

# Surgical Outcomes and Healthcare Experience in Spinal Surgery: Are They Related



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## Abstract

**Introduction:** Patient healthcare satisfaction and surgical outcome are two important measures. Their complex relationship has not been studied in spinal surgery and the question remains: Are patients with a good surgical outcome satisfied with their healthcare experience?

**Method:** Patients completed a validated Spine TANGO Core Outcome Measure Index (COMI) questionnaire at 3 months after surgery. Two questions assessing healthcare experience and surgical outcome, both graded from 1-5, were used to measure the two variables for each patient. Statistical analysis was completed to measure any relationship that may exist between the two indices.

**Results:** 3096 completed questionnaires were analysed. The results demonstrated a weak relationship (correlation coefficient = 0.34, kappa = 0.167)

**Conclusion:** A weak relationship exists between healthcare experience satisfaction and surgical outcome in spinal surgical patients.

**Keywords:** Surgical outcomes; Spine; TANGO; Patient reported outcome measures; PROMS

## Introduction

There is increasing recognition of the importance of patients' opinion of the quality of their care. In 2008, The Department of Health (DOH) of Her Majesty's Government (HMG) stated that quality of care in the NHS should include the following aspects: Patient safety, patient experience and clinical effectiveness [1]. It seems reasonable that these three domains are inter-related but the literature is unclear as to whether there is a relationship, and its nature, between surgical outcome and patient satisfaction.

Patient reported measures have been described as strongly correlated with better outcomes and capture patient evaluation of communication with nurses and physicians rather than non-care aspects [2,3]. However, critics express concerns about patient-reported measures, particularly those assessing "patient satisfaction." They state that patient feedback is not credible, as patients lack formal medical training, and are therefore not able to separate the different domains of healthcare. Following this viewpoint critics believe that patient-satisfaction measures capture an aspect of "happiness," which is influenced by factors unrelated to their hospital stay [4,5]. Given the associations between many spinal pathologies and personality traits and social and psychological inter-relationships, there is an even

stronger potential for this in spinal surgery [6,7]. As a result, our aim was to assess whether surgical outcome was related to patient satisfaction and a positive healthcare experience in spinal surgery.

## Materials and Method

Prospectively collected outcome data, Spine TANGO Core Outcome Measure Index (COMI) was utilised. This validated patient questionnaire is routinely collected for all spinal surgery at our institution and is collected at specific time points post-operatively. Analysis was performed upon the 3 month data, to enable accurate recall and reflection of patients' satisfaction with their healthcare experience. All patients undergoing spinal surgery, excluding therapeutic or diagnostic injections and manipulations are requested to complete the Spine TANGO COMI.

The questionnaire contains data relating to demographics, procedure, complications and outcomes. Two distinct COMI forms exist relating to back and neck surgery, but the questions remain the same except for the terms back and neck being interchanged.

**Outcome Data**

Within Spine TANGO there are two key questions, assessed by a rating scale, to ascertain surgical outcome and healthcare satisfaction. The question to ascertain surgical outcome: ‘Overall, how much did the operation in our hospital help your back/neck problem?’. Each answer is weighted from 1 being ‘very satisfied’ or ‘helped a lot’, to 5 being ‘very dissatisfied’ or ‘made things worse’. The second key question relates to healthcare satisfaction: ‘Over the course of treatment for your back/neck problem, how satisfied were you with your overall medical care in our hospital? This is also graded over five answers from ‘very satisfied’ to ‘very dissatisfied’. Corresponding answers for each patient were tabulated analysed.

**Data Analysis**

Data analysis was performed with SPSS (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.) to assess the correlation between two variables using the correlation coefficient, with no analysis of magnitude, direction or linearity of the correlation and the kappa coefficient.

**Results**

Over the study period a total of 6563 patients underwent surgery and were at least 3 months post-operative. Of these 6563 patients, 3505 replied with their three month COMI data, giving a response rate of 53%. Patients with incomplete data sets were excluded, leaving 3096 patients for statistical analysis (763 Neck COMI, 2333 Back COMI). The average age was 56 years with a slight male preponderance of 52%. 1490 patients (48%) were overweight, as defined by a BMI of greater than 25 (Table 1).

