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Research

# Determinants of Surgeon and Center Selection in Recurrent Lumbar Disc Herniation: A Survey-Based Analysis of Patient Decision-Making

## Nüks Lomber Disk Hernisinde Merkez ve Cerrah Değişimi: Hasta Tercihlerini Belirleyen Etkenler Üzerine Anket Temelli Bir Araştırma

İlhan Aydın[1], Ahmed Rasim Bayramoğlu[1], Berkay Kef[2], Melih Üçer[2], Orhun Mete Çevik[1], Uzay Erdoğan[1], Hasan Burak Gündüz[1], Erhan Emel[1]

[1]University of Health Sciences Türkiye, Bakırköy Prof. Dr. Mazhar Osman Mental Health and Neurological Diseases Training and Research Hospital, Clinic of Neurosurgery, İstanbul, Türkiye

[2]Biruni University Faculty of Medicine, Department of Neurosurgery, İstanbul, Türkiye

## ABSTRACT

**Objective:** To investigate factors influencing patients' selection of surgeon and treatment center for revision surgery for recurrent lumbar disc herniation in Türkiye. Understanding the motivations behind changing providers after primary spinal surgery is crucial for enhancing continuity of care and informing health policy within mixed healthcare systems.

**Methods:** This cross-sectional observational study was conducted at a tertiary neurosurgery center in İstanbul. Forty patients who had previously undergone lumbar discectomy and subsequently required revision surgery were interviewed via structured telephone questionnaires. Patients were asked about their reasons for changing surgeons or institutions, their satisfaction with their initial surgery, and whether they had contacted their index surgeon following recurrence. Descriptive statistics were used to analyze response frequencies. Additionally, two-proportion z-tests were used to compare key findings against data from the landmark international literature.

**Results:** The most common reasons for changing providers were seeking a second opinion (45%), dissatisfaction with prior care (30%), and financial barriers (35%). All 14 patients who had initially undergone surgery in private hospitals opted for revision in public institutions, citing cost concerns. Despite 70% of patients reporting satisfaction with their index surgery, only 35% reconsulted their original surgeon after recurrence of symptoms. A minority (10%) deliberately avoided their initial provider despite having access. Furthermore, the proportion of patients who did not reconsult their index surgeon (65%) was significantly higher than that reported in benchmark United States of America studies (p=0.017).

**Conclusion:** Although patient satisfaction with initial surgery was generally high, provider change was frequently driven by economic pressures and informational needs, rather than geographic relocation or outright dissatisfaction. These findings underscore the importance of transparent preoperative counseling and cost awareness, particularly in mixed public-private systems like Türkiye's. Future research should evaluate the impact of provider continuity on revision outcomes and explore strategies to support equitable access to complex spinal care.

**Keywords:** Choice behavior, continuity of patient care, disc herniation, health services accessibility, patient satisfaction, recurrence, reoperation, second opinion, Türkiye

## ÖZ

**Amaç:** Bu çalışma, Türkiye'de nüks lomber disk hernisi nedeniyle revizyon cerrahisi geçiren hastalarda cerrah ve sağlık merkezi tercihini etkileyen faktörleri araştırmayı amaçlamaktadır. Primer spinal cerrahi sonrası sağlık hizmeti sağlayıcısı değişiminin altında yatan motivasyonların anlaşılması, bakım sürekliliğinin güçlendirilmesi ve karma sağlık sistemlerinde sağlık politikalarının geliştirilmesi açısından önem taşımaktadır.

**Gereç ve Yöntem:** Bu kesitsel gözlemsel çalışma, İstanbul'daki üçüncü basamak bir beyin cerrahisi merkezinde yürütülmüştür. Daha önce lomber diskektomi uygulanmış ve sonrasında revizyon cerrahisine ihtiyaç duyan 40 hasta ile yapılandırılmış telefon anketleri aracılığıyla görüşülmüştür. Hastalara cerrah ya da kurum değiştirme nedenleri, ilk cerrahilerine ilişkin memnuniyet düzeyleri ve nüks sonrası bu cerrahla yeniden iletişime geçip geçmedikleri sorulmuştur. Yanıt frekansları tanımlayıcı istatistiklerle analiz edilmiş; ayrıca bazı temel bulgular, uluslararası literatürdeki referans verilerle iki oran z-testleri kullanılarak karşılaştırılmıştır.

