** | 15(9.5%) | 66(41.8%) | 53(33.5%) | 18(11.4%) | 6(3.8%) |
| **During the past 4 weeks, Do you accomplished less than you would like due to emotional problem?** | | | | | | |
| **Lahore n=79** | 12(15.2%) | 29(36.7%) | 23(29.1%) | 14(17.7%) | 1(1.3%) | 0.86 |
| **Sialkot n=79** | 9(11.4%) | 30(38%) | 28(35.4%) | 11(13.9%) | 1(1.3%) |
| **Total n=158** | 21(13.3%) | 59(37.3%) | 51(32.3%) | 25(15.8%) | 2(1.3%) |
| **During the past 4 weeks, Did your work or activity less carefully due to emotional problem?** | | | | | | |
| **Lahore n=79** | 10(12.7%) | 25(31.6%) | 28(35.4%) | 15(19%) | 1(1.3%) | 0.19 |
| **Sialkot n=79** | 8(10.1%) | 39(49.4%) | 21(26.6%) | 9(11.4%) | 2(2.5%) |
| **Total n=158** | 18(11.4%) | 64(40.5%) | 49(31%) | 24(15.2%) | 3(1.9%) |
| **During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework?** | | | | | | |
| **Lahore n=79** | 5(6.3%) | 13(16.5%) | 37(46.8%) | 10(12.7%) | 14(17.7%) | 0.11 |
| **Sialkot n=79** | 7(8.9%) | 19(24.1%) | 21(26.6%) | 17(21.5%) | 15(19%) |
| **Total n=158** | 12(7.6%) | 32(20.3%) | 58(36.7%) | 27(17.1%) | 29(18.4%) |
| During the past 4 weeks, Have you felt calm and peaceful? | | | | | | |
| **Lahore n=79** | 6(7.6%) | 19(24.1%) | 31(39.2%) | 21(26.6%) | 2(2.5%) | 0.18 |
| **Sialkot n=79** | 2(2.5%) | 16(20.3%) | 30(38%) | 31(39.2%) | 0(0%) |
| **Total n=158** | 8(5.1%) | 35(22.2%) | 61(38.6%) | 52(32.9%) | 2(1.3%) |
| During the past 4 weeks, Did you have a lot of energy?? | | | | | | |
| **Lahore n=79** | 6(7.6%) | 17(21.5%) | 26(32.9%) | 24(30.4%) | 6(7.6%) | 0.43 |
| **Sialkot n=79** | 2(2.5%) | 14(17.7%) | 27(34.2%) | 32(40.5%) | 4(5.1%) |
| **Total n=158** | 8(5.1%) | 31(19.6%) | 53(33.5%) | 56(35.4%) | 10(6.3%) |
| During the past 4 weeks, Have you felt downhearted and depressed? | | | | | | |
| **Lahore n=79** | 8(10.1%) | 22(27.8%) | 24(30.4%) | 15(19%) | 10(12.7%) | 0.83 |
| **Sialkot n=79** | 11(13.9%) | 26(32.9%) | 26(32.9%) | 15(19%) | 1(1.3%) |
| **Total n=158** | 19(12%) | 48(30.4%) | 50(31.6%) | 30(19%) | 11(7%) |
| During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities? | | | | | | |
| **Lahore n=79** | 14(17.7%) | 21(26.6%) | 29(36.7%) | 11(13.9%) | 4(5.1%) | 0.83 |
| **Sialkot n=79** | 13(16.5%) | 24(30.4%) | 26(32.9%) | 14(17.7%) | 2(2.5%) |
| **Total n=158** | 27(17.1%) | 45(28.5%) | 55(34.8%) | 25(15.8%) | 6(3.8%) |

Table 6 Comparison of Health Related Quality

|  |  |  |  |
| --- | --- | --- | --- |
| **Health Related  Quality** | **Lahore** | **Sialkot** | **p-value** |
| **SF-12 Scale Score** | 32.29±4.97 | 31.89±4.6 | 0.57 |

Table 6 is comparing the score of health related quality SF-12 Scale score among participants. The mean score of participants from Lahore was 32.29±4.97 and from Sialkot was 31.89±4.6. The p value (0.57), calculated through independent sample t test shows that there is no significant difference in the health related quality of life among both groups.

All above data shows that health related quality of life in patients of Knee OA from Lahore and Sialkot almost same and participants from both cities having same disability level in performing activity of daily livings and moreover having same level of awareness regarding osteoarthritis. P value of less than 0.05 was considered as significant

1. **Discussion**:

This study aimed to measure health related quality of life in the patient of knee osteoarthritis help the care provider or physical therapist to understand the impact of the disease.

