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# A comparison of health-related quality of life among knee osteoarthritis patients in two cities in Pakistan

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## Abstract

**Background:** Osteoarthritis (OA) is a major cause of disability that impacts health and activities of daily living, mostly affecting the hip and knee joints. Patients commonly present with symptoms of stiffness and pain in the affected joints. As an age-related chronic disease of the joint cartilage, degenerative osteoarthritis is very common among elderly people worldwide.

**Objective:** To compare health-related quality of life among patients with knee osteoarthritis in two cities in Pakistan: Lahore and Sialkot.

**Methods:** In a cross-sectional comparative study, data were collected from patients (N = 158; 105 female; 53 male) aged 40 years or older, based on inclusion criteria adopted from government and private hospitals and clinics in Lahore and Sialkot and using the SF12 questionnaire and convenience sampling. The sample was evenly divided between the two cities.

**Results:** Earlier studies have shown that lifestyle in major urban centers is more sedentary than in smaller cities. However, independent sample t-testing ( $p = 0.57$ ) revealed no significant difference in health-related quality of life between knee osteoarthritis patients in Lahore (a major urban center) and Sialkot (which is less urbanized).

**Conclusion:** Health-related quality of life in knee OA patients in Lahore and Sialkot was effectively the same in terms of disability level and awareness.

**Keywords:** osteoarthritis; activities of daily living; health-related quality of life

## INTRODUCTION

Osteoarthritis (OA) is a chronic disease of the joint, in which bone and joint cartilage break down [1]. OA is the most common type of joint disease among elderly people worldwide in both developing and developed countries, with significant consequences for health and activities of daily living (ADL). Symptoms include stiffness, pain, debilitating and significant disability, and poor performance of physical and social tasks, impacting the individual's general health and causing difficulty in walking, squatting, and stair climbing. Older people who have been diagnosed with OA are also likely to be long-term users of medication and physical therapy [2,3]. There is evidence that the prevalence of OA continues to increase, affecting 10–20% of the elder population, and it is likely to be the seventh most common disease by 2020. The condition is more prevalent among wom-

en and elderly people than among men aged 45–65 [4]. Other evidence suggests that knee OA is more common than hip OA, notably among people of Asian origin; that pain increases by 23% after the age of 55 and by 39% after the age of 65 years [2]. In general, OA is thought to affect 14.7% of women and 10.5% of men [5]; OA of the knee affects 11% of women and 7% of men, and a 40% increase in incidence is forecast by 2025 [6–8]. Among younger people aged 25–35, the main causes of knee OA are trauma, poor nutrition, prolonged knee bending, and ligamentous injury while obesity is the major cause of bilateral knee OA [9–11].

Health-related quality of life is improved by better assessment and early diagnosis of OA [12]. Physical activity improves quality of life among knee OA patients, and regular exercise reduces the risk of diseases such as diabetes, osteoporosis, hypertension, and obesity. As a key element in managing knee OA, maintaining regular exercise is challenging for these patients. Early diagnosis helps to control the disease more effectively, and patient education and behavior intervention is of great help in slowing its progression [13–15].

The objective of the present study was to compare health-related quality of life among knee OA patients

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Received: 23 August 2019 Accepted: 29 October 2019

in Lahore and Sialkot. Degenerative joint disease commonly affects weight-bearing joints, especially the knee joints, and the patient's quality of life is further undermined by a lack of understanding of the disease and the need for lifestyle modification. The study rationale is that these patients' quality of life can be enhanced by educating the general population about knee OA. The null hypothesis was that there is no difference in quality of life among patients of knee OA; the alternative hypothesis was that there is a difference in the quality of life of knee OA patients in Sialkot and Lahore.

### Literature Review

One cross-sectional study [12] assessed quality of life among knee OA patients and the elder population using the WOMAC and SF-36 questionnaires. Based on a sample of 244 patients (145 female, 99 male) aged more than 50 years, they concluded that health-related quality of life issues were linked to radiographic changes [12]. Another study used the SF-36 questionnaire to investigate quality of life among 151 knee OA patients aged 65–75 years in primary care clinics [2]. The cross sectional study revealed that OA patients who attend primary care clinics had poor quality of life due to OA with positive affects on ADL and mental health [2]. Another cohort study of 276 patients with severe knee OA and 228 patients with hip OA used the WOMAC questionnaire to measure pain and stiffness one month after knee and hip replacement procedures [16]. The findings indicated that pain and stiffness of the knee and hip were reduced following joint replacement, and that quality of life improved. Another cross-sectional study assessing quality of life in OA patients concluded that better treatment and exercise improve patients' social, physical, and psychological status [7]. Araujo et al.'s cross-sectional analysis [8] concluded that functional independence positively affects quality of life. In their comparative cross-sectional study, Murillo et al. investigated how osteoarthritis and comorbidities including diabetes, hypertension, and end-stage renal conditions affected health and concluded that osteoarthritis requires greater consideration [17]. Another study confirmed that joint anatomy is disrupted as the disease progresses, and that there is no cure [17]. In one randomized control trial [18], patients diagnosed with osteoarthritis and waiting for joint replacement were divided into two groups—one receiving both pharmacological treatment and therapeutic education on functional readaptation (TEFR), and the other receiving only pharmacological treatment. The findings indicated that the negative impact of osteoarthritis was substantially reduced in the former group.

