Contents lists available at ScienceDirect



Journal of Clinical Orthopaedics and Trauma

journal homepage: www.elsevier.com/locate/jcot



Education, engagement and provision of empathy by trained counselor enhances the patient satisfaction after Total Knee Arthroplasty



Sanjay Bhalchandra Londhe ^{a, *}, Ravi Vinod Shah ^b, Pritesh Omprakash Agrawal ^c, Jehangir Malcolm Pestonji ^a, Shubhankar Sanjay Londhe ^d, Maulik Kiranbhai Langaliya ^a

^a Hoy Spirit Hospital, Andheri, India

^b Criticare Superspeciality Hospital, Andheri, Mumbai, India

^c Civil Hospital, Mehsana, Gujarat, India

^d Dr Vishwanath Karad MIT World Peace University, Pune, India

A R T I C L E I N F O

Article history: Received 28 November 2020 Received in revised form 6 December 2020 Accepted 14 March 2021 Available online 23 March 2021

Previous presentation: This data was presented as an abstract oral presentation at **British Orthopedic Association Virtual Congress 2020** on September 23, 2020.

Keywords: Total knee arthroplasty Patient counseling Patient satisfaction

ABSTRACT

Background: One of the major concerns following Total Knee Arthroplasty (TKA) surgery is patient satisfaction. Hence, this study sought to assess the effect of patient education, engagement and provision of empathy delivered by trained counselor on patient satisfaction.

Methods: All the patients included in the study were randomly allocated to two groups: Patients who received counseling from trained personnel during pre-, peri- and post-TKA phase constituted group-A (n = 100) whereas patients who were advised by the surgeon before the procedure constituted group-B (n = 100). All the patients who were counseled by trained personnel continued to receive counseling up to six months following TKA surgery. Patients belonging to group-A were provided counseling pertaining to education related to TKA procedure, the modalities of pain management and post-TKA ambulation regimen. Patient satisfaction was measured with Forgotten Joint Score-12 (FJS-12) and consumer gap (defined as the difference between patient perception and expectation) was recorded by an independent observer after 52-week of the TKA procedure.

Results: Patients belong to group-A had higher satisfaction as compared to those in group-B as evident by statistically higher FJS-12 score ($64.5 \pm 16.4 \text{ vs.} 59.4 \pm 17.9$; p = 0.0369). There was statistically significant difference observed in consumer gap between group-A (6%) and group-B (16%) (p = 0.0242). *Conclusions:* The results of the study are encouraging to employ counseling by trained personnel during

pre-, peri- and post-TKA phases as to improve patient satisfaction and reduce consumer gap.

© 2021 Delhi Orthopedic Association. All rights reserved.

1. Introduction

Total Knee Arthroplasty (TKA) is one of the most commonly performed surgical procedure.^{1–4} However, a considerable number of patients (\sim 20–30%) remains dissatisfied with the outcome of the TKA procedure.^{5–9} Patient related factors including age, sex, body mass index (BMI), and preoperative depression have been

identified as determinants of patient dissatisfaction following TKA procedure. Apart from aforementioned factors, surgical technique, hospital environment, and post-operative pain, informational, clinical and personal support to the TKA patient also contribute to the patient dissatisfaction after TKA procedure. Extensive efforts are being made to enhance procedural outcomes along with patient satisfaction.

This study was designed to assess the impact of counseling on patient satisfaction provided by trained personnel during pre-, peri- and post-operative period of TKA procedure in comparison to patients counseled by the surgeon only before the procedure. As consumer gap that results from the difference between preoperative patient expectations and the actual patient perception about the TKA surgery also have huge impact on patient satisfaction

^{*}Corresponding author. Holy Spirit Hospital, Mahakali Caves Road, Andheri East, Mumbai, 400093, Maharashtra, India.

E-mail addresses: sanlondhe@yahoo.com (S.B. Londhe), rvsorth@yahoo.co.in (R.V. Shah), priteshagrawal629@gmail.com (P.O. Agrawal), jehpestonji@dr.com (J.M. Pestonji), shuantusonde@gmail.com (S.S. Londhe), langaliya.maulik@gmail.com (M.K. Langaliya).

following TKA procedure, the impact of the intervention on consumer gap was also assessed in the present study.

