

# Profile of Lumbar Spinal Canal Stenosis at Prof. Dr. I.G.N.G Ngoerah Central General Hospital from Period of January 2021-December 2022

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## ABSTRACT

**Background:** Lumbar spinal canal stenosis is a narrowing of the spinal canal specifically in the lumbar region, this condition leads to lower back pain or even numbness or pain in the lower extremity due to compression of the nervous system or blood vessels. Its prevalence is increasing with age and is a common reason for surgeries in older people. This study aims to provide the profile of lumbar spinal canal stenosis at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, Bali, Indonesia, between 2021 and 2022.

**Materials and Methods:** This research is a descriptive study, using total sampling as the sampling method, which included all the 84 participants who met our inclusion criteria between January 2021 to December 2022. The data was collected through the medical records of patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital. The collected data was processed and analyzed using the frequencies descriptive statistics. The profile of the study was observed based on age group, gender, body mass index, pathoanatomy site, and treatment.

**Results:** The prevalence of this disease is mostly found in the age group of 50-59 years old, namely 40.5% of all participants. Based on gender, 56% of participants were male and the rest of them were females. Most of the participants have normal body mass index, up to 59.5% of the participants. Regarding the pathoanatomy site, 71.4% have lumbar spinal canal stenosis on multiple sites. It is shown that 92.9% of the participants got an operative treatment.

**Keywords:** Lumbar spinal canal stenosis, lower back pain, degenerative disease

## INTRODUCTION

Spinal stenosis is a narrowing of the spinal canal. While spinal stenosis can occur anywhere along the spinal column, the lumbar region is where it most frequently occurs.<sup>[1]</sup> Although lumbar spinal canal stenosis can develop as a person grows and matures or be a congenital condition from birth (primary stenosis), it is typically a degenerative condition that affects the elderly (secondary or acquired stenosis).<sup>[2,3]</sup> It is becoming more common as people age and is the most common indication for lumbar spine surgery for the elderly.<sup>[4]</sup> Diagnosis can be obtained from symptoms that appear, physical examination, medical records, and imaging modalities. Among all,

MRI (magnetic resonance imaging) is the gold standard for establishing a diagnosis of lumbar spinal canal stenosis.<sup>[3,5]</sup> Reduced space inside the canal, whether in the lateral recess, the spinal canal, or the neural foramen, is a sign of lumbar spinal canal stenosis. The lumbar spine may exhibit narrowing at single or multiple levels.<sup>[6,7]</sup>

Due to compression of the nervous system or blood vessels, lumbar spinal canal stenosis can cause lower back pain as well as numbness or pain in the lower extremities.<sup>[1]</sup> Neurogenic claudication is a common symptom for lumbar spinal stenosis patients. Pain will spread to the lower extremities after walking a distance and can reduce walking capacity. The important point of neurogenic claudication is the relationship of symptoms to body posture. The pain is worsening with lumbar extension. Conversely, the pain will decrease when the lumbar flexes. Symptoms will get worse when standing or walking and subside when sitting. This symptom is also known as the shopping cart sign because the extension and flexion positions explain exactly how the symptom gets worse or better.<sup>[3,4]</sup>

Surgical and non-surgical treatment can be done to relieve symptoms caused by spinal stenosis.<sup>[4]</sup> Conservative treatment, which does not entail invasive procedures, can be used for patients with mild to moderate symptoms.<sup>[8]</sup> The other option is surgical treatment if conservative measures fail to relieve symptoms.<sup>[9]</sup> Physiotherapy, other complementary therapies, and modifications to one's lifestyle are a few non-surgical treatment options. On the other hand, surgical procedures like interspinous spacers and decompression are used to release pain and enhance nerve function by releasing compressed nerve structures.<sup>[4,8,9]</sup>

According to a study, after three years without surgical treatment, approximately one-third of patients with lumbar spinal stenosis would experience improvement, while around half would either worsen or show no improvement, and 10–20% would

have their lower extremity and back pain symptoms deteriorate.<sup>[4,10]</sup>

## **MATERIALS & METHODS**

This research took place at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, Bali, Indonesia. Data collection for this study requires ethical clearance from The Research Ethic Commission of the Faculty of Medicine at Udayana University, as well as research authorization from Prof. Dr. I.G.N.G Ngoerah Central General Hospital. The information was gathered from the medical records of lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital between January 2021 and December 2022.