**Address for Correspondence:** İlhan Aydın, MD, University of Health Sciences Türkiye, Bakırköy Prof. Dr. Mazhar Osman Mental Health and Neurological Diseases Training and Research Hospital, Clinic of Neurosurgery, İstanbul, Türkiye
**E-mail:** ilhanaydinmd@gmail.com **ORCID ID:** orcid.org/0000-0001-7681-8528

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## ÖZ

**Bulgular:** Sağlık hizmeti sağlayıcısı değişikliğinin en sık gerekçeleri ikinci görüş alma isteği (%45), önceki bakımdan memnuniyetsizlik (%30) ve finansal engeller (%35) olarak belirlenmiştir. Başlangıçta özel hastanelerde ameliyat olan 14 hastanın tamamı, revizyon cerrahisini kamu hastanelerinde yaptırmayı tercih etmiş ve bu kararı maliyet gerekçesiyle aldıklarını belirtmiştir. Hastaların %70'i ilk cerrahilerinden memnun olduklarını ifade etmesine rağmen, yalnızca %35'i semptomların yinelenmesinden sonra ilk cerrahlarına yeniden başvurmuştur. Erişim imkanı olmasına rağmen %10'luk bir kesim, önceki cerrahlarını bilinçli olarak tercih etmemiştir. İlk cerrahına yeniden başvurmayan hastaların oranı (%65), benzer Amerika Birleşik Devletleri kaynaklı çalışmalarda bildirilen oranlara kıyasla anlamlı ölçüde yüksektir (p=0,017).

**Sonuç:** Hastaların ilk cerrahiye yönelik memnuniyet düzeyi genel olarak yüksek olmakla birlikte, sağlık hizmeti sağlayıcısı değişimi çoğunlukla ekonomik nedenler ve bilgi edinme ihtiyacı ile ilişkilidir; coğrafi nedenler veya doğrudan memnuniyetsizlik daha az etkili görünmektedir. Bu bulgular, kamu-özel dengesine dayalı sağlık sistemlerinde, özellikle maliyet konusunda şeffaf bilgilendirme ve etkili preoperatif danışmanlığın önemine işaret etmektedir. Gelecek çalışmalar, sağlık hizmeti sağlayıcısı sürekliliğinin revizyon cerrahisi sonuçlarına etkisini değerlendirmeli ve kompleks spinal bakım hizmetlerine adil erişimi destekleyici stratejiler geliştirmelidir.


**Anahtar Kelimeler:** Tercih davranışı, hasta bakımının sürekliliği, disk hernisi, sağlık hizmetlerine erişim, hasta memnuniyeti, nüks, yeniden cerrahi, ikinci görüş, Türkiye

## INTRODUCTION

Lumbar disc herniation is among the most frequently encountered degenerative spinal disorders, and surgical discectomy remains a well-established treatment for patients with persistent radiculopathy unresponsive to conservative measures. Despite the generally favorable outcomes of lumbar discectomy, recurrence rates have been reported between 5% and 15%, often requiring reoperation. In such cases, patients face complex decisions about whether to return to their original surgeon or to seek care from a different provider or institution (1,2).

Patient choice in recurrent spinal surgery is multifactorial and may be influenced by prior satisfaction with the initial surgery, trust in the surgeon, accessibility, institutional reputation, and even social or geographic mobility. In the setting of recurrent lumbar disc herniation, where surgical outcomes are less predictable and patient expectations are shaped by previous experiences, these decisions gain particular importance. Understanding the determinants of such preferences can offer valuable insights into the dynamics of surgeon-patient relationships and the broader delivery of spinal care (3-5).

While patient attrition during long-term follow-up is often assumed to reflect dissatisfaction with prior care, emerging evidence suggests that logistical and systemic factors—such as relocation, insurance compatibility, or referral patterns—may play a more prominent role. However, there is a paucity of data on these preferences in the context of revision lumbar surgery, particularly in countries with centralized health systems and limited availability of multidisciplinary spine units (6,7).

The objective of this study is to investigate the factors influencing selection of surgeon and center among patients undergoing surgery for recurrent lumbar disc herniation. Using a structured, telephone-administered questionnaire, we aim to assess the relative impact of satisfaction, communication, accessibility, and institutional variables on patient decision-making. Through this inquiry, we seek to contribute to a better understanding of patient behavior in the context of revision spine surgery and to inform strategies for optimizing continuity of care.

## METHODS

### Study Design and Setting

This observational, cross-sectional study was conducted at the Department of Neurosurgery of a tertiary care referral center in İstanbul, Türkiye. The study was approved by the University of Health Sciences Türkiye, Bakırköy Dr. Sadi Konuk Training and Research Hospital Non-Interventional Scientific Research Ethics Committee (approval no: 2025-10-03, date: 21.05.2025), and all procedures were carried out in accordance with the Declaration of Helsinki and national regulations on human subject research.