2. Material and methods

This was a prospective randomized study. The sample size was estimated to be 200 (100 patients in each group) with alpha error of 0.05 and beta error of 0.2 with power of study being 80%. The study was approved by local ethics committee. Written informed consent from all enrolled patients was obtained. This prospective randomized study enrolled patients who underwent TKA based on pre-defined inclusion and exclusion criteria. All the patients who underwent unilateral TKA for end stage osteoarthritis were eligible for the enrollment of the study. However, patients with preexisting psychiatric illness with ongoing medications were excluded from the study. A total of two hundred patients were randomized into two groups through computerized random envelope method. Patients who were counseled by trained personnel in the preoperative, perioperative and post-operative phase (at 1,2,4, 8,16 and 24 weeks post-surgery) constituted Group-A. Likewise, the patients who were assigned alternate intervention - preoperative counseling by surgeon represented Group-B. The counselor guided the patients about TKA procedure, management of pain with different modalities and post-surgery ambulation program. The minimum time spent by the counselor with the TKA patient was 30 min. The counselor had a unique advantage as she had herself undergone a successful bilateral TKA procedure. The counselor was trained to relieve patients' fear and to reassure them on the course of recovery.

Irrespective of the interventions, all the patients were treated in the same manner. All the patients were operated by the same surgical team. The procedure was performed according to standard practice using medial arthrotomy with a tourniquet. All the patients received standard antibiotic prophylaxis pre- and post-operatively. Before the implantation, all the patients were administered a periarticular injection. A posterior stabilized (PS) type knee implant (Maxx Freedom Knee) was used for all the patients. All the patients were given adductor canal block at the end of TKA procedure. A multi-modal analgesia approach was used for post-operative pain management which involved IV (intravenous) paracetamol followed by oral paracetamol, IV tramadol followed by oral tramadol and buprenorphine transdermal patch. Non-steroidal anti-inflammatory drugs (NSAIDS) were given as a rescue analgesic. Pregabalin (75 mg) was started one day prior to surgery and continued up to 2 months post TKA. Physiotherapy was started immediately after the surgery and was continued at home under supervision of physiotherapist for 3–4 weeks.

Pre- and post-operative clinical characteristics of the patients such as age, BMI, gender, diagnosis, co-morbidities, Forgotten Joint Score-12 (FJS-12 score), range of motion (ROM), visual analog score (VAS), and degree of deformity were recorded by an independent observer. Likewise, after 52 weeks of the procedure, patient satisfaction and consumer gap was recorded by an independent observer. Patient satisfaction was measured with Forgotten Joint Score-12 (FJS-12). The consumer gap was evaluated by asking the patient about their satisfaction level post-TKA surgery. They were asked to rate their satisfaction as very satisfied, satisfied, dissatisfied and very dissatisfied. The consumer gap was said to be present when the response was dissatisfied and very dissatisfied. The post-operative ROM, hip-knee-ankle alignment and VAS score were also recorded by the independent observer.

2.1. Statistical analysis

The sample size was estimated to be 200 (100 patients in each

group) with α -error of 0.05 and β -error of 0.2 while considering the power of study being 80%. Difference between two-groups was calculated using un-paired t-test. Chi-square test was used to determine statistically significant association between two groups. A p-value <0.05 was considered statistically significant. Statistical analysis was carried out using SPSS version 15.

3. Results

A total of 200 patients were randomly allocated to group-A (n = 100) and group-B (n = 100). There was no statistically significant difference in pre-operative characteristics between patients of Group A and Group B (Table 1). No patient was lost to follow up at 52 weeks. At post-procedural week-52, patient satisfaction was measured using FJS-12 score. Statistically significant difference was observed in FJS-12 score between group-A and group-B (p = 0.0369). Patients belonging to group-A (64.5 ± 16.4) reported statistically higher FJS-12 score as compared to patients in group-B (59.4 \pm 17.9). Only 6% of the group-A patients were found to have consumer gap whereas it was 16% among patients of group-B. The difference in consumer gap was statistically significant (p = 0.0242). There was statistically insignificant difference in mean hospital stay and post-operative hip-kneel-ankle alignment axis between group A and group B. There was no statistically significant difference between group A and group B as regards the post-operative ROM and VAS score. (VAS score of 2.2 ± 0.8 in group A versus 2.3 \pm 0.1 in group B, p value 0.2163, statistically not significant, ROM of 121.5 \pm 21.3 in group A versus 119.5 \pm 23.5 in group B, statistically not significant, p value 0.5290 (Table 2).

