

# A Cross-sectional Study on Assessment of Quality of Life among Patients with Osteoarthritis

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## ABSTRACT

**Background:** Osteoarthritis, being one of the most important musculoskeletal disorders, affects a large group of population due to the pain, stiffness, problems with limitations in physical activities, and need for changes in daily life activities.

**Objectives:** The objectives were to study the symptoms among the individuals with osteoarthritis, to find the quality of life of affected individuals, and to evaluate the factors affecting quality of life.

**Methodology:** A hospital-based cross-sectional study was conducted among the patients with osteoarthritis attending the outpatient department of a tertiary care teaching hospital. An interviewer administered questionnaire was prepared which included sociodemographic details of the patients, their disease duration, clinical details, and comorbidities. Knee osteoarthritis outcome score (KOOS) was used to assess the pain, symptoms, problems in performing daily living activities, problems in higher level functions, and modifications in life made by the patients due to osteoarthritis. Obtained data were entered in Excel and analyzed and presented using descriptive statistical analysis, mean difference, and correlation.

**Results:** A total of 150 individuals with osteoarthritis participated in this study and majority (53.3%) were males. Mean age of the study group was years and mean duration of disease was 8.4 years. Most of the patients participated in the study (78.7%) were literates. Reduction in total score was noticed with increase in age and duration of disease. Obese individuals were found to have poor scores compared to individuals with normal body mass index (BMI). Statistically non-significant poor KOOS score was observed among females compared to males. Total change in the lifestyle was made by 9.3% of the patients due to the effect of osteoarthritis on them.

**Conclusion:** In the study population, severity of osteoarthritis varied with age, BMI, and duration of disease. The quality of life is significantly affected in these patients with osteoarthritis.

**Key words:** Factors, Knee, Knee osteoarthritis outcome score, Osteoarthritis, Quality of life

## INTRODUCTION

Musculoskeletal disorders include almost 150 various health problems and syndromes. Osteoarthritis is one of the joint disorders affecting millions of people worldwide. It is estimated that 18% of women and 9.6% of men worldwide were affected with osteoarthritis.<sup>1</sup> Knee osteoarthritis is the most common form of osteoarthritis. It occurs when the cartilage in breaks down over the time causing pain, swelling, and problem in moving the joint.<sup>2</sup> Over a long time, the problem gets worsen and leads to formation of spurs in the bone and thinning of cartilages in the affected joint.<sup>3,4</sup> Bits from the cartilage or bone may chip off and float in the joint. In later stages, if the problem is not recognized

and intervened, inflammatory process occurs with production of destructive cytokines overcoming the production of regulatory cytokines which causes further damage to cartilage.<sup>5</sup> The cartilage wears away over time which increases the stress in the joint and bone start rubbing against each other leading to further joint damage and pain.<sup>6</sup> The most commonly affected joints are knee, hip, and spine and small joints of the finger.<sup>7</sup> Most common symptoms of osteoarthritis include pain and stiffness in the morning and after rest. Extensive activity involving repeated joint movement causes swelling of the affected joint. The symptoms of osteoarthritis differ based on the joint affected and severity of the problem. Apart from the sufferings, due to the disease process, joint pain and reduced joint mobility affect

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the day to day activities of the affected individual creating dependence even for daily activities. This also has emotional, financial, and social impacts on the person.<sup>8,9</sup> Along with the negative health effects of the disease-related process, long-term medication intake for pain relief also has its own side effects. This creates additional burden on the overall health of the osteoarthritis patients. With increasing proportion of elderly population, sedentary lifestyle, and increase in prevalence of obesity, the burden of osteoarthritis is likely to increase.<sup>10-12</sup> Diagnosis of the problem depends mainly on the presence of symptoms such as pain and stiffness, clinical examination, and radiological features. Common risk factors for osteoarthritis include increasing age, obesity, previous joint injury, overuse of joint, weak thin muscles, and genes.<sup>1,2</sup> Osteoarthritis gradually worsens, and complete cure is often not possible. Staying active, maintaining a healthy weight, and early treatment shall slow the progression of the disease and help to improve the pain and joint function. The present study evaluated the impact of the disease process on quality of life of osteoarthritis patients which is often reduced due to effects of osteoarthritis on multiple domains of healthy life. The objectives were to study the symptoms among the individuals with osteoarthritis, to find the quality of life of affected individuals, and to evaluate the factors affecting quality of life.

