



Original Article

Sleep Quality and Nocturnal Pain in The Patients of Lumbar Disc Herniation

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ABSTRACT

Patients with lumbar disc herniation frequently report experiencing nocturnal back discomfort that interferes with their ability to sleep adequately. This study's objective is to describe and evaluate the pain and sleep quality of individuals with disc herniation diagnoses. **Objective:** To assess sleep quality and nocturnal pain in patients of lumbar disc herniation. **Methods:** Patients range from 24-65 years, both males and females with positive straight leg raise and prone knee bending test were selected with random sampling technique. Data were collected after filling a comprehensive questionnaire. PSQI questionnaire was used to access quality of sleep disturbance. Visual analog scale was the tool that used to help the person rate the intensity of pain at night. **Results:** The results showed that 6(12%) had mild disturbance in sleep, 33(66%) had moderate disturbance in sleep and 11(22%) had severe disturbance in sleep according to global PSQI. **Conclusions:** According to the findings from our study, lumbar disc herniation has negatively impacted the participants' ability to sleep. Sleep disruption and pain were connected, and nocturnal discomfort affected patient's activities of daily living.

INTRODUCTION

The most typical type of vertebral disease is disc herniation. 90% of individuals who suffer from disc herniation occur at the lumbar level, which bear the bulk of the body's weight [1]. About 80% of people have low back pain at least once in their lifetime [2]. Disc herniation is one of the most frequent particular causes of back pain [3]. The spinal bodies are connected by the vertebral column, which is located between them [4]. Herniation of disc material outside of its anatomical area in the lumbar spine is a common problem that results in the production of such an isolating disc whenever the herniated disc separates from

the parent disc [5]. Although the words "disc herniation," "disc protrusion," and "disc bulge" are frequently interchanged in the literature, these pathologies described a disc herniation as "localized or focused protrusion of disc material beyond the confines of the intervertebral disc space"[6]. Wide-based herniations, or protrusions, have a diameter at their base that is larger than their canal-side herniation's diameter [7]. In the condition of low back pain, lumbar disc herniated (LDH) is strongly correlated with inflammation [8]. Mechanical compression can cause hypoxia and nerve root symptoms by stretching and

deforming the nerves as well as by compressing the vascularization [6]. One of the main issues contributing to poor sleep quality is pain [9]. Poor sleep is the inability to sleep for an extended period of time (at least 6 hours), that is impacted by personal decisions, work activity, or other circumstances [10]. The majority of cases, leg and lumbosacral pain is caused along with sleep problems [11]. There are some studies that explained connections between depression, sleep, and quality of life and ruptured disc-related low back pain [12]. Recent research was conducted which showed a strong relationship between pain severity and sleep issues. The lower quality sleep at night strongly predicted increased reports of pain, decreased physical performance, and higher negative pain symptoms, particularly in the morning [13]. A study conducted in 2015 in turkey showed disc herniation can be avoided by maintaining good posture and using devices that are ergonomically designed [14]. Using conventional pain control techniques can improve the quality of sleep. The patients may have greater sleep quality with proper pain management [15]. Sleep disruption may impede important mechanisms, such as endogenous pain inhibition and joint pain, that are involved in the emergence and maintenance of chronic pain [10]. The physical aspect of quality of life was negatively impacted by the low quality of sleep [16]. LBP and disability are correlated with increases in SQ. Baseline SQ, however, does not predict changes in pain or impairment [17]. There are only weak associations for pain intensity between the NPRS and other measures [18]. Lumbar extension standing producing unilateral pain, and resisted hip internal rotation producing ipsilateral pain [19]. Lower quality sleep at night strongly predicted increased reports of pain, decreased physical performance, and higher negative pain symptoms, particularly in the morning [20].