4. Discussion

Although majority of the patients opt TKA surgery now-a-days for relieving their knee-pain, patient satisfaction following the surgery still has scope of improvement. Patient satisfaction ranges from 75% to 92% after TKA. Patient dissatisfaction rate was 17% among the patients included in Swedish Knee Arthroplasty Registry.⁷ Patients who underwent TKA surgery are less likely to be satisfied with the knee replacement as compared to their treating surgeons.^{10,11} Harris et al.¹² reported difference between patient satisfaction and operating surgeon satisfaction in 331 TKA patients twelve months post surgery (90.3% vs 94.5%). Notably, the results of the National Joint registry underscore the importance of patient counseling as only 21% patients rated the results as excellent despite of perceived improvement of knee symptoms observed in 71% of the patients.¹³ Patients who underwent TKA surgery are less likely to be satisfied with the knee replacement as compared to their treating surgeons. This could be explained by difference in the measurement of the outcomes for example, treating surgeon measures the outcomes of the procedure in terms of post-operative range of motion, radiographic improvement or implant survivorship and patient variables are often not taken into consideration. On the other side, hospital experience, post-operative pain, clinical and personal support received during peri-operative and postoperative period also affect patient satisfaction. Hence, to optimize outcomes of TKA procedure from patient perspective, various patient reported outcome measures (PROMs) have been designed which include Knee Society Clinical Rating System, 36-item Short Form Health Survey (SF-36), the 12-item Short Form Health Survey (SF-12), Oxford Knee Score (OKS), Knee Injury and Osteoarthritis Outcome Score (KOOS) and Western Ontario and McMaster Universities Arthritis Index (WOMAC). Moreover, various measures are also employed to enhance the outcomes of the TKA procedure like Robotics assisted surgery, computer navigation assisted surgery, minimally invasive surgery, day care procedure TKA, gender

S.B. Londhe, R.V. Shah, P.O. Agrawal et al.

Table 1

Comparison of pre operative patient characteristics between Group A and Group B.

Parameters	Group A	Group B	p value
Number of patients (n)	100	100	-
Mean Age (years)	69.4 ± 14.5 (57-81)	66.5 ± 15.7 (55-84)	0.2284
Mean BMI (kg/m ²)	28.5 ± 4.9	27.9 ± 5.6	0.4210
Gender			
Females	n = 82 (82%)	n = 79 (79%)	0.5933
Males	n = 18 (18%)	n = 21 (21%)	0.5933
Mean Preoperative ROM	96.1 ± 18.3	95.6 ± 17.9	0.8453
Preoperative degree of deformity (varus)	8.9 ± 3.5	9.7 ± 3.2	0.0932
Preoperative clinical diagnosis			
OA	n = 88 (88%)	n = 86 (86%)	0.6749
RA	n = 10 (10%)	n = 11 (11%)	0.8180
Others	n = 2 (2%)	n = 3 (3%)	0.6514
Pre operative Associated co-morbidity:			
Cardiac	36 (36%)	38 (38%)	0.7701
Renal	16 (16%)	19 (19%)	0.5776
Hepatic	3 (3%)	2 (2%)	0.6514
Mean Preoperative FJS-12	12.20 ± 11.5	11.91 ± 12.1	0.8576
Mean Preoperative VAS score	7.3 ± 2.8	7.4 ± 1.7	0.7605

Table 2

Comparison of post operative patient characteristics between Group A and Group B.

Parameters	Group A	Group B	p value
Mean hospital stay duration (days)	4.4 ± 0.1	4.3 ± 0.8	0.2163
Mean Post-operative Knee Alignment (HKA angle or FT angle) (degrees)	181.9 ± 0.9	182.1 ± 0.6	0.0659
Mean Post operative ROM	121.5 ± 21.3	119.5 ± 23.5	0.5290
Mean Postoperative VAS score at 52 weeks	2.2 ± 0.8	2.3 ± 0.1	0.2163
Mean Postoperative FJS-12 at 52 weeks	64.5 ± 16.4	59.4 ± 17.9	0.0369
Consumer gap at 52 weeks	6 (6%)	16 (16%)	0.0242

specific implants, and alternative bearing implants.^{14–16} Moreover, a good patient-surgeon relationship is also essential for good patient-surgeon rapport and successful TKA outcome.