### Patient Selection

Patients who underwent lumbar spine surgery between September 1, 2015, and September 1, 2024, and were subsequently diagnosed with recurrent lumbar disc herniation were retrospectively identified from hospital records. Eligibility criteria included age ≥18 years, a prior lumbar discectomy, and either reoperation for recurrence or consultation for recurrent symptoms. Patients were contacted via telephone, and those who provided verbal informed consent were included in the study. Exclusion criteria were: incomplete medical history, inability to establish communication, refusal to participate, or severe neurological deficits impairing communication.

### Data Collection

A structured questionnaire was administered via telephone interviews between May and June 2025. The questionnaire included items regarding demographic data, initial and

revision surgery details, satisfaction with the index surgeon, reasons for seeking a different surgeon or institution, communication history with the initial provider, and preferences related to healthcare institution type (public, university, private).

The questionnaire was developed by adapting items from instruments used in similar studies (6-8). The final draft was then reviewed by two independent spine surgeons for content validity, clarity, and relevance.

### Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies (n) and percentages (%), were used to summarize all patient-related data and questionnaire responses. To compare key proportions in our cohort with those reported in previous studies, a two-proportion z-test was used (7). A p-value of $<0.05$ was considered statistically significant.

## RESULTS

Forty patients who underwent revision surgery for recurrent lumbar disc herniation completed the telephone-based questionnaire. Since all patients had previously undergone lumbar discectomy, spinal level and surgical type were not included as variables. Baseline characteristics of the index surgeons and institutions are summarized in Table 1.

Patients were asked about their reasons for not consulting the same surgeon again. The most commonly reported factors were seeking a second opinion (45.0%) and dissatisfaction with prior care (30.0%). In addition, 14 patients (35.0%) reported financial constraints, citing high costs in private hospitals as the reason they chose to undergo surgery in a public hospital. Multiple responses were allowed (Table 2).

Contact patterns and satisfaction outcomes are summarized in Table 3. Only 14 patients (35.0%) discussed their new symptoms with their original surgeon. Of the 26 who did not, four (10.0% of the total sample) had the opportunity to return but consciously chose not to return.

**Table 1.** Index-surgery characteristics (n=40)

| Variable | Category | n | % |
|---|---|---|---|
| **Specialty of index surgeon** | Neurosurgery | 35 | 87.5 |
| | Orthopaedics | 5 | 12.5 |
| **Institution where surgery was performed** | Private hospital | 20 | 50.0 |
| | Tertiary training/research hospital | 12 | 30.0 |
| | Secondary-level public hospital | 6 | 15.0 |
| | University hospital | 2 | 5.0 |

Despite half of the cohort initially received surgery in private hospitals, financial concerns emerged as a major determinant of subsequent surgeon preference. While dissatisfaction and the desire for a second opinion were common, 70% of patients reported being satisfied with their original surgical care and expressed a willingness to undergo the same operation again (Table 3). These findings suggest that changes of surgeon or treatment center in recurrent disc surgery are not solely due to negative experiences, but are shaped by multifactorial considerations, including cost, access, and evolving trust dynamics.

## DISCUSSION

This study investigated why patients undergoing revision lumbar discectomy did not return to their original surgeons for follow-up care or reoperation. Although the majority expressed satisfaction with their initial surgical outcomes, more than half of the cohort sought consultation with a different surgeon for the recurrent episode. The most commonly cited reasons were dissatisfaction with prior care, desire for a second opinion, and financial barriers associated with reoperation in the private sector. Notably, even among patients who had access to their original surgeons, some deliberately changed providers, indicating that practical access alone does not ensure continuity of care. These findings highlight a critical gap between patient experience and provider continuity in the context of recurrent spinal

**Table 2.** Patient-reported reasons for not returning to the index surgeon (n=40)

| Reason | n | % |
|---|---|---|
| Seeking a second opinion | 18 | 45.0 |
| Dissatisfaction with previous care | 12 | 30.0 |
| Surgeon no longer practiced in the area | 5 | 12.5 |
| Patient had relocated | 5 | 12.5 |
| Told a more complex operation was required | 4 | 10.0 |
| Other* | 14 | 35.0 |

*: All 14 patients underwent surgery in private hospitals and were subsequently transferred to public care for revision surgery because of high out-of-pocket costs

**Table 3.** Follow-up behavior and patient satisfaction (n=40)

| Outcome | n | % |
|---|---|---|
| Contacted original surgeon regarding new symptoms | 14 | 35.0% |
| Did not contact original surgeon | 26 | 65.0% |
| Of whom actively chose not to return despite access | 4 | 10.0% |
| Satisfied with prior surgical care | 28 | 70.0% |
| Would undergo the same procedure again for same outcome | 28 | 70.0% |

surgery, emphasizing the multifactorial nature of surgical loyalty and decision-making.

