

## Relationship between ongoing pain intensity and health related quality of life in elderly population with total knee arthroplasty

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**Objective:** To determine the association between ongoing pain intensity and health-related quality of life in the elderly population after total knee arthroplasty.

**Methodology:** In this cross-sectional study, 118 patients were interviewed by using SF-12 and Visual analog scale (VAS) and non-probability convenient sampling. Participants were selected from different hospitals of Lahore in 4 months. The people who were 45 years or older, primarily diagnosed from osteoarthritis were included in the study.

**Results:** Mean age of patients was 65.61±6.80 years. We found that 26.3% were with no knee pain, 40.7% with mild pain, 32.2% with moderate pain and 0.8% of with severe pain on VAS. On SF-

12 questionnaire, 21.2% of patients had poor quality of life whereas 78.8% of patients had better quality of life after surgery. Results on chi-square test showed significantly strong association between pain intensity and health-related quality of life (p=0.001).

**Conclusion:** Improvement in knee pain after total knee arthroplasty correlates well with improvement in physical and mental domains of health-related quality of life. Total knee arthroplasty successfully enhances the quality of life by minimizing pain and improving mobility in osteoarthritis patients. (Rawal Med J 202;46:202-205).

**Keywords:** Knee pain, knee arthroplasty, quality of life, osteoarthritis.

### INTRODUCTION

Osteoarthritis is a joint disease that affects all the weight-bearing components of the joint. It is degenerative, "wear-and-tear" that occurs regularly over 50 year's old individuals. It most commonly occurs in 40% of females and 25% males of 60-70 years' age.<sup>1,2</sup> In Pakistan, 77.2% of females and 53.6% of males were affected by knee osteoarthritis.<sup>3</sup> Prevalence of osteoarthritis in knee joint is found to be 12.5% in elderly population.<sup>4</sup> In osteoarthritis, pain and swelling in joints are caused by degeneration of cartilages, ligaments and underlying bones.<sup>5</sup>

Total knee arthroplasty (TKA) is the most effective and successful treatment for constant knee pain and chronic osteoarthritis. It can reduce pain and improves function, enhances voluntary muscle activation and general functional tasks.<sup>6</sup> Recent data shows that 10-34% patients report significant pain after TKA.<sup>8</sup> Expected rate of growth of TKA is 7.9% in the United States and 5.3-14.7% in European countries.<sup>9</sup> Although it is considered as a risky and expensive procedure, it does provide better results than other medical treatments of knee

osteoarthritis.<sup>10</sup>

The patients with knee pain experience excessive loss of function and decline in health-related quality of life,<sup>11</sup> even if after TKA, they show increased satisfaction compared with other surgical procedures.<sup>12</sup> The present study hypothesized that not all individuals get relief from pain and show better outcomes after TKA.<sup>13,14</sup> Therefore, the aim of the study was to determine the association of pain with mobility and well-being of patients after TKA.

### METHODOLOGY

In this cross-sectional study, 118 patients were interviewed from Jinnah Hospital and Sheikh Zaid Hospital, Lahore, Pakistan on the basis of non-probability convenient sampling technique. The sample size of 118 was calculated from this formula;

$$n = \frac{z^2 \cdot 1 - \alpha / 2 \cdot \sigma^2}{d^2}$$

The study was conducted from June to September 2020 after approval from University Institutional Review Board, University of Lahore. The people of

both genders, who were 45 years or older, who underwent TKA by any orthopedic surgeon were included in the study. Those patients who had any history of drug abuse, trauma, malignancy, bone tumor and rheumatoid arthritis were excluded from the study.

Patients were asked about their quality of life (QOL) before and after TKA, which was assessed by the Short form-12 questionnaire (SF-12).<sup>15</sup> The SF-12 health-related quality of life questionnaire which consists of 12 items that are subsequently divided into physical and mental health status. Pain intensity was checked by the Visual analog scale (VAS) comprised of 10 items numbering scale to evaluate the pain intensity.

**Statistical Analysis:** Statistical analysis was performed using SPSS version 21. Quantitative variables are expressed as mean and standard deviation and qualitative variables are expressed in form of frequencies and percentages. Pearson Chi-square test was used to investigate the relationship between the ongoing pain intensity and quality of life.  $p < 0.05$  was considered significant.

