e-ISSN: 2807-7970

AKSONA

Volume 4 Number 2, July 2024

Profiles of Patients with Low Back Pain Caused by Disc Herniation in the Neurology Outpatient Clinic of Dr. Soetomo General Academic Hospital Surabaya during the Period of 2024

Bani Agindra[1], Hanik Badriyah Hidayati[2], Lukas Widhiyanto[3], Lilik Herawati[4]
[1] Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia
[2] Department of Neurology, Faculty of Medicine, Universitas Airlangga; Dr. Soetomo General Academic Hospital, Surabaya, Indonesia
[3] Department of Orthopedic and Traumatology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia
[4] Department of Physiology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

Article info

Article History:
Received Dec 16, 2023
Revised Mar 15, 2024
Accepted Apr 25, 2024
Published Jul 31, 2024

Keywords:
Disc herniation
Low back pain
Outpatient's neurology clinic
Profiles

ABSTRACT

Introduction: Low back pain (LBP) refers to a sensation of pain or discomfort occurring in the region between the lowest costal and gluteal crease, with or without leg pain. Damage to the annulus fibrosus causes disc herniation, allowing the nucleus pulposus to herniate into the spinal canal. In less than 5% of cases, LBP is caused by disc herniation. **Objective:** This study examined the profiles of individuals with herniated LBP discs and related factors at Dr. Soetomo General Academic Hospital Surabaya. **Methods:** The study was conducted at Dr. Soetomo General Academic Hospital Surabaya using secondary data from medical records, which was then analyzed using descriptive statistics. **Results:** Fifty-eight LBP patients with herniated discs were enrolled in this study. The patient sample ranged from 23 to 74 years old, with a mean of 47,98±14,92. The majority of patients (29.3%) were 31–40 years old. Male and female prevalence rates were the same. Employees have the highest percentage of any occupation group, with 56.9%. **Conclusion:** Some of the findings clarify previous studies. Age, gender, and occupation were all linked to the occurrence of either LBP or disc herniation. However, our data cannot indicate whether or not these factors contribute to the occurrence of LBP and disc herniation. Therefore, more research is required to understand these factors and their relation to disc herniation and LBP.

Corresponding Author
Hanik Badriyah Hidayati
Department of Neurology, Faculty of Medicine, Universitas Airlangga; Dr. Soetomo General Academic Hospital, Surabaya, Indonesia
email: hanikhidayati@fk.unair.ac.id

Available at https://e-journal.unair.ac.id/index.php/aksona

INTRODUCTION

Discomfort or pain that occurs between the lower ribs and buttocks is defined as low back pain (LBP).[1] LBP is just an indication of the underlying problem that may involve irregularities in the constituent elements that make up the lumbar are.[2,3] A disc herniation is one of the abnormalities that cause LBP.[4] Disc herniation is a spinal condition in which the annulus fibrosus is damaged, allowing the nucleus pulposus to herniate.[5]

Gender, age, and occupation are among the numerous risk factors for developing LBP.[6,7,8] Women have a higher prevalence of LBP than men.[6] The prevalence also increases with age, peaking in a certain age group before declining.[6,8,9] Advancing age is also associted with an increased risk of LBP with pathologies.[10] Certain occupational factors also contribute to the increased prevalence and risk of developing specific disorders related to LBP.[8,11–13] Other factors that influence LBP include depression, obesity, lack of activity, smoking habits, chronic widespread pain, and physical deconditioning.[14]

There are several potential causes of disc herniation, the most common of which are trauma and aging-related degenerative processes.[5] Age and a higher physical workload are among the risk factors.[15] This condition is more prevalent in individuals aged 30–50 and is more common in males.[5] Disc herniation can be very painful, although only 1–3% of lumbar cases are symptomatic.[5] Disc herniation is responsible for less than 5% of the underlying cause of LBP.[5,16] Pain caused by a herniated disc is consistent with nerve compression or spinal cord dysfunction.[5]

Low back pain is a common condition.[17] In 2017, the prevalence of LBP was 7.5% among 577 million people worldwide[6]. Besides its high prevalence, LBP is also the leading cause of disability.[6] In addition to health effects, LBP has social and economic impacts.[3,6] Meanwhile, disc herniation happens in 5–20 cases per 1000 adults annually.[18,19] These facts highlight the necessity for ongoing research on LBP and disc herniation, particularly in Indonesia, given the lack of available data on their prevalence.

