

PREDICTION OF FEAR FACTORS BEFORE TOTAL KNEE REPLACEMENT: A MIXED METHOD ANALYSIS ON ADVANCED KNEE OSTEOARTHRITIS PATIENTS

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ABSTRACT

Objective: To determine fear factors before total knee replacement in advanced knee osteoarthritis patients.

Study Design: Mixed method study.

Place and Duration of Study: Study was conducted at department of Orthopedics, Pakistan Ordnance Factory Hospital Wah Cantt, from May 2017 to May 2019.

Methodology: A sample of 105 knees was calculated using WHO calculator. Patients of Knee osteoarthritis were selected with consecutive sampling. Interviews were taken from patients for determining fear factors related to total knee replacement. SPSS version 24 was used for analysis.

Results: Total 105 knees of osteoarthritis were included in study. There were 51 (48.6%) male and 54 (51.4%) female in study. Mean age of patients was 59.8 ± 4.1 SD years. Most common fear factor according to patients priority for total knee replacement therapy was worsening of symptoms after total knee replacement 42 (40%) followed by pain persistence after total knee replacement 27 (25.7%), financial feasibility 21 (20%), and religious problems 15 (14.3%). Patients with osteoarthritis grading 4 had high pain scores, high stiffness scores and lower social function scores ($p=0.000$, $p=0.000$, $p=0.001$ respectively) on Western Ontario and McMaster Universities Osteoarthritis Index scale.

Conclusion: Total knee replacement therapy in advanced knee osteoarthritis is associated with several fear factors. Most common fear factor is worsening of symptoms after total knee replacement followed by pain persistence. Total knee replacement efficacy related counseling and community based awareness programs could be helpful in overcoming these fears and stigmas in Pakistan.

Keyword: Advanced knee osteoarthritis, Fear factors, Total knee replacement therapy.

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INTRODUCTION

Knee Osteoarthritis (KOA) is a common progressive disease, highly prevalent among females as compared to males (30% vs 10% respectively) worldwide¹. Knee osteoarthritis is more likely to increase with obesity, age, female gender, trauma, muscle weakness, kneeling, joint laxity and mechanical forces in general population². Disease progression varies from individual to individual. Common symptoms of knee osteoarthritis include knee stiffness, pain and swelling that worsen with time. Management of KOA begins with conservative treatment and can lead to surgical interventions³.

Total knee replacement therapy is a surgical

procedure in which damaged knee joint is replaced by artificial joint or prosthesis⁴. Recent literature reported that 3.48 million total knee replacements will be done by 2030 annually⁵. Pain followed by functional limitation is common primary indication for total knee replacement therapy. Literature reported three different types of knee replacement prostheses. These prostheses include i) non constrained prostheses (stability to prostheses is provided with ligaments and muscles of patients), ii) semi constrained (stability of prostheses is not totally dependent on patients ligament and muscles, however some stability is provided), and iii) constrained prostheses (used in patients whom muscles and ligaments are not able to provide stability)⁶.

Deep venous thrombosis, osteolysis, loosening, infection and stiffness are common complications of total knee replacement. Literature

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reported that heparin prophylactically is used for deep venous thrombosis prevention and provide support to stocking wear. Risk of infection is minimized by giving prophylactically antibiotics after surgery (within 24 hours). Stiffness of knee can be avoided by initiating knee movement within days or weeks after surgery. Physiotherapy and exercise interventions including knee strengthening, stretching and functional exercises showed short term effectiveness after total knee replacement therapy. Obesity, gender, age, surgical techniques and prosthesis design are significant predictors of total knee replacement outcomes⁷.

Turhan *et al*, reported that statistically significant difference was found between mean pain severity and fear of falling in 1st mobilization⁸. Lohmander. reported that total knee replacement therapy is associated with financial and social stigma fears in their society. However, the patients were more concerned about their worsening of post operative pain⁹. Unver *et al*, reported that "fear of falling" after TKR is most common fear following functional limitation in walking and stair climbing¹⁰. The concept of fear in Pakistan associated with surgery plays a significant role maintenance and development of avoidance behavior. This avoidable behavior results in prevention of early access to surgical outcomes. Present study will help to understand fear factors playing as major hurdle in choice of total knee replacement therapy. Present study was planned to determine fear factors before total knee replacement in advanced knee osteoarthritis patients.