This research's design is a descriptive observational study with total sampling as the sampling technique. The sample was chosen using inclusion and exclusion criteria. The inclusion criteria were degenerative lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital from January 2021 to December 2022. Exclusion criteria include patients with non-degenerative lumbar spinal canal stenosis and incomplete medical records (medical records that do not cover variables examined). This study's sample consisted of 84 people who fit our inclusion criteria. Those collected data were processed and analysed using the frequencies descriptive statistics. The profile of the study was observed based on age group, gender, body mass index, pathoanatomy site, and treatment.

## **STATISTICAL ANALYSIS**

The data that has been collected is processed using SPSS 26 with descriptive statistics to see the profile of the lumbar spinal canal stenosis patients treated in Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, Bali, Indonesia, from January 2021 to December 2022.

## RESULT

Based on the data found at Medical Record Installation, Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, 99 patients were diagnosed with lumbar spinal canal stenosis. Out of all people who were diagnosed, 84.8% (84 patients) fulfilled inclusion criteria and were enrolled in the study, while the other 15.1% (15 patients) whose medical records were incomplete or misclassified were excluded from this study. The data that was taken for this study were age, gender, body weight, height, pathoanatomy location, and management. Next, the data was processed to obtain a profile of lumbar spinal canal stenosis patients at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in from 2021 through 2022. The following are details of the research results and an explanation regarding the profile of lumbar spinal canal stenosis patients which are presented in the form of tables and narratives.

Out of 84 patients, 9.5% (8 patients) were below 39 years old, 9% (10.7%) were between 40 to 49 years old, 40.5% (34 patients) were aged 50-59 years old, and 39.3% (33 patients) were above 60 years old. Therefore, most of the patients were above 50 years old. The description of the distribution of lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in 2021-2022 based on age is presented in Table 1 below.

**Table 1 Profile of LSCS Based on Age at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Period of 2021-2022**

Age (year)	Frequency (n=84)	Percentage (%)
<39	8	9.5
40-49	9	10.7
50-59	34	40.5
>60	33	39.3

Table 2 shows that out of all lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in 2021-2022, male patients are more than female patients marked by 56%

(47) male patients and 44% (37) female patients.

**Table 2 Profile of LSCS Based on Gender at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Period of 2021-2022**

Gender	Frequency (n=84)	Percentage (%)
Male	47	56
Female	37	44

The body mass index was determined based on data on the height and weight of lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in 2021-2022. The classification of body mass index is divided into the underweight group with a body mass index <18.5 kg/m<sup>2</sup>, the normal group with a body mass index of 18.5-24.9 kg/m<sup>2</sup>, the overweight group with a body mass index of 25-29.9 kg/m<sup>2</sup>, and obese with body mass index >30 kg/m<sup>2</sup>.

Based on data, most of the patients have normal body mass index, namely 59.5% (50 patients), followed by the overweight body mass index group with 27.4% (23 patients), then obese patients with 7.1% (6 patients) and the smallest group of patients were underweight with a total of 6% (5 patients). Distribution of lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in 2021-2022 based on body mass index is presented in Table 3 below.

**Table 3 Profile of LSCS Based on BMI at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Period of 2021-2022**

BMI	Frequency (n=84)	Percentage (%)
Underweight	5	6
Normal	50	59.5
Overweight	23	27.4
Obese	6	7.1

Patients with lumbar spinal canal stenosis can experience narrowing in one location or several locations spread from L1 to L5. Pathoanatomy locations are divided into a single site and multiple sites.

