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Original Article

Pain Catastrophizing in Adult Females After Bilateral Total Knee Arthroplasty

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ABSTRACT

Total Knee Arthroplasty is a procedure used to ease the pain and improve functions after degenerative joint diseases e.g. osteoarthritis. One of the complications of TKA is pain catastrophization. Pain catastrophizing is a characterized by the tendency to magnify the threat value of pain stimulus. It can be assessed through PCS which is a 13-item standardized tool for assessing pain catastrophizing. Primary objective of the study was to find the pain catastrophizing level in adult females after bilateral Total Knee Replacement. **Objective:** This study aims to highlight the importance of pain catastrophization in females who have undergone TKA so that it will alert the rehabilitation experts to plan the post-operative management keeping in view respective levels of pain catastrophization. **Methods:** This was a descriptive case series study in which 30 patients were included in study according to inclusion and exclusion criteria according to non-probability convenience sampling. All females were included in the study with same baseline characteristics. Literature was reviewed for the given study from EMBASE, MEDLINE AND PsycINFO. Questionnaire included in the study was PCS. **Results:** The statistical result of Rumination with the mean of 11.63, Magnification score with the mean of 1.98 and Helplessness score with the mean of 12.13 was obtained. Total mean score of pain catastrophizing was 29.500 and SD ±6.273. **Conclusion:** Pain catastrophizing after bilateral TKR is one major complications in females. That resulted in score of 40% Rumination, 19% Magnification and 41% Helplessness.

INTRODUCTION

A high complexity procedure called Total Knee Arthroplasty (TKA) is carried out to ease the pain and improve function at advanced stages of degenerative joint disease, when conservative measures and other possible surgical options with less morbidity become incapable of providing satisfactory treatment. Surgical treatment of knee is a successful treatment for advanced knee osteoarthritis, with symptom improvement rates over and above 85% and long-term failure rates of less than 1% annually [1]. Only in the United States, there were 220.9 total knee arthroplasty surgeries performed from 2005 to 2008, up from 31.2 procedures per 100,000 person-years during the period from 1971 to 1976 [2]. By the end of year 2030 the incidence of TKA is predicted to increase by approximately 700% [3].

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A marked deformity of the knee, such as genu varum or valgum, gross instability or a limitation of motion, failure of non-operative management or a previous surgical procedure are some common indications for TKA. Other common indications include severe joint pain with weight bearing or motion that compromises functional abilities [4]. One of the best treatments for end-stage knee osteoarthritis is total knee arthroplasty, yet 10% of patients still exhibit inadequate function, strength, and mobility. Regular nursing care is crucial to the rehabilitation of patients after complete knee replacements [5]. The incidence of post-operative pain after Total Knee Arthroplasty is approximately 20%. Some preoperative factors are allied with higher chances of developing chronic post op pain which are high pain sensitization, female gender, high inflammation and Pain catastrophization [6]. The tendency to exaggerate the danger value of pain input, the sense of helplessness in this unpleasant environment, and a relative inability to control pain-related thoughts prior to, during, or after a painful encounter are all signs of pain catastrophizing [7]. Pain catastrophization can be assessed through a standardized 13 item instrument known as Pain Catastrophizing Scale (PCS). Using a 5-point scale with the end points (0) not at all and (4) always, participants are asked to reflect on prior painful experiences and rate how often they experienced each of 13 thoughts or feelings related to pain. Chronbach's alpha, which is reported to be 0.87, indicates that PCS has a high degree of consistency [8]. Just one research demonstrates that pain catastrophizing was not a significant predictor of postoperative pain, but this study also revealed that pain catastrophizing contributed significantly distinctive variance to the prediction of knee function one year after arthroplasty [9]. One of the study depicts that low operative mental health and pain catastrophizing have an obvious influence on outcome of TKA as compared to THA [10]. high levels of pain catastrophizing were a significant psychological predictor for more pain at 6 weeks, 3months, 6 months, 1 or 2 years' post-surgery. Twelve months after the TKR, there was no correlation between pre-operative pain thresholds (PPTs) and pain severity, and there was no interaction between gender and preoperative pain, change in pain intensity, PPTs, and change in the pain severity [11]. According to one study's findings, persistent pain persisting for three months after TKA was significantly predicted by pain catastrophizing in five of the trials examined. They came to the conclusion that there was moderate evidence for the relationship between pain catastrophizing and chronic pain after TKA [12]. In comparison to males, women are more prone to pain and more likely to report chronic musculoskeletal load. Additionally, it's been asserted that women experienced higher levels of catastrophizing and more distressing symptoms than men [13]. Pain catastrophization and depression have been shown to be associated with persistent pain and functional limitation after surgeries like total knee arthroplasty [14]. One of the best treatments for end-stage knee osteoarthritis is total knee arthroplasty, yet 10% of patients still exhibit inadequate function, strength, and mobility. Regular nursing care is crucial to the rehabilitation of patients after complete knee replacements [15]. Although TKA outcomes are generally positive, post-operative pain and functional status trajectories differ greatly; a sizable proportion of patients experience persistent pain and decreased function after the surgery [16]. In our current practice in Pakistan, it's mostly ignored to assess the post-operative level of Pain catastrophization which may affect the prognosis of recovery. This study aimed to highlight the importance of pain catastrophization in females who have undergone TKA so that it will alert the rehabilitation experts to plan the post-operative management keeping in view respective levels of pain catastrophization.

