

# Patient-Reported Outcomes in Lumbar Spine Surgery

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## Abstract

**Introduction:** Lumbar spine spondylosis is a significant cause of morbidity worldwide. Surgical treatment is increasingly being used in patients who do not respond to conservative treatment. Although the outcome of these surgeries is subjective, patient-oriented questionnaires are considered to give a less biased assessment of surgical outcomes. The aim of this study was to use the Oswestry Disability Index (ODI) to assess the early outcome of lumbar spine surgery in patients with lumbar degenerative spine disease. **Methodology:** This was a retrospective study carried out over a period of one year, recruiting twenty patients who had lumbar spine surgeries (both instrumented and non-instrumented surgeries) for degenerative lumbar spine disease. **Results:** The age range of the subjects was 40–80 years, with a mean age of  $55.9 \pm 9.2$  years. A majority of the patients had lumbar disc prolapse (70%). There was a statistically significant correlation between preoperative ODI and postoperative ODI, with postoperative patients having a lower ODI score (which signifies improved outcome). **Conclusion:** Lumbar surgeries for degenerative lumbosacral spine disease lead to a high level of patient satisfaction.

**Keywords:** Decompression, instrumentation, Oswestry Disability Index

## INTRODUCTION

Degenerative disease of the lumbar spine is a major cause of morbidity worldwide. It includes spondylolisthesis, lumbar spine canal stenosis, and degenerative disc disease.<sup>[1]</sup> Although there are several modalities of treatment, the end goals are to improve the patients' quality of life and restore pre-morbid functions. Operative intervention may be indicated in patients who fail to respond to conservative treatment, and when indicated, are usually dependent upon the relationship between clinical symptoms and radiological investigations. However, different studies have shown that there is an insignificant correlation between radiological tests and the severity of the clinical symptoms from the patient's perspective.<sup>[1,2]</sup>

Surgical outcomes have been noted to be subjective, depending on how success is assessed.<sup>[3]</sup> Patient-dependent questionnaires have become more available, and are increasingly being used to assess the outcome of treatment, as they provide less bias than surgeon-based ratings.<sup>[4]</sup> Surgeon-based ratings are usually more subjective, as they rely fully on the surgeon's clinical acumen to rate the outcome of the procedure. However, both surgeon-based ratings and the results of postoperative imaging exams have shown little correlation with patient satisfaction.<sup>[1,5]</sup> Patient-reported outcomes (PRO) are clinical

status reports that are obtained directly from patients without any interference by clinicians.<sup>[6]</sup> PRO instruments provide its outcomes as numerical scores, giving room for comparing both the pre- and post-operative parameters to detect differences. It is therefore a useful tool in the detection of effective clinical treatment. There is a variety of patient-directed questionnaires available, and it is critical that the appropriate assessment tool is chosen.

The Oswestry Disability Index (ODI) is the assessment tool most commonly used in lumbar spondylosis.<sup>[7]</sup> It consists of 10 questions, with each of these questions having six possible answers. These answer stems have values ranging from 0 to 5 and the maximum total score is 100. If a patient has a score of 0–20, this indicates minimal disability, 21–40 indicates moderate disability, 41–60 indicates severe disability, 61–80 indicates that these group of patients are crippled, and 81–100 indicates a patient that is bed bound or exaggerating their symptoms.<sup>[8]</sup>

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Other scales that can be used include the Japanese Orthopaedic Association Back Pain Evaluation Questionnaire<sup>[9]</sup> and the Core Outcome Measurement Index.<sup>[10]</sup> Although there has been a rapid rise in health care expenditure related to the treatment of disorders of the spine including instrumented and non-instrumented spine surgeries, few studies have sought to determine the outcome of lumbar spine surgery using patient-dependent measures.

This index study was done to ascertain early PRO after lumbar spine surgery for degenerative lumbosacral conditions using the Oswestry disability scoring system.

### METHODOLOGY

This was a retrospective study carried out at our institution. Patients who had instrumented and non-instrumented lumbar spine surgeries for degenerative lumbosacral spine pathologies were recruited into this study. Data were collected from all patients who fell into the inclusion criteria including biodata, preoperative, early/late postoperative ODI, magnetic resonance imaging findings/diagnosis.

Exclusion criteria included patients who had non-operative intervention done (including epidural steroid injection). It was a 1-year study period; from January 2018 to January 2019. Twenty patients were recruited for this study.

### RESULTS

A majority of the patients had multi-level disc prolapse (70%).

Table 1 shows the sex distribution of patients from this study. The most common age group involved in this study was 41-60 years [Table 2]. Figure 1 shows the diagnosis of the subjects.

Table 3 shows that the most common score band preoperatively was 61-80 (crippled). Table 4 shows that the most common score band is 21-40 (moderate disability).

