

Frequency of sleep disturbance with chronic low back pain: a cross sectional study

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Abstract

Objective: To determine the frequency of sleep disturbance among individual with chronic low back pain, and to explore the association between the two.

Method: The cross-sectional study was conducted from January to March, 2017, at the Physiotherapy Department of the Institute of Physical Medicine and Rehabilitation, Dow University of Health Sciences, Karachi, and comprised patients of either gender aged 18-40 years with at least a three-month history of chronic low back pain. . Data was collected using insomnia severity index for sleep disturbance and Rolland Morris questionnaire for disability due to chronic low back pain. Data was analysed using SPSS 21.

Result: Of the 110, patients 68(62%) were males. The overall mean age of the sample was 31.79 ± 6.18 years. Mean functional disability score was 13.66 ± 2.44 , while 84(76.4%) had sleep disorder; 78(70.9%) having sub-threshold insomnia, and 6(5.5%) with clinical insomnia of moderate severity. There was a positive intermediate correlation between sleep disorder and functional disability ($p < 0.05$).

Conclusion: Frequency of sleep disturbance was high in patients with chronic low back pain. There was an intermediate positive correlation between the two.

Keywords: Pain, Sleep, Disability, Insomnia, Correlation. (JPMA 70: 869; 2020).

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Introduction

Chronic low back pain (CLBP) and sleep disorders are well-documented health problems that commonly occur together. Proper sleep helps in restoring the normal function of the body. They involve substantial psychological and physiological changes and interlink with common patho-physiological mechanisms.¹ These changes in the long term could lead to serious health conditions i.e. obesity, depression, hypertension (HTN) and coronary artery disease (CAD).²

LBP is defined as pain confined below the 12th rib and above the inferior folds of the gluteal region posteriorly with or without the involvement of leg pain. About 90% of LBP cases are classified as non-specific and the remaining as specific with a suspected pathological cause. LBP lasting >3 months is assessed and addressed as CLBP. Approximately, 20% of the adult population experiences an LBP episode at any given time. Lifetime prevalence is estimated to be around 80%.³

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The LBP is linked with physically straining work-tasks, like forward bending, lifting heavy weights, bad posture, whole-body vibration, and psychosocial exertions, like high demand and low control.⁴ This phenomenon results in disability, depression and work-loss.⁵ Considerable attention has been given with limited success to understanding and managing CLBP problems, and an increasing number of LBP patients have been reporting significant problems with sleep quality.⁶

Literature on pain has shown that poor sleep quality lowers the mental capacity to manage pain. It has been hypothesised that improving the quality of sleep can facilitate endogenous mechanisms of controlling pain.⁷ The patients accompanying CLBP have arousal disturbance in the brain waves during sleep and wake up un-rested.⁸ The CLBP contributes to functional and structural changes in the central and peripheral nervous systems that adjust pain and sleep. This mechanism is comprehended inadequately. Many aspects of sleep disorder and CLBP should still be investigated, as each of the conditions is complex and multi-factorial.⁹

Though different studies have suggested a more or less

positive association between sleep disorder and LBP, there is limited evidence regarding this topic,⁹⁻¹³ requiring further exploration. The current study was planned to assess the frequency of sleep disturbance and to find any relationship between self-reported functional disabilities and sleep disorder among patients with CLBP.

Patients and Methods

The cross-sectional study was conducted from January to March, 2017, at the Physiotherapy Department of the Institute of Physical Medicine and Rehabilitation, Dow University of Health Sciences (DUHS), Karachi. After getting approval from the institutional review board, the sample size was calculated using Open-Epi 3.0¹⁴ with a hypothesised frequency of 92.2% related to sleep quality, 5% confidence limits, 1% data effect and 95% confidence level.⁹ The sample was raised using non-probability purposive sampling technique, and included patients of either gender aged 18-40 years with at least a three-month CLBP history. Those feeling severe despondency and dejection, those with presence of neurological disorder like stroke, and patients having recently undergone spinal or abdominal surgery were excluded. After getting written informed consent from the subjects, a self-administered survey form was provided to all of them. The survey questionnaire included close-ended questions with socio-demographic factors, Insomnia Severity Index (ISI) and the Roland Morris Questionnaire (RMDQ).

