Editorial

Meeting patient expectations and ensuring satisfaction in total knee arthroplasty

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Introduction

Osteoarthritis (OA) of the hips and knees is estimated to be the fourth leading cause of functional disability globally. OA is strongly associated with ageing and the Asian region is indeed aging rapidly. The morbidity burden of OA in Asia is significantly increasing (1). In Asia, there is a greater demand for a pain-free knee joint of good range of motion due to cultural, religious or simply lifestyle reasons. Asians are more likely to squat and kneel for prolonged periods of time. Prolonged squatting has been suggested to account for a significant variation in prevalence of knee OA between Chinese subjects from Beijing, China and White subjects participating in the Framingham OA study (2). Total knee arthroplasty (TKA) has been thought to be the definitive solution for chronic mechanical knee pain secondary to OA. the definitive solution for chronic mechanical knee pain secondary to OA. The number of TKAs performed has been increasing steadily over the years according to the national registry in Seoul, Korea (3), as with the rest of the Asia-Pacific region. However, patients' expectations of TKA outcomes seem to differ from the measured outcomes of the surgery (4). Most expected patient-reported outcomes were improvement in pain, restoration of function and resolution of need for assistive devices. There is a significant difference between actual and expected activities after TKA for OA. While TKA relieves pain and restores function beyond doubt, several studies have showed that only 82-89% of patients expressed satisfaction after their primary total knee replacement (5-12). Patient satisfaction is fast becoming an important tool for assessing outcome of TKA (13). However, patient satisfaction is a complex phenomenon that is affected by many elements that determine health-related quality of life (14). This is influenced by the patient's cultural, social and psychological make as well. It is well known that many cultural practices in Asia requires the patient to kneel and/or squat and the ability to achieve this post-TKA will undoubtedly have some impact of patient satisfaction scores. Good clinical and functional outcome as determined by clinicians does not always equate to patient satisfaction as the difference between patients' and clinicians' perception of good outcomes is well known (15). This has led to the development and validation of patient-reported outcome measures (PROMs) or otherwise known as patient satisfaction scores in orthopaedic surgery. While there are numerous tools to measure patient satisfaction after these procedures, it is the long-term satisfaction that is the most important goal of surgery in patients with OA (11). This editorial will evaluate patient satisfaction following TKA as well as the factors that have a profound influence on satisfaction.

What is patient satisfaction?

The concept of patient satisfaction has been around for at least three decades. In 1983, Ware *et al.* (16) wrote on the theory of patient satisfaction. In their paper, they explained the difference between objective and subjective outcomes. They further described patient satisfaction as being composed of satisfaction determinants and satisfaction components. Satisfaction determinants are patient-dependent variables that affect the degree of satisfaction the patient experiences. Satisfaction components refer to a measure of care that is actually received. In a more recent review by Chow *et al.* (17), it is explained that patient satisfaction provides the ultimate end point of the patient's

perspective. Satisfaction can also be thought of as giving an end point to the assessment of the quality of health care. Patient satisfaction is affected jointly by current health state as well as quality of life and gives us an important balance against the normally dominant perspective of the health care provider. Thus, measurement of satisfaction is an essential part of quality assessment after TKA.

How is patient satisfaction measured?

Surveys and questionnaires are tools that measure patient satisfaction. Of the numerous surveys and questionnaires that are available, only a few are specific to TKA. Tools that measure patient satisfaction must be tested and validated through psychometric analysis (18). This implies application of scientific methodology to the measurement of patient satisfaction. Validation generally consists of three components—validity, reliability and responsiveness. In the past, patient satisfaction questionnaires and surveys have been off the mark when validated using psychometric analysis. Sitzia and Wood (19) evaluated patient satisfaction studies and found that only 6% of the 181 studies reviewed utilized principles of psychometric analysis to validate the tools utilized to measure patient satisfaction. Of these studies, none were specific to arthroplasty. To date, we are only aware of two patient satisfaction scales specific to arthroplasty that have been demonstrated to have validity and reliability. One is the patient satisfaction scale developed by Mahomed *et al*. (20) and the other by Dunbar *et al*. (18). Most institutions today measure patient satisfaction via the use of WOMAC, SF-36, SF-12, the Oxford Knee Score and the Knee Society Score (21-25).

