

Original Research Article

## Pain, Functional Disability and Quality of Life in Knee Osteoarthritis

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### ABSTRACT

**Background and Purpose:** Osteoarthritis is a progressive musculoskeletal condition and a major public health problem which imposes a significant health and economic burden on the society. The aim of the present study was to evaluate pain, functional disability and quality of life in osteoarthritis knee patients.

**Methodology:** A cross-sectional study was conducted in 60 subjects in the age group of 50 to 65 years diagnosed with unilateral osteoarthritis knee on the basis of American College of Rheumatology - Clinical Classification Criteria for Osteoarthritis of the knee. The demographic information of participants, such as, age, gender and dominance were recorded. Pain intensity was measured using visual analogue scale. The Western Ontario and McMaster (WOMAC) index, a disease-specific measure, was used to assess functional disability. Quality of Life was evaluated by the 36-Item Short Form Health Survey questionnaire (SF-36).

**Results & Conclusion:** Of the 60 OA knee patients, 18 (30%) were males and 42 (70%) were females. The mean age of the participants is  $56.77 \pm 4.78$  years. There was a positive correlation between pain and functional disability ( $r = 0.284$ ,  $p = 0.02$ ). Also, a positive correlation was observed between WOMAC score and physical component summary ( $r = 0.593$ ,  $p = 0.000$ ) and mental component summary ( $r = 0.593$ ,  $p = 0.000$ ) of SF-36 score. The study showed that there is a correlation between pain, functional disability and quality of life osteoarthritis knee patients. These components should be included during assessment which will provide a holistic and multimodal approach towards the understanding, planning and enhancement of management of these patients.

**Key words:** Knee osteoarthritis, quality of life, WOMAC score, function, pain.

### INTRODUCTION

Osteoarthritis (OA) is a progressive musculoskeletal condition affecting the society. It is a degenerative disease caused due to multiple risk factors. Peculiar pathological characteristics of knee osteoarthritis are degeneration of articular cartilage, structural changes in the subchondral bone and damage to the surrounding soft tissue. [1] It is a major public health concern which imposes a significant health and economic implications on the society due to its effects

on function and activities of daily living. [2,3] It has an effect on the entire knee joint including the synovial lining, cartilage, bone, tendons and ligaments around the knee joint structure. It is associated with breakdown of the cartilage, bony changes of the joints, deterioration of tendons and ligaments, and various degrees of inflammation of the synovium. [4] The signs and symptoms vary among the patients depending upon the severity of the condition. The common symptoms include knee joint pain, stiffness, swelling, reduced

mobility, reduced muscle strength, crepitus with movement, difficulty in walking, climbing stairs and squatting activities. The onset of these symptoms is gradual and progression of the disease leads to discomfort and disability.<sup>[4]</sup> Pain and reduced function are primary issues in patients with knee OA which lead to reduction in mobility and consequently pose great challenge in the performance of activities of daily living resulting in a decline in health-related quality of life.<sup>[5]</sup>

Quality of life is a multidimensional concept. According to the World Health Organization, "Quality of Life" is described as an individual's perception of his/ her position in life in the context of the culture and value systems in which he lives and in relation to his goals, expectations, standards and concerns.<sup>[6]</sup> It is the patient awareness of their current level of functioning and satisfaction when compared to what is perceived to be ideal by them. It is a phenomenon that varies from individual to individual.<sup>[7]</sup> It encompasses five main elements such as physical functioning, psychological functioning, social functioning, cognitive functioning, and general well-being.<sup>[8]</sup>

In patients with knee osteoarthritis, pain leads to reduced physical function which in turn has an impact on their activities of daily living which may have an impact on the physical and psychosocial aspects of an individual. The present study aimed to assess the impact of osteoarthritis knee on physical function and quality of life.

## **MATERIALS & METHODS**

A cross-sectional study was conducted after the approval of institutional research review committee. 60 subjects in the age group of 50 to 65 years diagnosed with unilateral osteoarthritis knee on the basis of American College of Rheumatology (ACR) Clinical Classification Criteria for Osteoarthritis of the knee.<sup>[9]</sup> Subjects with history of any knee surgery, traumatic injury to knee or on steroidal injection were

excluded from the study. Subjects were explained about the nature of the study in the language best understood by them. A duly signed written informed consent was taken from the subjects who were willing to participate in the study. The demographic information of participants, such as, age, gender and dominance were recorded.