It seems clear from the literature review that OA of the knee joint impacts significantly on quality of life, and that patients in urban areas and those who understand

the disease process exhibit good health-related activity levels. In the present study, the finding that results were the same in two urban areas (one more urbanized) indicates that greater awareness of osteoarthritis is needed in developing countries to improve health-related quality of life.

## METHODOLOGY

### Study Design

Comparative cross-sectional study.

### Study Area

Lahore (population 11,126,285) is Pakistan's second largest city and is more urbanized than Sialkot, the country's thirteenth largest city, which has a population of 655,852 (based on 2017 census figures). The prevalence of OA in urban areas of Pakistan is 28%; in rural areas, it is 25%. The centers selected for the purposes of this study were the Government Sardar Baigum Hospital, Sialkot; the Government Khawaja Safdar Hospital, Sialkot; the Chauhdry Mohammed Akram Teaching and Research Hospital, Lahore; and the Saeed Orthopedic and Medical Center, Lahore.

### Study Duration

The study was completed during the six-month period from November 2018 to April 2019.

### Sample Size

Of the 158 participating patients, 53 were male and 105 were female.

### Sampling Technique

Data were collected using convenience sampling.

### Eligibility Criteria

#### a. Inclusion criteria:

Diagnosis of knee OA (grade 3 or 4);  
Age 40–80 yrs.

#### b. Exclusion criteria:

Any history of systemic disorder (e.g., rheumatoid arthritis, ankylosing spondylitis);  
Any history of malignancy;  
History of trauma;  
Previous knee surgery;  
Congenital musculoskeletal deformity (e.g., scoliosis, kyphosis).

### Data Collection Tool

BSF-12 questionnaire.

### Data Collection Procedure

Comparative cross-sectional study, using convenience sampling to recruit older patients according to the in-

**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

clusion criteria of participating Government and private hospitals and clinics in Lahore and Sialkot. The researcher remained anonymous, and all data were collected in a single session. After giving informed consent, patients were asked to complete the SF-12 V2 questionnaire to measure health-related quality of life.

**Statistical Procedure**

SPSS 12 was used for data analysis, based on chi square and independent sample t-tests.

**Operational Definition**

The 12 items of the SF-12V2 questionnaire address four issues: general health, mental stress, disturbance of ADL, and social activity. (SF-12 v2 is the short form of SF-36.) Individual scoring is based on the following 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 Issues**

Permission secured from hospital authorities and departments.  
 Consent form ensuring participants’ privacy.  
 Ethical standards maintained throughout.

**RESULTS**

Of 158 knee OA patients who participated in the study (53 male and 105 female), participants were drawn equally from Lahore and Sialkot (79 from each city), with a mean age of 48.53 years (Tables 1 and 2).

Tables 3, 4 and 5 summarize responses to the SF-12V2 questionnaire.

Table 6 compares participants’ health-related quality of life in the two cities as measured by SF-12. The mean scores were 32.29±4.97 (Lahore) and 31.89±4.6 (Sialkot). Based on the independent sample t-tests, the p-value of 0.57 indicates that there is no significant difference between these two groups in terms of health-related quality of life. According to these results, participants from both cities experienced the same disability level in terms of ADL and exhibited the same level of awareness regarding osteoarthritis. (A p-value of less than 0.05 would be considered significant.)

**DISCUSSION**

The aim of this study was to measure health-related quality of life among knee OA patients in order to help care providers and physical therapists to understand the impact of the disease. The sample was evenly divided

**Table 3.** SF-12V2 responses: 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.** SF-12V2 responses: Activities of daily living

ADL	Limited a lot	Limited a little	Not limited	p-value
Limitations in moderate activities (e.g., moving a table, pushing a vacuum cleaner, bowling, 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%)	
Limitations 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.** SF-12V2 responses: Mental stress and social activity