METHODOLOGY

A mixed method study was conducted at department of orthopedics, Pakistan Ordinance Factory (POF) Hospital Wah Cantt. Study duration was 2 years (May 2017 to May 2019). A sample size of 105 knees was calculated using 16% prevalence of total knee replacement, 95% confidence interval and 7% margin of error using WHO calculator¹¹. Patients of total knee replacement were selected through non probability

consecutive sampling. Inclusion criteria was based upon age ranging from 55-70 years, both gender, patients diagnosed with symptomatic knee osteoarthritis, patients with radiological diagnosis (according to Kellgren and Lawrence grading 3-4) OA, patients diagnosed with primary knee osteoarthritis, patients with no previous history of knee surgery, patients with sufficient language skills for communication, patients eligible for total knee replacement therapy and those who were reluctant to TKR due to multiple reasons. Patients with systemic diseases (cardiac, neurological, psychiatric disorders and diseases affecting physical functioning), patients who underwent total knee replacement due other diseases (rheumatoid arthritis/traumatic injury) and those who were willing for TKR were excluded from study. Ethics approval was taken from ethics review board of POF hospital (POF-321). All patients signed written consent forms. Western Ontario and McMaster Universities (WOMAC) index¹¹, was used for measuring pain, stiffness, social functioning and emotional functions. Fear factors were measured by using a semi-structured interview including both open and closed ended questions. SPSS version 24 was used for data analysis in study. Mean and standard deviation was calculated for numerical data like age, pain scores, stiffness scores, social function scores and emotional functions scores. Frequency and percentages were measured for nominal and categorical variables like gender, mode of activity, laterality and fear factors. Effect modifiers like age and gender were controlled by stratification. Post stratification chi-square and t test was applied. A $p \leq 0.05$ was found significant in our study.

RESULTS

Total 105 knees with OA were included in study, who were unwilling for TKR due to fears. There were 51 (48.6%) male and 54 (51.4%) female in study. Mean age of patients was 59.8 ± 4.1 SD years. There were 57 (54.3%) patients in age group 55-60 years and 48 (45.7%) patients were in 56-70 years age group. Among all KOA patients, 39 (37.1%) of patients were limited to indoor for

their daily activities and 66 (62.9%) were community ambulators. Among all the knees, 20 (38.1%) required bilateral TKR and 65 (61.9%) require unilateral TKR.

Out of all, 40 (38.1%) were in “search of treatment other than TKR due to fears”. Among all KOA patients 105 (100%), 56 (53.3%) patients

Table-I: Frequency distribution of fear factors.

Fear Factors	Frequency (n=105)	Percentage
Worsening of symptoms after total knee replacement therapy	42	40
Pain persistence after total knee replacement therapy	27	25.7
Economic feasibility	21	20
Religious problems	15	14.3

Table-II: Association between fear factors, gender and age.

Fear Factors	Gender		p-value
	Male	Female	
Worsening of symptoms	9 (8.6%)	33 (31.4%)	0.003
Pain persistence	8 (7.6%)	19 (18.1%)	
Financial feasibility	19 (18.1%)	2 (1.9%)	
Religious problems	15 (14.3%)	-	
	Age		
	55-60 years	61-70 years	
Worsening of symptoms	26 (24.8%)	16 (15.2%)	0.002
Pain persistence	7 (6.7%)	20 (19%)	
Financial feasibility	19 (18.1%)	2 (1.9%)	
Religious problems	5 (4.8%)	10 (9.5%)	

were “willing to live with their pain despite of undergoing TKR therapy”. Source of fear related information was relative in 78 (74.3%), friends in 19 (18.1%) and media in 8 (7.6%) patients. Out of all patients who got information from relatives and friends (underwent TKR already), 64 (61%) were pain free after TKR, 26 (24.7%) had some time pain after TKR, and 15 (14.3%) had pain every time after TKR. Only 71 (67.7%) watched

video of TKR while 34 (32,3%) did not watch any video.