Goldsmith et al.¹⁷ reported that informational, clinical and personal support to the TKA patient is extremely important for improving patient satisfaction. The effect of pre-operative education and counseling on patient satisfaction post TKA surgery has been extensively studied. However, the studies reported contradictory results. Results of few studies reported no effect of preoperative education on patient outcomes.^{18,19}

Louw et al.²⁰ concluded that preoperative educational sessions increased the knowledge of patients on pain science and thereby facilitate effective management of postoperative pain. Brian Lucas et al.²¹ proposed to develop a structured pre-operative information and assessment clinic using a Social Cognitive Theory framework for the benefit of patients. Another study also demonstrated enhanced patient satisfaction score when web-based patient education was provided prior to the outpatient orthopedic surgery.²² In our study, we hired a well-educated counselor to educate, engage and empathize the patients about pain science and postoperative expectations after TKA. Apart from unique advantage of having successful bilateral TKA procedure, the counselor had sound knowledge of the protocols of the surgery, the likely complications and the expectations patients have after the TKA surgery. Selfexperience along with technical knowledge would help her to advise patients more effectively. This is reflected in results of the study. We found that the patient satisfaction was significantly better in group A, who had received explicit advices from a counselor. Presumably, to the best of our knowledge, this is probably the first study so far to involve a counselor for educating and counseling the TKA patient in the pre, peri and post-operative period.

Our study has certain limitations. First, the patient reported satisfaction is a highly subjective parameter. The continuous engagement of the counselor with the patient might have improved the patient's informational and personal support and thereby improved the satisfaction. Another limitation was informational and empathy support given by the counselor is highly individualized. No two counselors can be expected to be of the same caliber. However, this limitation can be overcome by formal structured training of the counselors.

5. Conclusion

This study justifies that the counseling provided by a trained counselor to the patients undergoing TKA has significant improvement in patient satisfaction and simultaneous reduction in consumer gap. Therefore, we strongly advocate the employment of a trained counselor for TKA patients during pre-operative, perioperative and post-operative stage.

Declaration of competing interest

The authors declare that they have no conflict of interest.

Acknowledgement

The authors are thankful to Ms. Arohi Sarang and Dr. Udita Chandra for their support in manuscript editing.

Abbreviations

Total Knee Arthroplasty TKA Range of Motion ROM Forgotten Joint Score-12 FJS-12 Visual Analog Score VAS

Funding

There is no funding source.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Ethics approval

Local ethics committee approval was obtained before the study. Also, all patients consented to participate.

Consent for publication

We hereby give our consent for publication.

Authors' contributions

All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole, and have given their approval for this version to be published.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

References

- Beswick AD, Wylde V, Gooberman-Hill R, Blom A, Dieppe P. What proportion of patients report long-term pain after total hip or knee replacement for osteoarthritis? A systematic review of prospective studies in unselected patients. *BMJ Open.* 2012;2(1), e000435. Feb, 22.
- Heck DA, Robinson RL, Partridge CM, Lubitz RM, Freund DA. Patient outcomes after knee replacement. *Clin Orthop Relat Res.* 1998;(356):93–110. Nov.
- 3. Kane RL, Saleh KJ, Wilt TJ, Bershadsky B. The functional outcomes of total knee arthroplasty. J Bone Joint Surg Am. 2005;87(8):1719–1724. Aug.
- Riley Jr LH. Total knee arthroplasty. Clin Orthop Relat Res. 1985;192:34-39, 1985, Jan-Feb.
- Anderson JG, Wixson RL, Tsai D, Stulberg SD, Chang RW. Functional outcome and patient satisfaction in total knee patients over the age of 75. J Arthroplasty. 1996;11(7):831–840. Oct.
- 6. Chesworth BM, Mahomed NN, Bourne RB, Davis AM. Willingness to go through

surgery again validated the WOMAC clinically important difference from THR/ TKR surgery. J Clin Epidemiol. 2008;61(9):907–918. Sep.