Patient satisfaction in total knee arthroplasty (TKA)

Most studies to date have reported that satisfaction following TKA is high. However, there is always that population of patients that are dissatisfied after surgery. Mahomed *et al*. (20) evaluated 857 patients 1 year following TKA and reported an overall satisfaction score of 88%. A study on 25,275 patients from the Swedish Joint Arthroplasty Registry showed a satisfaction score of 81% (18). As mentioned previously, both these studies utilized a validated scale. These results are comparable to those studies that have utilized non-validated questionnaires. Bourne *et al*. (13) reported an overall satisfaction rate of 81% in his study that evaluated 1,375 patients 1 year following TKA. Similarly Scott *et al*. (26) reported a satisfaction rate of 81.4% in his study of 1,290 TKAs. While we have these figures to quote from studies performed on a predominantly Western population, there are no large-scale studies that have evaluated satisfaction rates on Asian patients undergoing TKA. With a different set of expectations, one might expect a slightly different satisfaction rate.

Determinants of satisfaction in total knee arthroplasty (TKA)

Age

Age of the patient undergoing TKA has always been implicated in patient satisfaction. Bourne *et al*. (13) suggested that increasing age was associated with a greater degree of dissatisfaction. This was also reported by Noble *et al*. (10), who concluded that patient satisfaction correlated significantly with age less than 60. However, Merle-Vincent *et al*. (14) found that an age of more than 70 correlated positively with patient satisfaction. To make the literature even more dubious, Scott *et al*. (26) and Gandhi *et al*. (27) found that there was no meaningful relationship between patient age and satisfaction. To date, the effect of age on patient satisfaction is still not clearly understood. Suffice to say, a fitter older person may tend to be more satisfied than a younger person with lesser reserves.

Gender

In a study by Kennedy *et al*. (28), it is reported that women showed greater disability than men in the physical performance and self-report measures. However, they utilized a non-validated measurement tool, the Lower Extremity Activity Profile. By and large, there are no other studies that have proven that the gender of the patient has an influence on patient satisfaction. In fact, it has been shown that gender does not seem to have an impact on patient satisfaction (10,27).

Expectations

Patients' expectations are fast emerging as an important parameter of assessment when studying patient satisfaction. The fulfillment of patients' expectations has been found to be highly correlated with patient satisfaction, as reported

by Scott *et al*. (29). In his study, 323 post-TKA patients completed an expectation questionnaire, Oxford score and SF-12 score pre-operatively. At 1 year post-operatively, the Oxford score, SF-12, patient satisfaction and expectation fulfillment were assessed. High fulfillment of expectation was significantly predicted by young age, greater improvements in Oxford score and high pre-operative mental health scores. Bourne *et al*. (13) reported that the most important contributing factor to dissatisfaction following TKA was not meeting patients' expectations. From these studies, it is apparent that patients' expectations of the outcomes of TKA have a significant bearing on patient satisfaction. The importance of managing patients' ideas, concerns and expectations pre-operatively at the clinic setting by the surgeon cannot be over-emphasized. The arthroplasty surgeon must be well versed with the cultural and social aspects of the patient care so that the expectations of the patients are better dealt with. Vissers *et al*. (30) conducted a systematic review of 35 studies which examined the impact of psychopathology and found that lower preoperative mental health was associated with lower self-reported patient outcomes.

Comorbidities

Comorbidities can be dichotomized further into psychological and medical comorbidities. The mental health of the patient undergoing TKA has been found to have an impact on patient satisfaction. In a recent study by Clement *et al*. (31), it is reported that poor mental health was associated with a diminished improvement in the Oxford knee score and increased the rate of dissatisfaction following TKA. This is also echoed by Ellis *et al*. (32) who conducted a study within an indigent population. He reported that psychopathology may result in lower satisfaction scores at 1 year following TKA. While it is very clear that mental comorbidities have a deleterious effect on patient satisfaction, the same cannot be said for the impact of medical comorbidities. Gandhi *et al*. (33) reported that there was medical comorbidities had no significant impact on patient satisfaction. Only Scott *et al*. (26) found that there as a minimal but statistically significant increase in dissatisfaction in patients with a higher mean number of medical comorbidities.