In this study the sample size was evenly divide between Lahore and Sialkot. Lahore is a major urban center whereas Sialkot is an Industrial city and not as urbanized as Lahore. Studies have shown that lifestyle in major urban centers is more sedentary than smaller cities despite this no difference in result was seen among ADL’s of patients of Knee Osteoarthritis of both cities.

Among participants there were a number of patients that had severe Osteoarthritis and fulfilled the criteria for Knee replacement, which has been established as the most effective treatment for Knee Osteoarthritis. But our society did not have money for operation.[[23](#_ENREF_23)]

This study showed that decrease social activity of knee osteoarthritis and previous study also support the result. A study conducted in September 2016 showed decreased ADL’s like stair climbing, in this study 83.5% of patients responded that they had severe or some limitation to climbing stairs, house hold work. In this study 76% of patients of Osteoarthritis feel most of the time depressed or some of the time whereas 26% felt Little to no depression. These result are in line with other studies conducted on patients of Knee Osteoarthritis which showed high percentage of levels of depression the patients of Knee Osteoarthritis.[[24-26](#_ENREF_24)]

The osteoarthritis is the degenerative disease which can affect every old age population. This study shows most limitation in ADL’s of patients suffering from knee osteoarthritis. Most severe limitations were seen in stairs climbing moderate activities such as cleaning the house. This study also showed a significant number of patients due to limitation on ADL also suffered from depression. These patients should be provided the resources to identify and address their concerns. Support groups Rehabilitation physical therapy to cop this situation. The anxiety and pain can depress the patient of knee osteoarthritis.[[27](#_ENREF_27)]

An Orthopaedic surgeon and Physiotherapist can help to improve ADLs of the patient of knee osteoarthritis, pain and swelling can be managed with modification of life styles, medications and physical therapy. All these decrease the impact of disease. Physical therapy can improve the living style; improve quality of life and social behavior.

**Limitation**

Time may be short for study.

Patients reluctant to give data.

Male and female ratio was not same

**Conclusion:**

This study concludes that there is no difference in the health related quality of life in patients of Knee OA from Lahore and Sialkot and participants from both cities were having same health related quality of life.

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**RECOMMENDATION**

We recommend this kind of study should be further conducted in other different cities and may be on international level to compare health related qualities of OA knee patients in different cities of same country and also comparing different countries.

Counseling for better compliances and Education about arthritis

Early consultation of Orthopedic surgeon and physical therapy

Counseling of patients to relief depression due to Osteoarthritis and spend better quality of life.

All above especially important in less urbanized and developing cities/countries.

**DECLARATIONS**

We acknowledge this study to our parents and teachers.

The contribution from both authors almost same.

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There is neither any conflict of interest nor any ethical issue.

Informed consent taken from all participants and data collected on performa. Identity kept secret.

**REFERENCES:**

1. Petkovic, J., et al., *Toward ensuring health equity: readability and cultural equivalence of OMERACT patient-reported outcome measures.* The Journal of rheumatology, 2015: p. jrheum. 141168.

2. Zakaria, Z.F., et al., *Health-related quality of life in patients with knee osteoarthritis attending two primary care clinics in Malaysia: a cross-sectional study.* Asia Pacific family medicine, 2009. **8**(1): p. 10.

3. Hassanein, M., M. Shamssain, and N. Hassan, *Health Related Quality of Life among Osteoarthritis Patients: A Comparison of Traditional Non-Steroidal Anti-Inflammatory Drugs and Selective COX-2 Inhibitors in the United Arab Emirates Using the SF-36.* Pharmacology & Pharmacy, 2015. **6**(04): p. 232.

4. Jordan, J.M., et al., *Prevalence of knee symptoms and radiographic and symptomatic knee osteoarthritis in African Americans and Caucasians: the Johnston County Osteoarthritis Project.* The Journal of rheumatology, 2007. **34**(1): p. 172-180.

5. Zakaria, Z.F., et al., *Health-related quality of life in patients with knee osteoarthritis attending two primary care clinics in Malaysia: a cross-sectional study.* Asia Pac Fam Med, 2009. **8**(1): p. 10.

6. Grotle, M., et al., *Prevalence and burden of osteoarthritis: results from a population survey in Norway.* The Journal of Rheumatology, 2008. **35**(4): p. 677-684.

7. Felson, D.T., et al., *The prevalence of knee osteoarthritis in the elderly. The Framingham Osteoarthritis Study.* Arthritis & Rheumatology, 1987. **30**(8): p. 914-918.

8. Jack Farr, I., L.E. Miller, and J.E. Block, *Quality of life in patients with knee osteoarthritis: a commentary on nonsurgical and surgical treatments.* The open orthopaedics journal, 2013. **7**: p. 619.

9. Araujo, I.L.A., et al., *Quality of life and functional independence in patients with osteoarthritis of the knee.* Knee surgery & related research, 2016. **28**(3): p. 219.