Most common fear factor according to patients priority for TKR therapy was worsening of symptoms after TKR 42 (40%) followed by pain persistence after TKR 27 (25.7%), financial feasibility 21 (20%), and religious problems 15 (14.3%) as shown in table-I. Fear factors were more common among females as compared to males ($p=0.003$). Patients in elder age group (55-60 years) were more feared with pain persistence (19%), as compared to younger age group (61-70 years) ($p=0.002$) as shown in table-II. Patients with osteoarthritis grading 4 had high pain scores, high stiffness scores and lower social function scores as shown in table-III.

Table-III: Pain, Stiffness, Social function and emotional function according to Osteoarthritis grading 4 using Western Ontario and McMaster Universities Osteoarthritis Index scores.

Western Ontario and McMaster Universities Osteoarthritis Index Scores	Osteoarthritis Grading 4	n	Mean ±SD	p-value
Pain scores	No	42	7.69 ± 0.55	0.000
	Yes	63	8.66 ± 0.47	
Stiffness	No	42	2.14 ± 0.35	0.000
	Yes	63	2.92 ± 0.78	
Social function	No	42	3.25 ± 0.67	0.001
	Yes	63	2.85 ± 0.47	
Emotional function	No	42	3.61 ± 0.76	0.304
	Yes	63	3.47 ± 0.64	

DISCUSSION

Knee osteoarthritis is associated with significant functional impairment and chronic knee joint pain. Total knee replacement therapy is an effective and safe method of functional restoration of knee and to alleviate pain¹². In Pakistan, total knee replacement therapy is associated with several fears due to lack of awareness¹³. In present study, most common fear factor according to patients priority for TKR therapy is worsening of symptoms after TKR 42 (40%) followed by pain persistence after TKR 27 (25.7%), financial feasibility 21 (20%), and religious problems (faith on

God despite of surgeon, after surgery they will not be able to perform prayers like namaz etc) 15 (14.3%). Momoli *et al*, reported that pain persistence prediction is common stigma for choice of Total knee replacement therapy by patient. However, 15-30% patients might suffer pain persistence even after successful surgery due to preoperative pain severity and obesity¹⁴. Shah *et al*, reported that pain is could be main factor for total knee replacement therapy resistance among KOA patients¹⁵. Malik *et al*, reported that mobility limitation and fear of surgery are associated with total knee replacement therapy avoidance¹⁶. Wylde *et al*, reported that economic constrains are most common factors affecting TKR choice in advance knee osteoarthritis patients¹⁷. Lfeld *et al*, reported that cost of implant, hospitalization charges and professional fee is \$33,646 limiting patients to select TKR due to individual resource constraints¹⁸. Khan et al reported that in Pakistan overall cost of TKR is 456981¹⁷. PKR (4360.51 US dollars), making procedure an expensive one for advanced knee osteoarthritis patients¹⁹. Another similar study reported that decreased health related quality of life, increased chronic pain and discomfort after total knee replacement is associated with social and functional fears²⁰. Kwoh reported that most common fear factors of TKR surgery are indoor and outdoor mobility, reduction in disability adjusted life years and improved quality of life²¹.

In present study, patients with osteoarthritis grading 4 had high pain scores, high stiffness scores and lower social function scores on WOMAC scale. Hanusch *et al*, reported that emotional function scores were 2.34 ± 0.66 SD before and after 3.33 ± 0.77 SD TKR ($p=0.02$)²². In present study, females are more prone to have fears as compared to males. However, other studies reported more social stigma associated with TKR among women as compared to men²³.

LIMITATION OF STUDY

Detailed in depth knowledge of fear factors regarding TKR needs purely qualitative analysis including in depth interviews.

CONCLUSION

Total knee replacement therapy in advanced knee osteoarthritis is associated with several fear factors. Most common fear factor is worsening of symptoms after surgery followed by pain persistence. TKR efficacy related counseling and community based awareness programs could be helpful in overcoming these fears and stigmas in Pakistan.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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