## METHODOLOGY

A hospital-based cross-sectional observational study was conducted among the osteoarthritis patients attending the outpatient department (OPD) of a tertiary care Medical College Hospital located in Tiruchirappalli district of Tamil Nadu. This institution is located in rural area of the district providing health services to large group of heterogeneous population. Patients aged more than 30 years attending the OPD of orthopedics department were selected for the study. Patients confirmed as having osteoarthritis with clinical examination and radiological findings were included in the study. Both newly detected and old cases of osteoarthritis were included as participants. A total of 150 patients participated in the study. The study was conducted for 2 months and patients were selected using convenient sampling method. After obtaining informed consent from the patients, they were interviewed using a predesigned structured pro forma by the interviewers. The knee injury and osteoarthritis outcome score (KOOS) were used to assess the quality of life of the patients. The scale assesses the osteoarthritis-related problems felt by the individuals in the past 1 week. KOOS assesses 5 outcomes of osteoarthritis: (1) Symptoms and stiffness, (2) pain, (3) activities of daily living, (4) sport and recreation function, and (5) knee-related quality of life. All these 5 outcome measures are treated as subscales. The scale has a total of 42 questions and each question is given a score ranging from 0 to 4. For each subscale, total score is calculated, and 100 indicate no problem and 0 indicates severe problem. KOOS scale has already been validated in Tamil population and Tamil version of the scale was used. Excel sheet to enter the obtained score was available in the official website of KOOS and the same was used in this study for data entry. Entered data were analyzed using IBM Statistical Package for Social Sciences version 21. The results were presented in the form of mean, and student *t*-test was used to see the difference in the mean score and Pearson correlation was used to identify

the association between the variable and the outcome score.  $P < 0.05$  was considered as statistically significant.

## RESULTS

A total of 150 patients with osteoarthritis participated in this study. Mean age of the study group was  $54.4 \pm 10.03$  years ranging between 34 and 84 years. Majority of the patients were in the age group of 50-59 years. Among the participants, 80 (53.3%) were males and 70 (46.7%) were females. Mean duration of disease was  $8.4 \pm 3.2$  years with minimum duration as 1.5 years and maximum as 22 years. Comorbidities such as hypertension and diabetes were present among 30.7% and 25.3% of the study population (Table 1). The total mean KOOS score was  $94.8 \pm 28.2$  with a minimum total score of 20 and maximum score of 158. Reduction in the total score was noticed with increase in age of the patient and the change was statistically significant with Pearson correlation value of  $-0.26$  and  $P = 0.004$ . Mean total score was least among individuals aged more than 70 years indicating that osteoarthritis was worse among the older age group individuals (Figure 1). The mean total score was  $96.7 \pm 26.4$  among males and  $92.3 \pm 29.6$  among females. The score was less among females which denoted that quality of life was poor among them. The difference in the mean score between males and females was not statistically significant ( $P = 0.41$ ) (Table 2). Scores