**Table 1:** Shows the number of patients answering for each of the 25 possible answer combinations.

Outcome	1 (Surgery helped a lot)	2	3	4	5 (Surgery made things worse)
1 (very satisfied)	1263	480	274	139	66
2	171	188	108	52	35
3	18	22	35	26	19
4	21	25	31	28	13
5 (very dissatisfied)	16	9	14	15	28

Overall patients were satisfied with their hospital experience, with 89.7% of patients scoring a 1 or 2 on the satisfaction rating scale, regardless of surgical outcome. The correlation coefficient between the two outcomes was 0.34 demonstrating weak correlation between the two variables. The kappa value was 0.167, again demonstrating only slight correlation [8]. The level of correlation was unaffected by gender, age, emergency or elective surgery, level of surgery or main pathology.

2796 (90%) patients left hospital with no complications.

There was no difference in the level of satisfaction experienced between patients with or without a complication, with 90% of patients being satisfied in each group. Types and numbers of peri-operative complications are displayed in (Table 2) (Intra-operative complications) and (Table 3) (Post-operative, pre-discharge complications).

**Table 2:** Intra-operative complications.

Complications	No. of patients
Intra operative	
Nerve root damage	0
Cord damage	2
Dural lesion	166
Vascular injury	1
Fracture	1
Other	17
Anaesthetic	3
Cardiovascular	5
Pulmonary	1
VTE	3
Death	0

**Table 3:** Post-operative, pre-discharge complications.

Post-operative, pre-discharge	
Epidural haematoma	3
Other haematoma	6
Radiculopathy	6
CSF leak	12
Motor dysfunction	18
Sensory dysfunction	10
Bowel/bladder dysfunction	8
Superficial wound infection	13
Deep wound infection	8
Implant malposition	7
Wrong level surgery	1
Other	14

**Discussion**

Most of the patients reported a positive hospital experience with 89.7% reporting they were very satisfied or satisfied, regardless of their surgical outcome. There was no difference in satisfaction between male and females, 89% and 90% respectively or between elective and emergency surgeries, 90% satisfaction. Interestingly those patients who had a complication also reported high levels of satisfaction, 90%.

The correlation coefficient and kappa score results show that there is only a very weak relationship between the overall healthcare experience of a patient and their spinal surgical

outcome, with results of 0.34 and 0.167 respectively. This is the first study that we are aware of in the UK which looks at the potential relationship between surgical outcome and healthcare experience as reported by the patient in spinal surgery. Previous research studies have looked at a range of non spinal medical conditions and demonstrate similar results to ours with a weakly positive relationship, with correlation coefficients ranging from 0.1-0.33 [9-13].

## Strengths and limitations

The strength of this study is the large, prospectively collected dataset, with over 3000 spinal surgery episodes available for analysis. The limitations are the response rate of 53%. Response to post-operative questionnaires vary dependent on gender, age, and socio-economic status [14,15] thus bias may be introduced secondary to this, although our data shows no difference in satisfaction scores dependent on gender and age.

## Conclusion

The statistical evidence of over 3000 patients within this study supports that there is only a weak relationship between patient experience and patient reported outcome following spinal surgery. This is an important finding when comparing surgical outcomes between units, surgeons or interventions. The result would suggest that the surgical outcome itself is largely unrelated to other factors that influence healthcare experience of the individual. These include the compassion of nursing staff and medical practitioners, amenities and cleanliness, organisation of procedures and anaesthetic information [16]. Therefore, surgical outcomes cannot be considered as the sole surrogate for the healthcare experience. Furthermore, it would seem justifiable to state that the healthcare experience cannot be considered a significant confounding factor, when comparing outcomes. These results contrast with those stated in the literature [16-18]. However, these involved a different patient group with none in their cohorts having undergone spinal surgery. The relationship, if it does exist, is likely to be complex [16].

As focus increases on publishing surgeon level data and the increasing use of patient reported outcomes, concerns have been raised by clinicians. This unease draws attention to the fact that patient reported measures may reflect the patients' overall level of satisfaction as opposed to the clinicians' effectiveness or safety [19]. This study does not support these concerns demonstrating only a weak relationship between experience and outcome which is unaffected by surgical complication. Furthermore, regulators and policy-makers believe that patient experience can be used as a surrogate for surgical outcome measures and that it is unnecessary to collect this additional data. This study confirms that patient experience cannot be used as a surrogate maker for surgical outcome and safety.

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