OBJECTIVE

The purpose of this study was to analyze the profiles of LBP patients caused by disc herniation, particularly the characteristics of gender, age, and occupation.

METHODS

This retrospective descriptive study was conducted using secondary data from a medical record. The study was carried out at Dr. Soetomo General Academic Hospital, which is a tertiary hospital in Surabaya, Indonesia. This study included LBP patients over 17 who sought treatment at a neurology clinic in 2021. LBP was diagnosed using the International Statistical Classification of Diseases and Related Health Problems (ICD) code M54.5. On October 31st, 2022, the study received ethical clearance from Dr. Soetomo General Academic Hospital Surabaya's Ethical Committee, with certification number 1111/LOE/301.4.2/X/2022.

The subjects were selected using the total sampling method. If disc herniation was the LBP's etiology, the subject was included. The data encompassed age, gender, occupation, and a pain scale. Patients aged over 17 with a primary diagnosis of low back pain met the inclusion criteria. Patients with incomplete medical records were excluded.

RESULTS

The patient's characteristics are shown in Table 1. The total number of subjects was 58 after the inclusion and exclusion processes. The mean age was 47.98±14.92, with a range from 23 to 74 years old. The biggest proportion was dominated by those aged 31–40 (29.3%), followed by those aged 51–60 (24.1%). Males and females had equal prevalence rates. The employee group had the highest number of occupations, with 33 (56.9%) patients, followed by housewives with 12 (20.7%).

Table 1. Subject Characteristics

Patient Characteristics	n	Percentage
Age		
21-30	6	10.3%
31-40	17	29.3%
41-50	8	13.8%
51-60	14	24.1%
61-70	8	13.8%
71-80	5	8.6%
Gender		
Male	29	50%
Female	29	50%
Occupation		
Student	2	3.4%
Employee	33	56.9%
Entrepreneur	2	3.4%
Housewife	12	20.7%
Physician	1	1.7%
Worker	1	1.7%
Unemployed and retiree	4	6.9%
Others	3	5.2%

Table 2 below presents the gender-controlled

prevalence of patients' ages. In males, the highest proportion was in the third decade group, aged 31–40 (15.5%). Meanwhile, in females' groups, the highest proportion was in the fifth decade group, aged 51–60 (15.5%), followed closely by the third decade group (13.8%).

Table 2. Gender-age crosstabulation

Age (Decade)	Gender	
	Male	Female
2	4 (6.9%)	2 (3.4%)
3	9 (15.5%)	8 (13.8%)
4	4 (6.9%)	4 (6.9%)
5	5 (8.6%)	9 (15.5%)
6	4 (6.9%)	4 (6.9%)
7	3 (5.2%)	2 (3.4%)

Table 3 below presents the occupation-controlled prevalence of patients' gender. In males, the highest proportion was the employee group (34.5%). The highest number of females was also found in the employees' group (22.4%), followed closely by housewives' groups (20.7%).

Table 3. Occupation-gender crosstabulation

Occupation	Gender	
	Male	Female
Student	2 (3.4%)	0
Employee	20 (34.5%)	13 (22.4%)
Entrepreneur	1 (1.7%)	1 (1.7%)
Housewife	0	12 (20.7%)
Physician	1 (1.7%)	0
Worker	3 (1.7%)	0
Unemployed	3 (5.2%)	1 (1.7%)
others	1 (1.7%)	2 (3.4%)

Table 4 below shows the occupation-controlled prevalence of patients' ages. In the age group of the second to fifth decade, the most prevalent occupation was that of employees (6.9%). Meanwhile, in the sixth decade, the employee and unemployed groups have the highest number (5.2%). In the seventh decade group, employees and housewives have the highest number (3.4%)

Table 1. Occupation-age crosstabulation

Occupation	Age (Decade)					
	2	3	4	5	6	7
Student	1 (1.7%)	1 (1.7%)	0	0	0	0
Employee	4 (6.9%)	13 (22.4%)	4 (6.9%)	7 (12.1%)	3 (5.2%)	2 (3.4%)
Entrepreneur	0	0	1 (1.7%)	0	1 (1.7%)	0
Housewife	1 (1.7%)	2 (3.4%)	3 (5.2%)	4 (6.9%)	0	2 (3.4%)
Physician	0	1(1.7%)	0	0	0	0
Worker	0	0	0	0	1 (1.7%)	0
Unemployed	0	0	0	0	3 (5.2%)	1 (1.7%)
others	0	0	0	3 (5.2%)	0	0