METHODS

A cross-sectional study was conducted. Sampling technique was simple random sampling and convenient sampling. The study was performed between October 2022 - January 2023 on 50 patients. We calculated the sample size using Cochran formula. The confidence level was 95% and level of precision is 0.05%. Patient aged 24-65 years both male and females with disc herniation in outdoor physiotherapy department of Dar-ul-Shifa hospital and Younas hospital. Subjects with age group 24-65 who were willing to participate in the study. Both males and females with positive straight leg raise and prone knee bend test were included in the study. Malignancy, infection in lumbar region, severe hypertension, severe cardiac failure, uncontrolled diabetes mellitus). patients with coexisting back pain and radiculopathies (kidney, bladder bowel

syndrome, hip pathology, weight loss and cauda equine syndrome) were excluded in our study. Questionnaire was the main tool of collecting data. We use two questionnaires for data collection. Simple questionnaire for lumbar pain, Pittsburgh Sleep Quality Index (PSQI). Data were analyzed using SPSS version 20.0. frequency and percentages were calculated for qualitative variables.

RESULTS

According to Table 1, among 50 patients 14(28%) were between 24-35 years, 10(20%) were between 36-45 years, 20(40%) were between 46-55 years and 6(12%) were between 56-65 years.

Table 1: Participant's Age

Age	Frequency (%)
24 - 35 years	14(28)
36 - 45 years	10(20)
46 - 55 years	20(40)
56 - 65 years	6(12)
Total	50(100)

According to Table 2, among 50 patients 9(18%) had aching pain, 14(28%) suffer from stabbing pain, 22(44%) had sharp pain and 5(10%) had dull pain.

Table 2: Character of pain

Character of Pain	Frequency (%)
Aching	9(18)
Stabbing	14(28)
Sharp	22(44)
Dull	5(10)
Total	50(100)

According to Table 3, 14(28%) patients feel pain always, 15(30%) suffer it occasionally, 20(40%) feel the pain sometimes and only 1(2%) never felt the pain.

Table 3: Effect of pain on activities of daily living

Character of Pain	Frequency (%)
Never	1(2)
Occasionally	15(30)
Sometimes	20(40)
Always	14(28)
Total	50(100)

According to Table 4, 6(12%) had mild disturbance in sleep, 33(66%) had moderate disturbance in sleep and 11(22%) had severe disturbance in sleep.

Table 4: Psychological assessment of pain and sleep pattern

Global PSQI	Frequency (%)
Mild disturbance (Score < 7)	6(12)
Moderate disturbance (Score 8 - 14)	33(66)
Severe disturbance (Score 15 - 21)	11(22)
Total	50(100)

DISCUSSION

According to the outcomes of the study under

consideration, the majority of patients had PSQI scores that were much above the global sum of 5, which would be thought as a sign of poor sleep. Age and BMI had no impact on the overall PSQI score or lumbar disc herniation. This research revealed a significant link among insufficient sleep and the pain it causes, and the majority of patients' sleep disturbances were brought on by nocturnal discomfort. In year 2017, a study was conducted on patients of chronic low back pain. Data were collected using structured electronic diary five times per day for 14 days. Patients were assessed on the basis of pain catastrophizing and its effect on daily activities of living of patient. The results of the study showed that poor sleep quality not only effect patient's activities of daily living but had negatively impacted patient's mood. The results of the study show consistency with the hypothesis of the present study that night pain in patients with lumbar disc herniation has relationship with quality of sleep of the patients [13]. In year 2015, a study was conducted on 77 patients assessing their pain on the basis of visual analogue scale (VAS), The Global PSQI and the Oswestry disability index (ODI). A positive correlation was found between VAS, ODI and PSQI with $p < 0.001$. This show relationship between sleep quality, night pain and its impact on quality of life of patient. Although assessing quality of life is not aim of the study of Altaf et al., but the results of the above study showing relationship among sleep quality and nocturnal pain shows close consideration with the results of the study under consideration [21]. Descriptive research was conducted in 2018 to investigate the association between poor sleep quality and persistent low back pain Rush University Medical Center's James I. The study was conducted on 121 patients. The study shows the relationship between poor sleep quality and chronic low back pain. Data collection was done using a visual analogue scale. The findings showed that lower quality sleep at night strongly predicted increased reports of pain, decreased physical performance, and higher negative pain symptoms, especially in the morning. So, the results of the current study revealed that all the patients scored above 5 on Global PSQI which is indicator of poor sleep quality in patients with lumbar disc herniation [13, 17]. Sezgin et al., in year 2015 conducted a study using McGill pain questionnaire, SF-36 form and global PSQI questionnaire to check sleep disturbance and its impact on quality of life in patients with chronic low back pain. The PSQI total score of patients were related with MPQ with $p < 0.001$. The result of this study shows significance relationship between night pain and sleep quality of patients with chronic low back pain [7]. Zahra et al., conducted a descriptive cross-sectional study in year 2022 to find relationship between sleep quality and nocturnal pain in patients of rotator cuff