Patients' decisions to change surgeons despite access to their original providers are consistent with prior literature highlighting the complexity of follow-up behavior in spine care. In the landmark study by Daffner et al. (7), approximately 46% of patients did not contact their original surgeon upon experiencing new symptoms, and only 4% consciously chose not to return despite having the opportunity. In contrast, our study found both a significantly higher rate of patients who did not reconsult their index surgeon (65% vs. 46.4%; z=2.39, p=0.017) and a greater proportion of patients who actively avoided follow-up (10% vs. 4%). This suggests a higher rate of intentional provider change in our setting, possibly influenced by contextual factors such as the healthcare structure or cultural expectations. Moreover, while Daffner et al. (7) reported that 71% of patients were satisfied with their previous care, we found a nearly identical satisfaction rate (70%), indicating that switching surgeons is not always driven by dissatisfaction alone. Rather, as seen in both cohorts, second-opinion seeking emerged as a major driver. Although the rate of second-opinion seeking was notably higher in our cohort, the difference was not statistically significant compared with Daffner's study (45.0% vs. 31.9%; z=1.37, p=0.17) (7). This finding aligns with evidence from a recent scoping review that second opinions in spine surgery are both frequent and often discordant with initial recommendations. Such discrepancies can erode the trust in the original treatment plan and influence patient loyalty (7,8).

The reasons for this discordance are multifactorial. For example, in one study, 61.3% of patients who were initially recommended surgery for lumbar disc herniation received a different treatment plan upon seeking a second opinion, and 75% of these were advised to pursue non-surgical options (8). This highlights not only the variability in treatment approaches among spine surgeons but also the potential for subjective interpretation of patient expectations and clinical presentations. In particular, when a patient initially advised to undergo surgery is later recommended for conservative management, it can lead to confusion and diminished trust in the healthcare system. These conflicting recommendations significantly shape patient preferences: some patients opt for a more invasive approach, while others choose a more cautious path to avoid potential complications. Therefore, second opinions in spine surgery should be understood as influencing not only treatment decisions but also patient satisfaction, outcome expectations, and adherence to long-term follow-up.

Beyond individual satisfaction, patients' decisions were strongly influenced by structural factors related to the healthcare system. In our cohort, 35% of patients reported switching providers, primarily due to the high cost of reoperation in the private sector, despite having undergone their initial surgery in the private sector. There was a strong association between undergoing the index surgery in a private hospital and citing "financial constraints" as the primary reason for changing the surgeon ($p<0.001$). This behavior reflects a broader tendency in Türkiye's hybrid health system, where publicly insured patients can access both public and contracted private hospitals, yet may face substantial out-of-pocket expenses for complex or repeat procedures. The Health Transformation Program implemented in Türkiye over the past two decades has increased patient mobility and choice, allowing individuals to change providers with fewer bureaucratic barriers. However, this flexibility also leads to fragmentation of follow-up care, especially when provider continuity is deprioritized in favor of logistical convenience or financial necessity. Previous research suggests that although patient choice is formally guaranteed, true informed decision-making is limited by disparities in information availability and the uneven distribution of specialized services . In our setting, patients who initially received care in the private sector often sought revision in public hospitals due to affordability and perceived comprehensiveness of state-funded care. This aligns with studies showing that Turkish patients often rely on informal sources such as social networks and physician reputation when navigating between sectors. Thus, accessibility in Türkiye is not merely a matter of geographic proximity, but also of systemic financial pathways and perceptions of institutional trustworthiness (9).