Most of the lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in 2021-2022 experienced

narrowing in several locations (multiple sites) with a total of 71.4% (60 patients) and 28.6% (24 patients) experiencing narrowing in one location (single site) which is shown below in table 4.

**Table 4 Profile of LSCS Based on Pathoanatomy Site at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Period of 2021-2022**

Site	Frequency (n=84)	Percentage (%)
Single site	24	28.6
Multiple site	60	71.4

Lumbar spinal canal stenosis patients can be given conservative or operative treatment if conservative treatment is not successful in treating the pain experienced by the patient. Conservative management is the implementation of pain management in patients, while operative treatment for lumbar spinal canal stenosis patients varies from decompression, stabilization, fusion, laminectomy, to epidurolysis.

Based on the data from medical records of lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital, Denpasar, in 2021-2022, it can be found that 92.9% (78 patients) were given operative treatment, while the other 7.1% (6 patients) received pain management. Table 5 below shows the patient distribution according to their management.

**Table 5 Profile of LSCS Based on Treatment at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital Period of 2021-2022**

Treatment	Frequency (n=84)	Percentage (%)
Operative	78	92.9
Conservative	6	7.1

## DISCUSSION

The research results presented in Table 1 show the distribution of lumbar spinal canal stenosis patients who received treatment at Prof. Dr. I.G.N.G. Central General Hospital Ngoerah in Denpasar from January 2021 to December 2022. According to the statistics, the 50 to 59 year age category had the largest number of instances, with 34 (40.5%), followed by individuals over 60 years old, with 33 (39.3%). This aligns with previous research which found that patients

with lumbar spinal canal stenosis are typically over 50 years old on average.<sup>[11]</sup>

From the data shown in Table 2, male patients were slightly more than female patients. Meanwhile, based on earlier studies, predominance has moved from being dominated by males to females.<sup>[12,13]</sup>

According to the research data presented in Table 3, patients with lumbar spinal canal stenosis at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital in Denpasar from 2021 to 2022 had the highest percentage of normal body mass index, with 50 patients (59.5%), followed by 23 patients (27.4%) with an overweight body mass index, six patients (7.1%) with obesity, and five patients (6%) who had underweight body mass index. Although most patients had normal body mass index, previous research indicates a correlation between body mass index and lumbar spinal canal stenosis. Additionally, intervertebral disc degeneration has been associated with high body mass index or obesity.<sup>[14]</sup>

Patients with lumbar spinal canal stenosis at Prof. Dr. I.G.N.G. Ngoerah Central General Hospital in Denpasar from January 2021 to December 2022 mostly experienced narrowing in multiple sites, with 60 patients (71.4%). The data shown in Table 4 is consistent with previous research, which indicated that most patients tend to experience spine degeneration at multiple levels.<sup>[15,16]</sup>

Based on Table 5, research shows that as many as 78 out of 84 patients (97%) received surgical procedures. Lumbar spinal stenosis guideline proposes conservative treatments such as pharmacological and nonpharmacological therapy for mild to moderate patients before operative intervention. Although these conservative treatments are frequently used among patients with lumbar stenosis, their effectiveness is uncertain since relevant research is scarce.<sup>[9,17]</sup>



## CONCLUSION

Lumbar spinal canal stenosis patients treated at Prof. Dr. I.G.N.G Ngoerah Central General Hospital in Denpasar between 2021 and 2022 were over 50 years old. There were slightly more male patients than female patients. Most patients had a normal body mass index. A large percentage of patients experienced narrowing in multiple locations and underwent operative treatment.

### Declaration by Authors

**Ethical Approval:** This study has obtained ethical clearance issued by The Research Ethic Commission of Faculty of Medicine, Udayana University, Denpasar (Ethical Clearance No. 2417/UN14.2.2.VII.14/LT/2023).

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**Conflict of Interest:** The authors declare no conflict of interest.

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