syndrome. The study enrolled 36 patients and data were collected using Global PSQI questionnaire. The results showed out of 36, 7 patients had mild disturbance in sleep, 18 had moderate disturbance and 11 had severe disturbance in sleep. The results showed close consideration with the present study where 6 had mild disturbance in sleep 33 had moderate disturbance in sleep and 11 had severe disturbance in sleep [22]. Numerous variables, including the length, location, and intensity of pain, have an impact on sleep. One of the most significant elements influencing sleep quality is low back discomfort. Sleep issues or poor quality might be caused by pain. The majority of the time, leg and lumbosacral pain is brought on by sleep disruption. The quality of sleep may be impacted negatively by low back and leg pain, which can cause sleep disruption, early awakenings, and trouble sleeping or staying asleep. The intensity of pain and sleep disruption are closely correlated. In 2022, a study was conducted to evaluate connections between depression, sleep and quality of life in ruptured disc-related low back pain. According to the results of this study sleep efficiency was reduced to 77.1% with lower quality of life because of sleep disturbance. The results are considerable to current study where 66% of patients suffer with moderate disturbance in sleep according to Global PSQI [12]. Pain becomes more severe when it interferes with sleep quality according to the global PSQI, the findings of our study revealed that 6 (12%) participants had light sleep disturbances, 33 (66%) had moderate disturbances, and 11 (22%) had severe disturbances. Additionally, a shaky link between sleep disruption and pain severity was found by Alsaadi et al., [23]. A modest association between LBP and sleep was shown by Zarrabian et al., study [24]. In contrast to our research, they discovered that poor sleep quality (high PSQI score) was present even when pain levels were mild. There was also evidence of a connection between pain severity and sleep quality. Sleep quality was compromised as pain intensity rose. According to Tang et al., and Alsaadi et al., presleeping discomfort has no impact on the nighttime sleep cycle [25, 26]. Additionally, a disturbed night's sleep makes the discomfort you feel the next day worse. Our findings are consistent with those from earlier research. Even though there was intense pain, the sleep quality was good, suggesting that pain is not the primary factor impacting sleep quality. This is in line with research by Tang et al., and Alsaadi et al., who asserted that pain intensity is a changeable complaint and that pain does not necessarily disrupt sleep cycle, albeit nociceptive stimuli might disturb sleep. According to the study's findings, lumbar disc herniation has adversely affected the participants' capacity to sleep, which is supported by our findings. In earlier investigations, similar outcomes were attained.

Past studies assessed sleep quality in shoulder and other back disabilities and compared them while our study assess sleep quality in patients of lumbar disc herniation. Current study had assessed sleep quality in only lumbar disc herniation patients. Rationale was to assess poor sleep quality associated with back pain in lumbar disc herniation patients. And current study showed no impact of age and BMI on global PSQI. Further research should be conducted on both urban and rural areas of Sialkot because of their different lifestyles. Further research should also include the causes and risk factors of lumbar disc herniation. Further study should include both government and private sector hospitals of Sialkot. Further study should be conducted to spread awareness about ergonomics and posture. Further study should be conducted to spread preventive strategies to reduce the risk of lumbar disc herniation.

CONCLUSIONS

According to the findings of the study, lumbar disc herniation has negatively impacted the participants' ability to sleep. Sleep disruption and pain were connected, and nocturnal discomfort affected almost all participants' ability to sleep. The research showed that out of 50 patients, 33 patients had moderate disturbance of sleep, 11 had severe disturbance of sleep, 6 patients had mild disturbance of sleep according to global PSQI due to lumbar disc herniation. The study showed that age and BMI had no impact on PSQI scoring.

Authors Contribution

Conceptualization: FA

Methodology: SB

Formal Analysis: RT

Writing-review and editing: FA, DA, TZ, ZA, MA, AK

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

The authors declare no conflict of interest.

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