Notably, although 70% of patients in our study reported satisfaction with their initial surgery and indicated they would undergo the same procedure again under similar circumstances, a substantial proportion nevertheless chose not to return to their original surgeon. This apparent paradox highlights the nuanced interplay between technical satisfaction and relational trust. As previous reviews have emphasized, fulfillment of patient expectations is a more reliable predictor of satisfaction than objective surgical outcomes alone. Even when clinical results are acceptable, dissatisfaction may arise from unmet expectations, perceived lack of empathy, or poor communication. In fact, one systematic review concluded that patients who experienced a mismatch between their expectations and outcomes were more likely to report dissatisfaction even if their symptoms improved. Changing surgeons may not necessarily reflect a negative surgical result but rather a

rupture in the therapeutic alliance. Our findings support this view, as some patients expressed overall satisfaction with the surgical outcome yet described feeling "ignored" or "unimportant" during postoperative follow-up. This aligns with studies showing that interpersonal aspects of care—such as perceived respect, attentiveness, and clarity—strongly influence long-term trust and provider loyalty. In surgical disciplines like spine surgery, where treatment decisions are preference-sensitive and recovery is often prolonged, the strength of the patient-surgeon relationship may be as critical as technical proficiency. Failure to maintain open, trust-based communication may lead even clinically successful patients to seek future care elsewhere (5,10-15).

This study has several strengths. It addresses an understudied area in spinal surgery—patient preferences and behavior in the setting of revision lumbar discectomy—through real-world data obtained from direct patient contact. Unlike registry-based or chart-review studies, our structured telephone interviews enabled us to capture patient perspectives, motivations, and values that may not be documented in routine clinical records. Furthermore, the homogeneity of the surgical indication (recurrent lumbar disc herniation) lends specificity to the findings, reducing confounding by diagnosis type. The inclusion of patients from both private and public healthcare settings enhances the generalizability of our findings across the Turkish health system.

### Study Limitations

Nonetheless, several limitations must be acknowledged. First, the relatively small sample size (n=40) reduces statistical power and may limit detection of subtle associations between demographic variables and decision patterns. Second, the study design was retrospective and survey-based, making it susceptible to recall bias, especially regarding patients' perceptions of prior care and interactions with surgeons. Third, because all data were self-reported, social desirability bias may have influenced responses some participants may have understated dissatisfaction or overemphasized rational decision-making. Additionally, we did not formally assess patient literacy, psychological status, or cultural background, all of which are known to affect healthcare preferences and trust. Lastly, the results are drawn from a single tertiary center, which may limit external validity, particularly for rural or lower-resource settings.

Despite these limitations, our findings offer valuable insights into patient behavior following recurrent disc herniation surgery and suggest actionable strategies to improve continuity of care and patient-centered decision-making.

In summary, our findings underscore that surgeon and center preferences following recurrent lumbar disc herniation are shaped not solely by clinical outcomes but by a complex interplay of patient expectations, communication quality, system-level accessibility, and cultural norms. Even in the presence of postoperative satisfaction, lapses in relational trust or logistical barriers can lead patients to seek care elsewhere. Addressing these multifactorial influences through improved expectation management, strengthened follow-up protocols, and a more transparent, integrated healthcare system may enhance continuity of care and reinforce long-term patient-surgeon relationships in spinal practice.

## CONCLUSION

This study highlights the multifactorial nature of surgeon and center preferences among patients undergoing revision surgery for recurrent lumbar disc herniation in Türkiye. Despite a high satisfaction rate with their initial operation, a substantial proportion of patients opted to change providers due to seeking second opinions, a perceived need for specialized expertise, and financial constraints, particularly among those initially treated in private hospitals.

These findings suggest that patient satisfaction alone is not a reliable predictor of continuity with the index surgeon, especially in the context of recurrent disease and system-level cost barriers. Financial accessibility and transparent communication about recurrence risks should be emphasized during preoperative counseling. Additionally, the limitations of the private sector in providing long-term continuity of care for complex cases warrant further investigation within Türkiye's healthcare system.

Future research should incorporate clinical outcomes and economic evaluations to better understand how changes in provider affect revision surgery outcomes and to support more equitable spine care planning across public and private sectors.

### ETHICS

**Ethics Committee Approval:** The study was approved by the University of Health Sciences Türkiye, Bakırköy Dr. Sadi Konuk Training and Research Hospital Non-Interventional Scientific Research Ethics Committee (approval no: 2025-10-03, date: 21.05.2025).

**Informed Consent:** Patients were contacted via telephone, and those who provided verbal informed consent were included in the study.

## FOOTNOTES

### Authorship Contributions

Surgical and Medical Practices: İ.A., M.Ü., O.M.Ç., U.E., H.B.G., E.E., Concept: İ.A., B.K., A.R.B., U.E., Design: İ.A., B.K., A.R.B., H.B.G., Data Collection or Processing: İ.A., M.Ü., O.M.Ç., U.E., H.B.G., E.E., Analysis or Interpretation: İ.A., A.R.B., M.Ü., E.E., Literature Search: İ.A., B.K., Writing: İ.A., A.R.B., B.K., M.Ü., O.M.Ç., U.E., H.B.G., E.E.

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