## RESULTS

Out of 118 patients, 59.3% were male and 40.7% female. Mean age was  $65.61 \pm 6.80$  years. Out of 118, 34.7% patients were immediately post-operative (Table 1). There were 26.3% respondents who had no pain, 40.7% had mild pain, 32.2% had moderate pain, and only 0.8% had severe knee pain. We found that 78.8% patients tagged in better health conditions and so quality of life (Table 2).

**Table 1. Gender and examination period (n=118).**

Variable	Construct	Frequency	Percentage
Gender	Male	70	59.3%
	Female	48	40.7%
Examination period	immediate postoperative	41	34.7%
	1 year	47	39.83%
	3 years	21	17.80%
	5 years	9	7.62%

**Table 2. Ongoing pain intensity on VAS and total quality of life score.**

Variables	Construct	Frequency	Percentage
Ongoing Pain Intensity on VAS	No pain	31	26.3%
	Mild (1-3)	48	40.7%
	Moderate (4-6)	38	32.2%
	Severe (7-9)	1	0.8%
Quality of Life Score	<50 (poor health)	25	21.2%
	>50 (better health)	93	78.8%

**Table 3. Association between ongoing pain intensity and quality of life.**

Pain intensity	<50 (poor health)	>50 (better health)	P value
No pain	0 (0.0%)	31 (26.27%)	<0.001 "value is more than alpha level"
Mild (1-3)	1 (0.8%)	47 (39.83%)	
Moderate (4-6)	23 (19.49%)	15 (12.71%)	
Severe (7-9)	1 (0.8%)	0 (0.0%)	

Pearson Chi-square test was applied on two qualitative variables i.e. ongoing pain intensity and QOL after TKA. There was a significantly strong relationship between health-related QOL and ongoing pain intensity ( $\alpha \leq 0.05$ ) (Table 3). Chi-square test was applied to find another association between QOL and gender; its result showed  $p = 1.972$ . As the p-value was more than alpha level, that meant no association between gender and health-related QOL.

## DISCUSSION

It was found in the study that TKA proved itself to be a better intervention for osteoarthritis patients. It not only improved the QOL but pain as well. A similar study reported that the QOL has been enhanced and patients moved towards their daily living, as pain was reduced and after 2-3 months the patients were able to walk and climb stairs after TKA.<sup>17</sup> Regarding the QOL, a study conducted by Cherian et al, examined that men had better outcomes than women and showed more standard outcomes in functional and physical activity levels than women after TKA.<sup>18</sup>

The result of the current study is similar to previous studies that people get improvement regarding pain and health-related QOL after TKA. Pain which worsens over time and reduces the health-related QOL before undergoing surgery, becomes better for a long term after TKA.<sup>19</sup> One of the study found

good outcomes related to pain and QOL after TKA and patients got better knee function.<sup>20</sup>

In contrast to the current study, a study showed functional disability after TKA.<sup>16</sup> Whereas the present study showed that TKA helped to reduce the risk of the pain and improved QOL. Another study investigated on functional disability and range of motion after TKA and found there were excellent outcomes of TKA.<sup>21</sup> This study is in contrast to the present findings because range of motion is not explained expect health related QOL.

The current study showed that pre-surgical pain contributes to lower health-related QOL after TKA. But the people are achieving relief of pain and improving their functional activities after TKA. According to our knowledge it is the first study to be conducted in Pakistan.

## CONCLUSION

This study showed a significantly strong association between pain intensity and quality of life in the elderly population after total knee arthroplasty. The participants with moderate and severe pain had poor quality of life while patients with mild pain had good quality of life. Improvement in knee pain after total knee arthroplasty correlates well with improvement in physical and mental domains of health-related quality of life. The study concluded that total knee arthroplasty successfully enhances the quality of life by minimizing pain and improving mobility in osteoarthritis patients.

### Author Contributions:

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**Conflict of Interest:** None declared

Rec. Date: Oct 17, 2020 Revision Rec. Date: Jan 9, 2021 Accept Date: Feb 3, 2021

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