Table 5 shows that the most common score band is 0-20 (minimal disability). Table 6 shows Spearman's rho correlation test between the pre- and post-operative ODI. This shows a statistically significant correlation between preoperative ODI scores and postoperative ODI score at six months. It also shows a statistically significant correlation between postoperative ODI scores at one week and six months.

### DISCUSSION

There is limited research evaluating patient satisfaction as an outcome measure following spine surgeries in Nigeria. This index study evaluates early outcomes post spine surgery for degenerative lumbosacral spine disease.

Degenerative lumbar spine disease has been found to be directly correlated with increased patients' age, especially with regard to disc degeneration.<sup>[11]</sup> Men have been noted to develop disc degeneration earlier than their female counterparts.<sup>[11]</sup> In this study, there were more males than females, though this was not statistically significant. In addition, the most

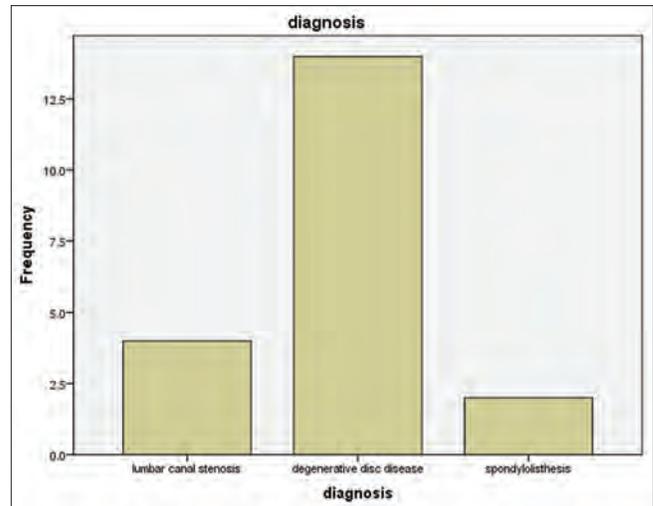


Figure 1: Diagnosis of patients

Table 1: Sex distribution of patients

	Frequency (%)
Male	11 (55)
Female	9 (45)
Total	20 (100)

Although there were more males recruited in this study, this was not statistically significant ( $P < 0.05$ )

Table 2: Age distribution of patients

	Frequency (%)
41-50	6 (30)
51-60	6 (30)
61-70	7 (35)
71-80	1 (5)
Total	20 (100)

The age range of the subjects was 40-80 years, with a mean age of  $55.9 \pm 9.2$ . The most common age range was 41-60 years. Mean age of the subjects

Table 3: Oswestry score of patients preoperatively

Score	Frequency (%)
Minimal (0-20)	-
Moderate (21-40)	-
Severe (41-60)	6 (30)
Crippled (61-80)	11 (55)
Bed bound (81-100)	3 (15)

commonly affected age group in this study was 41-60 years, with a mean age of  $55.9 \pm 9.2$ . In a study by Francis<sup>[12]</sup> which sought to determine the radiographic prevalence of lumbar spondylosis in Nigeria, a mean age of 51.96 years was found (with the age range of the recruited subjects being 17-90 years). Most of the patients in this study by Francis<sup>[12]</sup> were aged between 45-65 years.

In this index study, a majority of patients with degenerative lumbosacral spine disease had degenerative disc disease (70%).

**Table 4: Oswestry score of patients 1 week postoperatively**

Score	Frequency (%)
Minimal (0-20)	1 (5)
Moderate (21-40)	12 (60)
Severe (41-60)	6 (30)
Crippled (61-80)	1 (5)
Bed bound (81-100)	-

**Table 5: Oswestry score 6 months postoperatively**

Score (0-100)	Frequency (%)
Minimal (0-20)	14 (70)
Moderate (21-40)	5 (25)
Severe (41-60)	1 (5)
Crippled (61-80)	0
Bed bound (81-100)	0

**Table 6: Correlation of Oswestry scores pre- and post-operatively**

	<i>n</i>	Core value ( <i>r<sub>s</sub></i> )	<i>P</i>
Preoperative versus one week postoperative	20	-0.015	0.950
One week postoperative versus 6 months postoperative	20	0.685	0.001*
Preoperative versus 6 months postoperative	20	0.625	0.001*

\*Correlation is significant when  $P < 0.01$

This is in keeping with findings from other studies, including that by Ravindra *et al.*<sup>[13]</sup> where the authors estimated a worldwide incidence of degenerative lumbar spine disease with a majority of patients (73%) having degenerative conditions involving the discs, while 18% had lumbar canal stenosis and 7% had spondylolisthesis.