**Table 1:** Characteristics of the study participants

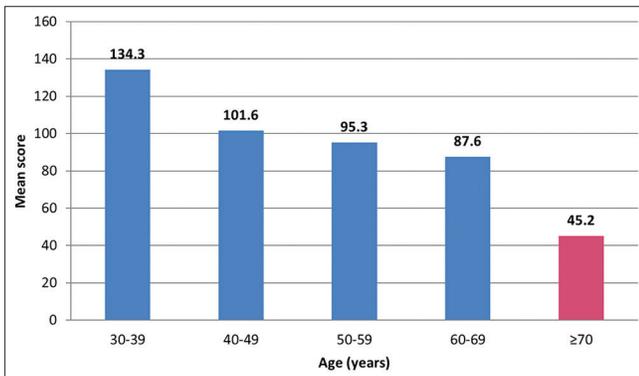
Parameters	Frequency n=150 (%)
Age (years)	
30-39	4 (2.7)
40-49	48 (32)
50-59	47 (31.3)
60-69	40 (26.7)
≥70	11 (7.3)
Gender	
Males	80 (53.3)
Females	70 (46.7)
Education status	
Primary school	11 (7.3)
High school	53 (35.4)
Higher secondary	33 (22)
Graduate	21 (14)
Illiterate	32 (21.3)
Duration of osteoarthritis (years)	
1-5	63 (42)
5.1-10	29 (19.3)
10.1-15	36 (24)
>15	22 (14.7)
BMI	
Normal	32 (21.3)
Overweight	70 (46.7)
Obese	48 (32)
Comorbidities	
Hypertension	46 (30.7)
Diabetes mellitus	38 (25.3)

BMI: Body mass index

**Table 2:** Mean scores obtained by the participants in each subscale of KOOS

Subscales of KOOS	Mean score $\pm$ SD			
	Male	Female	t value	P value
Symptom	12.18 $\pm$ 3.1	11.68 $\pm$ 2.7	1.03	0.30
Pain	22.03 $\pm$ 7.7	22.51 $\pm$ 8.04	-0.36	0.71
Activities of daily living	38.88 $\pm$ 13.1	38.77 $\pm$ 13.05	0.05	0.95
Functions, sports, and recreation	9.84 $\pm$ 3.9	9.35 $\pm$ 4.3	0.63	0.52
Quality of life score	8.62 $\pm$ 3.9	9.02 $\pm$ 4.1	-0.61	0.54
Total score	96.7 $\pm$ 26.4	92.3 $\pm$ 29.6	-0.82	0.41

KOOS: Knee osteoarthritis outcome score, SD: Standard deviation



**Figure 1:** Age difference in the mean knee osteoarthritis outcome score among the participants

for each of the 5 subscales of KOOS were calculated. Total attainable score for symptoms related to osteoarthritis was 0-28. The participants' minimum and maximum score was 7 and 19, respectively, and the mean score was  $11.9 \pm 2.9$ . With the median attainable score, 17.3% of the patients had their symptoms score more than the median value by the participants. As per KOOS scoring, maximum attainable score for questions related to pain was 36 and the score obtained from the study group ranged between 2 and 36. Mean score for pain was  $22.2 \pm 7.8$ . The scores were categorized into 2 based on the median attainable score and 75.3% had their pain score above the median score. KOOS scale has 17 questions related to daily living activities and functions, and the maximum attainable score was 68. The participants attained a score of 9 and 68 as minimum and maximum score. Mean activities score was  $38.8 \pm 13$  among the participants. Based on the median attainable activities of daily living score of 34.5, 70% of the participants' score was above the median value. A per the scoring pattern of KOOS, maximum attainable score by each participant was 20 for sports and recreation. Of the total 150 participants, the questions under sports and recreation were not relevant to be answered by 37 (24.7%) participants and the final score was calculated only for the rest 113 (75.3%). Maximum score obtained by the participants was 20 and the minimum was 0, and the mean score was  $9.6 \pm 4.1$ . With regard to sports and recreation, 38.5% of the participants had scored above the median attainable score of 10.5. The percentage was calculated with the participants for whom the questions were applicable and relevant. Last part of the scale was quality of life subscale, for which the attainable score was 0-16 since it has 4 questions. The score obtained by the participants was 0 and