DISCUSSION

Age

According to the World Health Organization (WHO), most low back pain cases occur between the ages of 51 and 55, consistent with our findings that people aged 51–60 had the second highest incidence.[20] Previous studies on the LBP patient population at several Indonesian hospitals showed diverse findings about which age is the highest.[9,21] One of those studies indicated 40–60 years as the most prevalent age group, while the other found it to be 61–70 years. Their findings contradict our study, which found most patients were between the ages of 31 and 40, with the 51 to 60 age group following closely after. High rates of LBP in working-age adults may be due to occupational factors,[10] whereas in older people, pain perception and comorbidity may be responsible.[22]

This study revealed that the third decade has the highest prevalence of disc herniation, followed by the fifth decade, which is consistent with a previous study that found a higher prevalence of disc herniation in these age groups.[5] A study in Albania revealed that the mean age of patients with lumbar disc herniation was 44.9, which aligns closely with our findings of 47.98.[23] Aging is linked to spine degeneration, which results in disc herniation.[5] In younger people, previous studies have ruled out that body mass index, traumatic history, genetics, and sitting posture are the most significant risk factors for disc herniation.[24] According to a recent literature review, genetic factors may be the most associated with degeneration.[15]

As people become older, intervertebral discs naturally degenerate, making them more vulnerable.[25] A decrease in capillaries from the endplate to the annulus fibrosus, changes in the morphology and density of cells inside the nucleus pulposus, and the formation of a small cleft in the annulus fibrosus are all signs of significant disc degeneration.[25] Nucleus pulposus is also responsible for disc herniation,

although most of the cases are caused by annulus fibrosus.[25] A previous study found that disc herniation was much less common in older people than in younger people.[26] It is believed that degeneration of the nucleus pulposus leads to atrophy, resulting in less pressure and a lower incidence of herniation.[27]

Gender

We found no difference in male and female LBP cases, which contradicts WHO data that shows women exceed men.[20] Previous Indonesian studies, however, found varied results regarding gender profiles.[9,21] One of these studies found a similar result to ours, with no difference between males and females.[9] LBP in females may be caused by a number of causes, such as biological, psychological, and sociocultural.[28]

Our findings also contradict a previous study that claimed men had a higher rate of disc herniation than women.[5] A study conducted in China, however, found that women were more likely to suffer disc herniation, despite the fact that a bivariate analysis showed no significant correlation between gender and the occurrence of disc herniation.[24] Although we were unable to find a journal that explained the specific pathophysiology that links gender factors and disc herniation, previous research suggested that the prevalence of disc herniation in men may be influenced by their occupation type, while in women, this is less significant but still apparent.[29]

A previous study noted that males have a quicker degeneration rate at a young age than females of the same age, which could be related to increased mechanical stress and physical injury in men. This aligns with our findings, which showed that both the second- and third-decade groups were led by males. They also stated women are more likely than men to get disc degeneration after menopause, around the age of 50.[28] This is also in line with our study, which found that the fifth decade group was led by females.

Occupation

Employees were the most common occupation in this study, with housewives coming in close second, while other occupations were substantially less represented. Our results were similar to those of previous studies on the LBP population. According to research conducted in Islamabad, housewives were the largest occupational group among people with low back pain, followed by office workers and related professions.[8] Meanwhile, an Indonesian study found that entrepreneurs rank highest, followed by housewives.[21] The relation between occupation and the occurrence of LBP is explained through occupational characteristics such as lifting, repetition, and posture.[30]

According to a previous literature review, some occupational factors contribute to disc herniation.[15] Occupations that involve a heavy physical workload, forward bending, a long working period, and stress are more likely to cause disc herniation.[15] Housewives were more susceptible to these conditions, which may explain their increased prevalence of disc herniation in our study. Meanwhile, a previous study of young adults and adolescents found that prolonged daily sitting has a significant relationship with disc herniation.[24] Employees are particularly susceptible to this factor, which could account for the high prevalence of disc herniation in this group. Prolonged sitting causes increased pressure on the disc, which can be resolved by occasionally changing positions to relieve the stress.[31] The notion that younger men may be more susceptible to physical stress and injury could explain why there are more male employees than female ones.[28]

CONCLUSION

This study provides insights into the demographic and occupational characteristics of low back pain (LBP) patients with disc herniation in Indonesia. Key findings included a peak prevalence among middle-aged adults, an equal distribution between genders, and a predominant representation of employees and housewives among affected occupations. Age, gender, and occupation were all correlated to the occurrence of either LBP or disc herniation. Even though some of our findings clarified previous studies about LBP and disc herniation, we can't determine whether these factors contribute to the occurrence of LBP in disc herniation patients. These emphasize the importance of targeted interventions in occupational settings, as well as need for further research to explore regional variations and additional risk factors influencing LBP and disc herniation.