Pain intensity was measured on a 0-10 visual analogue scale (VAS) anchored with the words 'no pain at all' and 'worst pain imaginable'. The participants were asked to mark a point on the scale which described their pain intensity. The Western Ontario and McMaster (WOMAC) index is a disease-specific measure to assess functional disability in osteoarthritis knee patients. It provides information in the areas of pain, stiffness and physical function in patients with knee OA.<sup>[10]</sup> WOMAC includes 5 items that measure pain, 2 items that measure stiffness and 17 items that measure physical function and was scored on a five-point Likert scale. Scores for each scale are created by summing the points of the individual items. Higher scores represent worse health status. It is a reliable and valid measure.<sup>[11]</sup> The Quality of Life was evaluated by the 36-Item Short Form Health Survey questionnaire (SF-36). The components were grouped as physical component summary (PCS) and mental component summary (MCS). PCS includes physical functioning, role limitations due to physical functioning, fatigue and pain whereas MCS includes role limitations due to emotional problems, emotional well-being, social functioning and general health.<sup>[12]</sup>

## **Statistical Analysis:**

Data were analyzed using SPSS version 20 (Statistical Package for Social Science). Descriptive statistics (mean  $\pm$  standard deviation) were determined for all measured variables. Pearson correlation test was used to assess the association between the variables. A 5% level of probability was considered as statistically significant.

## RESULTS

The present study included 60 OA knee patients in the age group of 50 to 65 years. Out of which 18 (30%) were males and 42 (70%) were females. The mean age of the participants is  $56.77 \pm 4.78$  years. Table 1 shows the demographic characteristics of the osteoarthritis knee patients. The mean values of pain (VAS score), functional disability (WOMAC score) and quality of life (SF-36 score) are depicted in Table 2. There was a positive correlation between pain and functional disability (Table 3). Also, a positive correlation was observed between WOMAC score and physical component summary (PCS) and mental component summary (MCS) of SF-36 score (Table 4).

**Table 1 Demographic characteristics of the OA knee patients.**

Patient Characteristics	Mean	Standard deviation
Age	56.77	4.78
Duration of disease	3.24	1.98
Body mass index	28.36	4.36
Employment status	N	%
Retired	11	18.3%
Employed	20	33.33%
Unemployed	29	48.3%

**Table 2 Mean values of pain, WOMAC score and quality of life.**

Variables	Mean	Standard deviation
Pain (VAS score)	5.47	1.07
Total WOMAC score	56.43	8.52
WOMAC – pain	11.32	2.06
WOMAC – stiffness	3.38	1.63
WOMAC – physical function	41.73	5.99
<b>Quality of life (SF-36 score)</b>		
Physical component summary (PCS)	41.94	14.49
Physical functioning	38	8.84
Limitations due to physical health	39.5	13.89
Bodily Pain	49.58	19.34
General Health	40.68	17.58
Mental component summary (MCS)	52.42	16.21
Limitations due to emotional problems	49.71	19.95
Vitality	41.92	17.1
Emotional well-being	62.47	17.58
Social functioning	55.58	19.89

**Table 3. Correlation between pain and WOMAC score.**

	WOMAC score
Pain	r = 0.284
	p = 0.02*

\*p value is significant at  $< 0.05$ .

**Table 4. Correlation between WOMAC score and quality of life.**

	Quality of life (SF-36 score)	
	Physical component summary (PCS)	Mental component summary (MCS)
WOMAC score	r = 0.593	r = 0.412
	p = 0.000*	p = 0.000*

\*p value is significant at  $< 0.05$ .

## DISCUSSION

Osteoarthritis (OA) is the most common degenerative joint disease and a frequent source of disability causing humane suffering and affecting the health of individuals. It leads to pain, movement dysfunction and difficulty in performance of daily activities. The present study showed there is a positive correlation between pain and WOMAC score which indicates that increase in the intensity of pain, increases the functional disability in the osteoarthritis knee patients. Also, a positive correlation was observed between WOMAC score and PCS and MCS component of the SF-36 score in knee osteoarthritis patients. It indicated that as the functional disability increases in the osteoarthritis knee patients, there is increased affection of the quality of life.