- Dunbar MJ, Robertsson O, Ryd L, Lidgren L. Appropriate questionnaires for knee arthroplasty, results of a survey of 360 patients from the Swedish knee arthroplasty registry. J Bone Joint Surg Br;. 2001;83(3):339–344. Aprl.
- Hawker G, Wright J, Coyte P, et al. Health-related quality of life after knee replacement. Results of the knee replacement patient outcomes research team study. J Bone Joint Surg Am. 1998;80(2):163–173. Feb.
- Robertsson O, Dunbar M, Pehrsson T, Knutson K, Lidgren L. Patient satisfaction after knee arthroplasty: a report on 27,372knees operated on between 1981 and 1995 in Sweden. Acta Orthop Scand. 2000;71(3):262–267. June.
- Lau RL, Gandhi R, Mahomed S, Mahomed N. Patient satisfaction after total knee and hip arthroplasty. *Clin Geriatr Med.* 2012;(3):349–365. Aug 28.
 Matsuda S, Kawahara S, Okazaki K, Tashiro Y, Iwamoto Y. Postoperative
- Matsuda S, Kawahara S, Okazaki K, Tashiro Y, Iwamoto Y. Postoperative alignment and ROM affect patient satisfaction after TKA. *Clin Orthop Relat Res.* 2013;471(1):127–133. Jan.
- Harris IA, Harris AM, Naylor JM, Adie S, Mittal R, Dao AT. Discordance between patient and surgeon satisfaction after total joint arthroplasty. J Arthroplasty. 2013;28(5):722–727. May.
- Baker PN, Rushton S, Jameson SS, Reed M, Gregg P, Deehan DJ. Patient satisfaction with total knee replacement cannot be predicted from preoperative variables alone: a cohort study from National Joint Registry for England and Wales. *Bone Joint Lett J.* 2013;95– B(10):1359–1365. Oct.
- Selvanayagam R, Kumar V, Malhotra R, Srivastava DN, Digge VK. A prospective randomized study comparing navigation versus conventional total knee arthroplasty. J Orthop Surg. 2019 May-Aug;27(2), 2309499019848079.
- Singisetti K, Muthumayandi K, Abual-Rub Z, Weir D. Navigation-assisted versus conventional total knee replacement: no difference in patient-reported outcome measures (PROMs) at 1 and 2 years. Arch Orthop Trauma Surg. 2015 Nov 1;135(11):1595–1601.
- 16. Khakha RS, Chowdhry M, Norris M, Kheiran A, Patel N, Chauhan SK. Five-year follow-up of minimally invasive computer assisted total knee arthroplasty (MICATKA) versus conventional computer assisted total knee arthroplasty (CATKA)—a population matched study. *Knee*. 2014 Oct 1;21(5):944–948.
- Goldsmith LJ, Suryaprakash N, Randall E, Shum J. The importance of informational, clinical and personal support in patient experience with total knee replacement: a qualitative investigation BMC MusculoskeletDisord. 2017;18: 127. Published online 2017 Mar 24:1474-8.
- 18. Issa K, Rifai A, Boylan MR, Pourtaheri S, McInerney VK, Mont MA. Do various factors affect the frequency of manipulation under anesthesia after primary total knee arthroplasty? *Clin Orthop Relat Res.* 2015 Jan 1;473(1), 143-7.
- Tyagi V, Huez C, Henderson S, et al. The effect of a preoperative education class on the rate of manipulation under anesthesia after total knee arthroplasty in a veterans population. *Arthroplasty today*. 2018 Sep 1;4(3):359–362.
- Louw A, Diener I, Butler DS, Puentedura EJ. Preoperative education addressing postoperative pain in total joint arthroplasty: review of content and educational delivery methods. *Physiother Theor Pract.* 2013 Apr 1;29(3):175–194.
- Lucas B, Cox C, Perry L, Bridges J. Pre-operative preparation of patients for total knee replacement: an action research study. *International Journal of Orthopaedic and Trauma Nursing*. 2013 May 1;17(2):79–90.
- 22. Van Eck CF, Toor A, Banffy MB, Gambardella RA. Web-based education prior to outpatient orthopaedic surgery enhances early patient satisfaction scores: a prospective randomized controlled study, 2325967117751418 Orthop J Sports Med. 2018;6(1). Jan, 26.