METHODS

The study design was Case series which was conducted at Ghurki Trust Teaching Hospital. Study duration was 6 months after the approval of synopsis. A sample size of 30 subjects is calculated by using the formula given below with 4% margin of error (d) and 0.125% anticipated population proportion of 95% level of confidence. Non probability convenience sampling was the technique used. Inclusion criteria: Females with bilateral total knee arthroplasty after six weeks' post operatively. Exclusion criteria: Mental disability, any other condition which can be a cause of pain catastrophization, Patients who refuse to participate in study. The written consent was taken from the patients of Ghurki Trust & Teaching Hospital who fulfilled the eligibility criteria. Total 30 females post-operative bilateral Total Knee Arthroplasty were included in the study. Under the supervision of an orthopedic surgeon, to fill the questionnaire using standardized tool for measuring levels of pain catastrophization called PCS.

RESULTS

Table 1 shows the demographics of the participants involved. Total 30 patients were included in this study; the gender distribution was 30 females only. The mean scores of age were 59.33±6.709, 22.2% participants were unemployed and 11.1% were employed. The Mean score of pain catastrophizing of 29.50±6.274 for total of 30 participants which shows that data is normally distributed. Table 2 depicts subscales scores and the minimum and maximum ranges of each subscale separately with the mean and standard deviation also. The table shows a

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minimum of 7.00, 2.00 and 4.00 while maximum of 16.00, 11.00 and 19.00 values of rumination, magnification and helplessness respectively. Total mean score of Pain Catastrophizing level in PCS is 29.500 with a SD of 6.27392 in total PCS. Pie charts shows That out of sample size of 30, 41% participants were feeling Helpless, 40% felt Ruminated and Magnification score was 19%.

Parameter	Analysis
Gender	30 (F)
Age	59.33±6.709
Occupational Status	22.2%(Un E),11.1%(E)
PCS scale	29.50±6.274

PCS(Pain catastrophizing scale),Un E(Unemployed), E(Employed)
Table 1: Descriptive statistical analysis(N=30)

Subscales Mean scores	Mean+SD	Range	Minimum	Maximum
Rumination Score	11.63+2.5	9.00	7.00	16.00
Magnification Score	5.70+1.9	9.00	2.00	11.00
Helplessness Score	12.13+3.7	15.00	4.00	19.00
Total Score of Pain Catastrophizing Scale	29.50+6.3	28.00	17.00	45.00

Table 2: Subscales Mean scores of PCS

DISCUSSION

Total knee arthroplasty is regarded as a successful treatment to enhance function and lessen discomfort in cases like advanced osteoarthritis of the knee. According to one study, women are more sensitive to pain than men are, and they are also more prone to complain of chronic musculoskeletal load than males. Additionally, there is evidence to support the notion that women experienced higher degrees of catastrophizing and more painful symptoms than men [13]. This may be the result of low pain threshold levels in females. According to our case series we also find out that pain catastrophization was seen in females undergoing TKR. Our findings suggest that most participants reported higher percentage of helplessness rather than magnification and rumination. According to another research published in December 2015, it was shown that people with greater pain catastrophizing had lower odds of having a positive 2-year result for knee OA, while people with greater self-efficacy had higher odds [17]. In a different trial, 117 individuals with a median age of 67.0 years (Q1–Q3: 59.0–72.0) were enrolled. Patients made up 53.3% of the population and were 70.1 percent white. Unadjusted analysis revealed a correlation between resilience and post-operative outcomes, which persisted for physical function even after accounting for PCS. The study reveals that postoperative knee function and general physical health are important in people who get TKA. Examining pretreatment mental health and resilience-focused therapy may improve the outcomes of patients' self-reported physical function following TKA [18]. At baseline, six weeks, three, six, and twelve months following TKA, participants completed questionnaires on pain catastrophizing and pain severity in another study. A cross-lagged panel study utilising variables for era, gender, race, initial anxiety, and mood disorders was carried out using structural equation modelling. Changes in pain catastrophizing between baseline and six weeks following TKA have been shown to be correlated with the intensity of subsequent pain. Future research is required to evaluate whether pain catastrophizing during the perioperative period can help patients receiving TKA achieve better clinical results [19]. Another study concluded that poor postoperative pain control is a risk factor for preoperative GAD, but when patients receive the right care, this risk factor can be altered. Preoperative GAD with GAD-2 screening and treatment referral may enhance patient outcomes and lower opioid use after TJA [20]. The striking feature of our study was that we separately figured out the pain catastrophizing sub scales levels of the participants who went through bilateral TKA in past 6 months. It would help in planning their rehabilitation protocol likewise. Whether the therapist needs to focus on the helplessness or the rumination or the magnification aspect of a patient.

CONCLUSION

Women who undergo bilateral TKR and were assessed for their pain catastrophization using PCS after 6 weeks of their operations showed significant level of exaggerated response of pain.

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