16 as minimum and maximum score, respectively, and mean score was  $8.8 \pm 4$ . Using the median attainable score of 8.5, the scores were categorized into 2 groups and 64.7% have scored above the median value. Mean difference between males and females for all 5 subscales was not statistically significant. The total score decreased significantly with increase in age of the participants ( $r = -0.26$ ;  $P = 0.004$ ). Significant negative association was also noticed between obesity and total score. Total score decreased with increase in body mass index (BMI) ( $r = -0.18$ ;  $P = 0.000$ ). The total KOOS score decreased with increase in duration of osteoarthritis and this was statistically significant ( $r = -0.33$ ;  $P = 0.000$ ). This negative association between total score and disease duration was statistically significant. 25 (16.7%) individuals experienced swelling in the knee always in contrast to 6.6% who never had any complaints. Almost 40% often had catch up in the knee while moving and it was present always in another 15.3%. 28% and 17.3% of the participants always had difficulty in straightening and bending their knee fully. Problem of morning stiffness in the knee was present among 94.7%, and it was very severe among 10.6% of the individuals. Except for one participant, all other had pain in the knee joint and 15.2% were suffering with pain daily. 91% of the participants experienced difficulty in performing even the light domestic activities like cooking, and the problem was very severe among 4.7%. Lifestyle modification was done by 84.7% of the patients due to their knee osteoarthritis. About 45% of the study group have mildly changed their daily lifestyle, 18.5% has moderately changed their lifestyle, and 9.3% of them have totally changed their lifestyle due to osteoarthritis.

## DISCUSSION

This study was done to identify the severity of problems due to osteoarthritis faced by the individuals suffering with the problem and the factors related to that. The mean age of the osteoarthritis patients was  $54.4 \pm 10.03$  years. In the present study, the mean score was  $94.8 \pm 28.2$ . Age of the individuals had significant effect on the severity of the problem which was reflected by reduction in the score with increase in age. Significant negative impact of old age on quality of life in osteoarthritis patients was also observed by Chacon *et al.*, Pang *et al.*, and Zakaria *et al.*<sup>13-15</sup> Proportion of male patients was high compared to female patients. Similarly, another multicenter study found more male patients with osteoarthritis than female patients.<sup>16</sup> In contrast to this, studies by Jadhav *et al.*<sup>17</sup> and Kumar *et al.*<sup>18</sup> found more female patients affected with osteoarthritis than males. Although not statistically significant, mean score was low among females which imply that the problem due to osteoarthritis was worse among females than males. Negative association between female gender and quality of life score among osteoarthritis patients was observed and presented by other research studies conducted elsewhere.<sup>14,15,19</sup> However, the study conducted by Kumar *et al.* did not find any gender difference in the quality of life scores.<sup>18</sup> With increase in BMI, significant reduction was noticed in the total score which indicated that quality of life reduced with increase in BMI. The negative relation between BMI and quality of life was reported by other studies done among obese and non-obese osteoarthritis patients.<sup>20-22</sup> Osteoarthritis of knee has been shown to affect quality of life of obese individuals by reducing exercise capacity and limitation in physical activity.<sup>21,22</sup> In the present study,

reduction in total score was noticed with increase in duration of disease which indicated worsening of quality of life with increase in disease duration. In their study, Alrushud *et al.* also reported that both physical and mental health domains of quality of life were poor among individuals those who had osteoarthritis for long duration of time.<sup>23</sup> Among the participants, 17.3%, 75.3%, 70%, 38.5%, and 64.7% of them had poor osteoarthritis outcome score with regard to symptoms of arthritis, pain in the knee due to osteoarthritis, daily living activities, sports and recreation functions, and quality of life due to the impact of osteoarthritis. Maximum of 75.3% of the participated patients had poor score, due the pain, they felt due to arthritis of knee.

## CONCLUSION

Maximum score was attained by the patients in all domains except for symptoms due to osteoarthritis of knee, which indicated that patients were affected and worried about sufferings due to pain, difficulties in performing daily activities, physical functions, and changes in their life which has occurred due to osteoarthritis than the symptoms caused by the disease *per se*. Quality of life of the osteoarthritis was affected mainly due the pain in the knee and problems due to arthritis which affected the daily activities of the patients.

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