In this index study, patient satisfaction was assessed using ODI, and the preoperative score was thereafter compared to the postoperative score at one week, and then at six months. Preoperatively, no patient was satisfied with their symptoms. At the first postoperative week, 13 patients (65%) were satisfied, while at six months, 19 patients (95%) were satisfied with their postoperative condition. When this was compared to their ODI in the preoperative period, it was found to be statistically significant. Similar studies have also used patient contentment to measure outcomes following lumbar spine surgeries. In a study done by McGregor *et al.*,<sup>[14]</sup> they found a high level of patient satisfaction post spine surgery, although patients who had discectomy were more satisfied than patients who had decompression.

In a similar study done by Soroceanu *et al.*,<sup>[15]</sup> a high level of patient satisfaction was found after lumbar surgeries, although patients who had cervical surgeries had a better functional outcome.

However, it has been argued that patient satisfaction may vary depending on the preoperative expectations of the patient, with more realistic patient expectations leading to a more satisfied patient when compared to their unrealistic counterparts.

A study done by Mancuso *et al.*,<sup>[16]</sup> found out that patients who had sky-high expectations following lumbar and cervical spine surgeries were less satisfied postoperatively. In contrast, McGregor *et al.*<sup>[14]</sup> found patient satisfaction to be fairly constant and independent of patients' expectations postoperatively.

## CONCLUSION

Lumbar surgeries for degenerative lumbosacral spine disease lead to a high level of patient satisfaction.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Djurasovic M, Carreon LY, Crawford CH 3<sup>rd</sup>, Zook JD, Bratcher KR, Glassman SD. The influence of preoperative MRI findings on lumbar fusion clinical outcomes. *Eur Spine J* 2012;21:1616-23.
- Goni VG, Hampannavar A, Gopinathan NR, Singh P, Sudesh P, Logithasan RK, *et al.* Comparison of the Oswestry Disability Index and magnetic resonance imaging findings in lumbar canal stenosis: An observational study. *Asian Spine J* 2014;8:44-50.
- Chapman JR, Norvell DC, Hermsmeyer JT, Bransford RJ, DeVine J, McGirt MJ, *et al.* Evaluating common outcomes for measuring treatment success for chronic low back pain. *Spine (Phila Pa 1976)* 2011;36:S54-68.
- Lattig F, Grob D, Kleinstueck FS, Porchet F, Jeszenszky D, Bartanusz V, *et al.* Ratings of global outcome at the first post-operative assessment after spinal surgery: How often do the surgeon and patient agree? *Eur Spine J* 2009;18 Suppl 3:386-94.
- Haefeli M, Elfering A, Aebi M, Freeman BJ, Fritzell P, Guimaraes Consciencia J, *et al.* What comprises a good outcome in spinal surgery? A preliminary survey among spine surgeons of the SSE and European spine patients. *Eur Spine J* 2008;17:104-16.
- Greenhalgh J. The applications of PROs in clinical practice: What are they, do they work, and why? *Qual Life Res* 2009;18:115-23.
- Fairbank JC. Why are there different versions of the Oswestry Disability Index? *J Neurosurg Spine* 2014;20:83-6.
- Fairbank JC, Pynsent PB. The Oswestry Disability Index. *Spine (Phila Pa 1976)* 2000;25:2940-52.
- Azimi P, Shahzadi S, Montazeri A. The Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ) for low back disorders: A validation study from Iran. *J Orthop Sci* 2012;17:521-5.
- Mohammadi HR, Azimi P, Zali A, Montazeri A. An outcome measure of functionality and pain in patients with low back disorder: A validation study of the Iranian version of Core Outcome Measures Index. *Asian J Neurosurg* 2015;10:46.
- Siemionow K, An H, Cs-Szabo G. The effects of age, gender, ethnicity and spinal level on the rate of intervertebral disc degeneration. A review of 1712 intervertebral discs. *Spine (Phila Pa 1976)* 2011;36:1333-9.
- Francis OO. Radiographic lumbar spondylosis. Gender and age group prevalence in Nigeria. *Ann Trop Med Public Health* 2017;10:199-204.
- Ravindra VM, Senglaub SS, Rattani A, Dewan MC, Härtl R, Bisson E, *et al.* Degenerative lumbar spine disease: Estimating Global Incidence and Worldwide Volume. *Global Spine J* 2018;8:784-94.
- McGregor AH, Doré CJ, Morris TP. An exploration of patients' expectation of and satisfaction with surgical outcome. *Eur Spine J* 2013;22:2836-44.
- Soroceanu A, Ching A, Abdu W, McGuire K. Relationship between preoperative expectations, satisfaction, and functional outcomes in patients undergoing lumbar and cervical spine surgery: A multicenter study. *Spine (Phila Pa 1976)* 2012;37:E103-8.
- Mancuso CA, Reid MC, Duculan R, Girardi FP. Improvement in pain after lumbar spine surgery: The role of preoperative expectations of pain relief. *Clin J Pain* 2017;33:93-8.