Quality of life is based on various components like physical health, mental status, and level of independence in performance of daily activities, social relationships and environment. Physical and mental affection in quality of life hinders the participation of an individual in the activities of daily living. Increased limitations in walking, stair climbing, and squatting interfere with activities of daily living and recreation. This in turn reduces the functional performance of an individual which has an impact on social participation of an individual that affects both physical and psychosocial domain. This affection of daily activities reduces physical and social functioning of an individual enroute towards mental and psychosocial problems along with physical pain.

Studies in the literature points out that people with OA often avoid physical exercise because of discomfort, fear of pain, or previous advice to avoid exercise. There is fear of movement which leads to reduction in mobility and thus increasing the function disability leading to decline in quality of life. It affects the social participation in thereby increasing physical isolation and social loneliness. [13,14]

A recently published study reported that there is a correlation between balance, fear of fall and quality of life in OA knee. Neuromuscular deficits in knee OA patients mainly include increased muscle weakness, impaired proprioception and altered postural control which lead to impaired balance control. This leads to lack of confidence and increased dependency in the individual resulting in reduction in physical function and quality of life. [15]

## CONCLUSION

The study showed that there is a correlation between pain, functional disability and quality of life osteoarthritis knee patients. These components should be included during assessment which will provide a holistic approach towards the understanding, functional diagnosis and rehabilitation of these patients.

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## REFERENCES

1. Felson DT, Lawrence RC, Dieppe PA, et al. Osteoarthritis: new insights. Part 1: the disease and its risk factors. *Ann Intern Med* 2000;133:635–46.
2. Fautrel B, Hilliquin P, Rozenberg S et al Impact of OA: results of nationwide survey of 10,000 patients consulting for OA. *Joint Bone Spine*. 2005; 72: 235-240
3. Fransen M, McConnell S, Harmer AR, Van der Esch M, Simic M, Bennell KL. Exercise for osteoarthritis of the knee. *Cochrane Database of Systematic Reviews*. 2015: Issue 1. Art. No: CD004376. DOI: 10.1002/14651858.CD004376.pub3.
4. Alshami A Knee osteoarthritis related pain: a narrative review of diagnosis and treatment. *International Journal of Health Sciences* 2014; 8(1): 85–104.
5. Odole AC, Ogunlana MO, Adegoke BOA, Ojonima F. Useh U. Depression, pain and physical function in patients with osteoarthritis of the knee: implications for interprofessional care. *Nigerian Journal of Medical Rehabilitation* 2015 Vol. 18, No 1: 116. Available at <http://www.njmr.org.ng>
6. Whoqol Group. The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. *Social science & medicine*. 1995 Nov 1; 41(10):1403-9
7. Cella DF and Tusky DS. Measuring quality of life today: methodological aspects. *Oncology* 1990; 5: 29-38
8. Revicki DA. Health-related quality of life in the evaluation of medical therapy for chronic illness. *J Fam Pract* 1989; 29(4): 377-80.
9. Altman R, Asch E, Bloch D, Bole G, Borenstein D, Brandt K, Christy W, Cooke TD, Greenwald R, Hochberg M, Howell D. Development of criteria for the classification and reporting of osteoarthritis: classification of osteoarthritis of the knee. *Arthritis & Rheumatology*. 1986 Aug 1; 29(8):1039-49.
10. McConnell S, Kolopack P, Davis AM. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC): a review of its utility and measurement properties. *Arthritis Rheum* 2001;45:453–61.
11. Bellamy N, Buchanan WW, Goldsmith CH, et al. Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. *J Rheumatol* 1988;15:1833–40.
12. Kawano M, Araújo IL, Castro MC, Matos MA. Assessment of quality of life in patients with knee osteoarthritis. *Acta Ortopedica Brasileira*. 2015; 23(6): 307–310.
13. Hootman JM, Macera CA, Ham SA, Helmick CG, Sniezek JE. Physical

- activity levels among the general US adult population and in adults with and without arthritis. *Arthritis Care Res (Hoboken)*. 2003;49(1):129-35.
14. Steultjens MP1, Dekker J, Bijlsma JW. Avoidance of activity and disability in patients with osteoarthritis of the knee: the mediating role of muscle strength. *Arthritis Rheum*. 2002 Jul;46(7):1784-8.
15. Walankar P, Jain A. Correlation between Balance, Fear of fall and Quality of Life in Osteoarthritis Knee. *Sch. J. App. Med. Sci.*, 2017; 5(7B): 2621-2624.

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