<b>Mental Stress and Social Activity</b>	<b>All of the time</b>	<b>Most of the time</b>	<b>Some of the time</b>	<b>A little of the time</b>	<b>None of the time</b>	
During the past 4 weeks, have you accomplished less than you would like due to physical health issues?						
Lahore n = 79	9(11.4%)	32(40.5%)	29(36.7%)	6(7.6%)	3(3.8%)	
Sialkot n = 79	9(11.4%)	30(38%)	34(43%)	6(7.6%)	0(0%)	0.48
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 work or other activities due to physical health issues?						
Lahore n = 79	10(12.7%)	27(34.2%)	26(32.9%)	11(13.9%)	5(6.3%)	
Sialkot n = 79	5(6.3%)	39(49.4%)	27(34.2%)	7(8.9%)	1(1.3%)	0.11
Total n = 158	15(9.5%)	66(41.8%)	53(33.5%)	18(11.4%)	6(3.8%)	
During the past 4 weeks, have you accomplished less than you would like due to emotional problems?						
Lahore n = 79	12(15.2%)	29(36.7%)	23(29.1%)	14(17.7%)	1(1.3%)	
Sialkot n = 79	9(11.4%)	30(38%)	28(35.4%)	11(13.9%)	1(1.3%)	0.86
Total n = 158	21(13.3%)	59(37.3%)	51(32.3%)	25(15.8%)	2(1.3%)	
During the past 4 weeks, were you less careful in your work or other activities due to emotional problems?						
Lahore n = 79	10(12.7%)	25(31.6%)	28(35.4%)	15(19%)	1(1.3%)	
Sialkot n = 79	8(10.1%)	39(49.4%)	21(26.6%)	9(11.4%)	2(2.5%)	0.19
Total n = 158	18(11.4%)	64(40.5%)	49(31%)	24(15.2%)	3(1.9%)	
During the past 4 weeks, to what extent did pain interfere with your normal work (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%)	
Sialkot n = 79	7(8.9%)	19(24.1%)	21(26.6%)	17(21.5%)	15(19%)	0.11
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%)	
Sialkot n = 79	2(2.5%)	16(20.3%)	30(38%)	31(39.2%)	0(0%)	0.18
Total n = 158	8(5.1%)	35(22.2%)	61(38.6%)	52(32.9%)	2(1.3%)	
During the past 4 weeks, have you had a lot of energy?						
Lahore n = 79	6(7.6%)	17(21.5%)	26(32.9%)	24(30.4%)	6(7.6%)	
Sialkot n = 79	2(2.5%)	14(17.7%)	27(34.2%)	32(40.5%)	4(5.1%)	0.43
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%)	
Sialkot n = 79	11(13.9%)	26(32.9%)	26(32.9%)	15(19%)	1(1.3%)	0.83
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%)	
Sialkot n = 79	13(16.5%)	24(30.4%)	26(32.9%)	14(17.7%)	2(2.5%)	0.83
Total n = 158	27(17.1%)	45(28.5%)	55(34.8%)	25(15.8%)	6(3.8%)	

between Lahore and Sialkot; the former is a major urban center while the latter is less urbanized. Although

**Table 6.** Comparison of health-related quality of life in Lahore and Sialkot

	Lahore	Sialkot
SF-12 Scale Score	32.29±4.97	31.89±4.6

previous studies have found that lifestyle in major urban centers is more sedentary than in smaller cities, there was no significant difference between patients in these two cities in relation to ADL.

The participants included a number of patients with severe OA who met the criteria for knee replacement. This has been identified as the most effective treatment for knee OA, but the available financial resources are insufficient<sup>[20]</sup>.

The present findings align with previous evidence that knee OA reduces social activity. An earlier study<sup>[21]</sup> found that 83.5% of patients indicated severe or some limitation when climbing stairs and during housework. In another study, 76% of OA patients felt depressed most or some of the time while 26% felt little or no depression. These results align with other evidence of high levels of depression among knee OA patients<sup>[21-23]</sup>.

Osteoarthritis is a degenerative disease that affects older populations everywhere. The present findings indicate that knee OA patients experience the greatest limitations in ADL, especially in relation to stair climbing and moderate activities such as cleaning the house. The study also confirms that a significant number of patients who experience these limitations also suffer from depression. These patients should be provided with the necessary resources to identify and address their concerns, including support groups and rehabilitative physical therapy, as their anxiety and pain can lead to depression<sup>[23]</sup>.

Orthopedic surgeons and physiotherapists can help to improve ADL among knee OA patients. Pain and swelling can be managed through lifestyle modification, medication, and physical therapy, all of which can reduce the impact of disease and so improve quality of life and social behavior.

### STUDY LIMITATIONS

The study period was relatively short.  
Patients were reluctant to provide data.  
The male-female ratio was not balanced.

### CONCLUSION

We conclude that there is no difference in health-related quality of life among OA patients from Lahore and Sialkot.

### RECOMMENDATION

We recommend that further research should be conducted in other cities and internationally for fuller comparison of health-related quality of life among OA knee

patients in different settings.

Counseling should be provided to ensure better compliance and education.

Early consultation is advisable with an orthopedic surgeon and physical therapist.

OA patients should receive counseling to relieve depression and to enhance quality of life.

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

### DECLARATIONS

We acknowledge the support of our parents and teachers.

Both authors made similar contributions to the study. The research received no financial assistance or funding. There are no conflicts of interest or ethical issues.

Informed consent was secured from all participants, and data were collected pro forma.

Anonymity was protected throughout.

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