Acknowledgement
The authors would like to thank the staff at Medical Record Installation for providing the data and assisting with data collection.

Conflict of Interest
The authors have no conflicts of interest.

Ethic Consideration
The letter of exemption was issued by Ethics Committee of Dr. Soetomo Hospital Surabaya on October 31st, 2022. Certification number: 1111/LOE/301.4.2/X/2022.

Funding
This study was fully funded by authors.

Author Contributions

The first and second author collected the data and wrote the manuscript. The third and fourth author provided review and revision for the manuscript.

REFERENCES

1. World Health Organization. International classification of diseases 11th revision (ICD-11). 2024. [Web page]
2. Maher C, Underwood M, Buchbinder R. Non-specific low back pain. *Lancet*. 2017; 389(10070):736–47. doi: 10.1016/S0140-6736(16)30970-9
3. Knezevic NN, Candido KD, Vlaeyen JWS, Van Zundert J, Cohen SP. Low back pain. *Lancet*. 2021; 398(10294):78–92. doi: 10.1016/S0140-6736(21)00733-9
4. Manusov EG. Evaluation and diagnosis of low back pain. *Prim Care Clin Off Pract*. 2012; 39(3):471–9. doi: 10.1016/j.pop.2012.06.003
5. Dydyk AM, Massa RN, Mesfin FB. Disc herniation. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023. [Book]
6. Wu A, March L, Zheng X, Huang J, Wang X, Zhao J, et al. Global low back pain prevalence and years lived with disability from 1990 to 2017: Estimates from the Global Burden of Disease Study 2017. *Ann Transl Med*. 2020; 8(6):299. doi: 10.21037/atm.2020.02.175
7. Ramdas J, Jella V. Prevalence and risk factors of low back pain. *Int J Adv Med*. 2018; 5(5):1120–3. doi: 10.18203/2349-3933.ijam20183413
8. Zafar F, Qasim YF, Farooq MU, Shamael I, Khan IU, Khan DH. The frequency of different risk factors for lower back pain in a tertiary care hospital. *Cureus*. 2018; 10(8):e3183. doi: 10.7759/cureus.3183
9. Goin ZZ, Pontoh LM, Umasangadji H. Karakteristik pasien nyeri punggung bawah di poliklinik rehabilitasi medik Rumah Sakit Daerah Kota Tidore Kepulauan periode Januari-Juni 2019. *Kieraha Med J*. 2019; 1(1):44–53. [Journal]
10. Wong AY, Karppinen J, Samartzis D. Low back pain in older adults: risk factors, management options and future directions. *Scoliosis Spinal Disord*. 2017; 12(1):14. doi: 10.1186/s13013-017-0121-3
11. Govindu NK, Babski-Reeves K. Effects of personal, psychosocial and occupational factors on low back pain severity in workers. *Int J Ind Ergon*. 2014; 44(2):335–41. doi: 10.1016/j.ergon.2012.11.007
12. Yang H, Haldeman S, Lu M-L, Baker D. Low back pain prevalence and related workplace psychosocial risk factors: A study using data from the 2010 National Health Interveiw Survey. *J Manipulative Physiol Ther*. 2016;39(7):459–72. doi: 10.1016/j.jmpt.2016.07.004
13. Ishimoto Y, Cooper C, Ntani G, Yamada H, Hashizume H, Nagata K, et al. Factory and construction work is associated with an increased risk of severe lumbar spinal stenosis on MRI: A case control analysis within the wakayama spine study. *Am J Ind Med*. 2019; 62(5):430–8. doi: 10.1002/ajim.22957
14. Rachmawati Y, Hidayati HB. The role of substance P in chronic low back pain (CLBP). *J Islam Pharm*. 2019; 4(2):9–14. doi: 10.18860/jip.v4i2.8613