10. Roos, E.M., *Joint injury causes knee osteoarthritis in young adults.* Current Opinion in Rheumatology, 2005. **17**(2): p. 195-200.

11. Andriacchi, T.P. and A. Mündermann, *The role of ambulatory mechanics in the initiation and progression of knee osteoarthritis.* Current Opinion in Rheumatology, 2006. **18**(5): p. 514-518.

12. Anderson, J.J. and D.T. Felson, *FACTORS ASSOCIATED WITH OSTEOARTHRITIS OF THE KNEE IN THE FIRST NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (HANES I)EVIDENCE FOR AN ASSOCIATION WITH OVERWEIGHT, RACE, AND PHYSICAL DEMANDS OF WORK.* American Journal of Epidemiology, 1988. **128**(1): p. 179-189.

13. Salaffi, F., M. Carotti, and W. Grassi, *Health-related quality of life in patients with hip or knee osteoarthritis: comparison of generic and disease-specific instruments.* Clin Rheumatol, 2005. **24**(1): p. 29-37.

14. de Jong, O.R.W., et al., *An implementation study of two evidence‐based exercise and health education programmes for older adults with osteoarthritis of the knee and hip.* Health Education Research, 2004. **19**(3): p. 316-325.

15. Brosseau, L., et al., *The implementation of a community-based aerobic walking program for mild to moderate knee osteoarthritis: a knowledge translation randomized controlled trial: part II: clinical outcomes.* BMC Public Health, 2012. **12**(1): p. 1073.

16. De Jong, O., et al., *An implementation study of two evidence‐based exercise and health education programmes for older adults with osteoarthritis of the knee and hip.* Health education research, 2004. **19**(3): p. 316-325.

17. Kanavaki, A.M., et al., *Barriers and facilitators of physical activity in knee and hip osteoarthritis: a systematic review of qualitative evidence.* BMJ Open, 2017. **7**(12): p. e017042.

18. Salaffi, F., M. Carotti, and W. Grassi, *Health-related quality of life in patients with hip or knee osteoarthritis: comparison of generic and disease-specific instruments.* Clinical Rheumatology, 2005. **24**(1): p. 29-37.

19. Jones, C.A., et al., *Health related quality of life outcomes after total hip and knee arthroplasties in a community based population.* The Journal of rheumatology, 2000. **27**(7): p. 1745-1752.

20. Murillo, Y.A., et al., *Health related quality of life in rheumatoid arthritis, osteoarthritis, diabetes mellitus, end stage renal disease and geriatric subjects. experience from a General Hospital in Mexico.* Reumatología Clínica (English Edition), 2015. **11**(2): p. 68-72.

21. Nunez, M., et al., *Health-related quality of life and costs in patients with osteoarthritis on waiting list for total knee replacement.* Osteoarthritis and cartilage, 2007. **15**(3): p. 258-265.

22. Nunez, M., et al., *The effect of an educational program to improve health-related quality of life in patients with osteoarthritis on waiting list for total knee replacement: a randomized study.* Osteoarthritis and cartilage, 2006. **14**(3): p. 279-285.

23. Fransen, M., et al., *The epidemiology of osteoarthritis in Asia.* International journal of rheumatic diseases, 2011. **14**(2): p. 113-121.

24. Vaughan, M.W., et al., *Perceived Community Environmental Factors and Risk of Five‐Year Participation Restriction Among Older Adults With or at Risk of Knee Osteoarthritis.* Arthritis care & research, 2017. **69**(7): p. 952-958.

25. Fukutani, N., et al., *Knee pain during activities of daily living and its relationship with physical activity in patients with early and severe knee osteoarthritis.* Clinical rheumatology, 2016. **35**(9): p. 2307-2316.

26. Sherman, A.M., *Social relations and depressive symptoms in older adults with knee osteoarthritis.* Social science & medicine, 2003. **56**(2): p. 247-257.

27. Abbasnia, V.S., *The Effect of Citrus Aurantium Flowers Aqueous Extract on Sleeping Time and the Level of Anxiety in mice.* Journal of Birjand University of Medical Sciences, 2016. **23**(4): p. 307-314.

1. **APPENDIX**

**CONSENT FORM:**

Respected participant, the study you are going to participate is “female and male with and without osteoarthritis” Please give approval of your participation by filling the following form.

* I confirm that I have read and understand the information for the study.
* I understand that taking part is voluntary that I am free to withdraw any time, without giving any reason.
* I agree to take part in this study and researcher having the following personal detail for the purpose of contacting me directly to arrange a research interview.

Name; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Gender; \_\_\_\_\_\_\_ Age; \_\_\_\_\_\_\_ Date; \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone no; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hospital name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_