The ISI is a tool used to screen the severity of sleep disorder. It comprises seven inquiries regarding onset of sleep, upkeep of sleep, problems in waking up early, degree of fulfilment with current pattern of sleep, sleep problem interference with everyday functioning, perceptible to others in relations of affecting the quality of life of an individual and worried about the sleep problem. Each factor is scored on a 5-point Likert scale from 0 to 4. The overall score ranges 0-28. A score of 0-7 refers no clinically significant insomnia, 8-14 sub-threshold insomnia, 15-21 clinical insomnia of moderate severity, and 22-28 severe clinical insomnia. The cut-off score of 14 has 94% specificity and sensitivity.¹³

RMDQ is a self-reported questionnaire having 24 questions with an overall score of 24. Scores up to 15 indicate low-level disability, and >15 show high level of disability.¹⁵ Data was analysed using SPSS 21. Descriptive statistics was used including mean, standard deviation, frequencies and percentages. Spearman's correlation test (r) was used

Table-1: Demographic characteristics of study population (n=110).

Variables	n (%)
Gender	
Male	68 (61.8)
Female	42 (38.2)
Time onset of symptoms	
3 months - 1 year	71 (64.5)
1-2 years	25 (22.7)
2 years or more	14 (12.7)
Cause	
Non specific	77 (70)
Disco-genic	33 (30)
Professional status	
Active	72 (65.5)
Away due to CLBP	38 (34.5)
Education	
Incomplete higher school	2 (1.8)
Incomplete higher education	15 (13.6)
Complete higher education	93 (84.5)

Table-2: Insomnia severity index of patients with chronic low back pain (n=110).

Insomnia Severity Index	n (%)
No clinically significant insomnia	26 (23.6)
Sub threshold insomnia	78 (70.9)
Clinical insomnia (moderate severity)	6 (5.5)

Table-3: Mean scores of Rolland Morris disability score and Insomnia severity index score.

Variables	Mean±SD
Rolland Morris disability score (functional disability)	13.6636±2.44678
Insomnia severity index score (sleep disturbance)	8.8909±2.49530

SD: Standard Deviation.

to explore the association between functional disability and sleep disturbance. $P < 0.05$ was considered significant.

Result

Of the 110, patients 68(62%) were males, and 42(38%) were females. The overall mean age of the sample was 31.79 ± 6.18 years. Also, 77(70%) of the patients had non-specific LBP (Table 1).

Mean functional disability score was 13.66 ± 2.44 , while 84(76.4%) had sleep disorder; 78(70.9%) having sub-threshold insomnia, and 6(5.5%) with clinical insomnia of moderate severity (Table 2).

There was a positive intermediate correlation between sleep disorder and functional disability ($p < 0.05$). The correlation had a moderately linear trend, suggesting that functional disability associated with sleep disturbance (Table 3).

Discussion

The findings showed higher frequency of sleep disorder

with mostly sub-threshold level in patients with CLBP. This revealed a positive association of sleep disorder with self-reported disability among CLBP patients.

In the current study, 70% patients had non-specific causes while 33% had discogenic cause. These findings are in contrast to findings from an earlier study which might be due to their sample size with a female-majority and higher mean age.⁹

The frequency of sleep disorder in current study was lower than a previous study, probably due to different outcome tool used, lower mean age and different gender majority.⁹ In the study, the frequency of sleep disorder was lower than the frequency in the current study with participants scoring >7 on ISI. As the sample size affects frequency, there result might be due to the larger sample size than was the case in the current study.¹²

The mean ISI scores in the current study was 8.89 which was close to 9.7 reported earlier.¹⁶ That study had a sample aged 20-65 years, while the current study had it 18-40 years.¹⁶

In the current study, RMDQ scores indicated low functional disability. However, most respondents (34.5%) were away due to illness, which suggest that many patients with low functional disability do not stay with their work activities.

A study⁹ showed weak positive association between CBLP and sleep disturbance, while the current study suggests strong positive association. The other study used⁹ Pittsburgh Sleep Quality Index (PSQI) to assess sleep disturbance which might give different results than ISI which was the outcome tool used in the current study. The results suggest that correlation between RMDQ and ISI is strong in patients suffering from CLBP but other influences may also be present in association with sleep disorder. Furthermore, the changes in severity of sleep disorder may have different causes, which require further studies to evaluate. The current study used self-reporting tools to identify sleep disturbance and had a small sample size which are limitations. Future studies with large sample size and objective methods to identify sleep disturbance are recommended.

It is important that all multidisciplinary team members take part to manage CLBP. Delivering comprehensive care to CBLP patients as a holistic treatment for the condition, along with associations like sleep disorder, is essential.

Conclusion

There was high level of sleep disturbance in patients suffering from CLBP and a positive relationship between severity of sleep disturbance and functional disability.

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