15. Zielinska N, Podgórski M, Haładaj R, Polguj M, Olewnik Ł. Risk facotrs of intervertebral disc pathology—A point of view formerly and today—A review. *J Clin Med*. 2021; 10(3):409. doi: 10.3390/jcm10030409
16. Schwarzer AC, Aprill CN, Derby R, Fortin J, Kine G, Bogduk N. The prevalence and clinical features of internal disc disruption inpatients With chronic low back pain. *Spine (Phila Pa 1976)*. 1995; 20(17):1878–83. [Journal]
17. Uzlifatin Y, Arfianti L, Wardhani IL, Hidayati HB, Melaniani S. Effect of transcutaneous auricular vagus nerve stimulation addition on disability in chronic low back pain patients: A randomized controlled study. *Anaesthesia, Pain Intensive Care*. 2023; 27(1):73–81. doi: 10.35975/apic.v27i1.2084
18. Amin RM, Andrade NS, Neuman BJ. Lumbar disc herniation. *Curr Rev Musculoskelet Med*. 2017; 10(4):507–16. doi: 10.1007/s12178-017-9441-4
19. Fjeld OR, Grøvle L, Helgeland J, Småstuen MC, Solberg TK, Zwart J-A, et al. Complications, reoperations, readmissions, and length of hospital stay in 34 639 surgical cases of lumbar disc herniation. *Bone Joint J*. 2019; 101-B(4):470–7. doi: 10.1302/0301-620X.101B4.BJJ-2018-1184.R1
20. World Health Organization. Low back pain. 2023. [Web page]
21. Cahya H IPI, Asmara AGY. Prevalensi nyeri punggung bawah pada tahun 2014-2015 di RSUP Sanglah Denpasar. *J Med Udayana*. 2020;9(6):35–9. doi: 10.24843/MU.2020.V09.i6.P08
22. Gibson SJ, Helme RD. Age-related differences in pain perception and report. *Clin Geriatr Med*. 2001; 17(3):433–56. doi: 10.1016/S0749-0690(05)70079-3
23. Azemi ES, Kola S, Kola I, Tanka M, Bilaj F, Abazaj E. Lumbar disk herniation: A clinical epidemiological and radiological evaluation. *Open Access Maced J Med Sci*. 2022; 10(B):1588–94. doi: 0000-0003-2386-4605
24. Qi L, Luo L, Meng X, Zhang J, Yu T, Nie X, et al. Risk factors for lumbar disc herniation in adolescents and young adults: A case–control study. *Front Surg*. 2023; 9:1009568. doi: 10.3389/fsurg.2022.1009568/full
25. Schroeder GD, Guyre CA, Vaccaro AR. The epidemiology and pathophysiology of lumbar disc herniations. *Semin Spine Surg*. 2016; 28(1):2–7. doi: 10.1053/j.semss.2015.08.003
26. Ovcharov ME, Mladenovski MN, Mladenovski IN, Valkov I V., Vasilkova SB. Lumbar disc herniation in children and elderly patients. *Folia Med (Plovdiv)*. 2023; 65(4):631–7. doi: 10.3897/folmed.65.e97233
27. Cai Z, Ma D, Li F, Chen R, Liu Z, Zhang Z, et al. Trend of the incidence of lumbar disc herniation: Decreasing with aging in the elderly. *Clin Interv Aging*. 2013; 8:1047–50. doi: 10.2147/CIA/.S49698
28. Wáng YXJ, Wáng J-Q, Káplár Z. Increased low back pain prevalence in females than in males after menopause age: Evidences based on synthetic literature review. *Quant Imaging Med Surg*. 2016; 6(2):199–206. doi: 10.21037/qims.2016.04.06
29. Heliövaara M. Occupation and risk of herniated lumbar intervertebral disc or sciatica leading to hospitalization. *J Chronic Dis*. 1987; 40(3):259–64. doi: 10.1016/0021-9681(87)90162-7
30. Jia N, Zhang M, Zhang H, Ling R, Liu Y, Li G, et al. Prevalence and risk factors analysis for low back pain among occupational groups in key industries of China. *BMC Public Health*. 2022; 22(1):1493. doi: 10.1186/s12889-022-13730-8
31. Billy GG, Lemieux SK, Chow MX. Lumbar disc changes associated with prolonged sitting. *PM&R*. 2014; 6(9):790–5. doi: 10.1016/j.pmrj.2014.02.014