Primary diagnosis

Interestingly, Robertsson *et al*. (11) found that patients with a primary diagnosis of rheumatoid arthritis had a higher satisfaction rate as compared to patients with OA. He postulated this may be due to the fact that patients with rheumatoid arthritis may experience a greater amount of pain relief as compared to those with OA. This was also found by Bullens *et al*. (4) who cited the lower preoperative expectations of rheumatoid patients as the main reason for the higher satisfaction rate.

Range of motion

As mentioned previously, one would expect the Asian patient to be concerned with the amount of post operative range of motion and thereby affecting patient satisfaction. A study by Miner *et al*. (34) on Western patients found that post operative range of motion after 1 year was not associated with patient satisfaction. However, Seng *et al*. (35) reported improved patient satisfaction scores 5 years following high-flexion TKA on Asian patients. Indeed, this may be unique to the Asian TKA given the higher demands for flexion.

Symptoms

Unresolved pain following TKA has been consistently found to be a significant factor leading to patient dissatisfaction. Scott *et al*. (26) cited unresolved pain as the most important predictor of patient dissatisfaction following TKA. Similarly, Franklin *et al*. (36) also concluded that unresolved pain up to 1 year following TKA was associated with a higher dissatisfaction rate.

Components of satisfaction in total knee arthroplasty (TKA)

Type of anaesthesia

There is a lack of evidence with respect to anaesthetic techniques and their impact on patient satisfaction, mainly because most of these studies did not assess satisfaction scores. However, Thorsell *et al*. (37) did report that there were higher rates of satisfaction when comparing local infiltration with continuous epidural anaesthesia.

Minimally-invasive surgery (MIS)

A meta-analysis by Smith *et al*. (38) suggests that whilst incision length was significantly smaller in MIS and range of motion was significantly greater following MIS, there were

no statistically significant differences in all other clinical or radiological outcomes between MIS or conventional TKA. In another study, Hernandez-Vaquero *et al*. (39) found no statistically significant differences between MIS and conventional TKA with regards to the radiological alignment of the implant, range of motion, KSS scores, the SF-12 scores, patient's pain perception, satisfaction or subjective improvement. However, in an Asian study, Seon *et al*. (40) reported better WOMAC scores in patients who received a MIS TKA up to 9 months following surgery. In his study, he compared the clinical and radiological results achieved using MIS and conventional techniques in 42 bilateral TKA patients. This again adds strength to the argument that the Asian TKA may have to be approached differently.

Use of navigation

To date, the use of navigation does not seem to affect clinical outcomes and patient satisfaction. Burnett *et al*. (41) concluded that longer-term studies demonstrating improved function, lower revision rates, and acceptable costs are required before navigated TKA may be widely adopted as current literature is largely inconclusive. Even in the Asian literature, Venkatesan *et al*. (42) concluded that computer-assisted navigated knee arthroplasty provides some advantages over conventional surgery, but its clinical benefits to date are unclear and remain to be defined on a larger scale. In light of the current literature, we would think that the use of navigation does not affect patient satisfaction scores.

The way forward

Patient satisfaction without a doubt is an important outcome measure of TKA that has to be taken into consideration by all arthroplasty surgeons. TKA in the Asian population involves a few unique challenges especially with higher demands of post-operative flexion. Improving patient satisfaction following TKA is certainly a challenge, given the already high satisfaction rates. However, there is still that small population that remains dissatisfied. We need to channel our efforts to improve the satisfaction rates in these patients. The factors that we have discussed above all play very important roles in determining patient satisfaction. However, it is of utmost importance that the surgeon fully understands the patient's ideas, concerns and expectations pre-operatively. Proper per-operative education is essential in achieving good results post-TKA.

Summary

Patient satisfaction should be approached from two prongs—determinants of satisfaction and components of satisfaction. Patient satisfaction can be improved by modifying the elements from these two categories. Patient satisfaction is one of the PROMs used widely in orthopaedic surgery and is fast becoming an important tool to measure surgical outcomes. It is an essential modality of the patient-centred care that we all aim to provide.

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Footnote

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