

Correlation of Migraine Severity with Sleep Quality in Young Adults

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Abstract: Migraine is a common neurological condition that significantly affects the quality of life, and the emerging evidence of the reciprocity is, the severity of migraine and sleep disorders have a two-way relationship. The objective of the paper was to establish the relationship between the intensity and the sleep quality of migraine and sleep quality among young adults. The study was cross-sectional-observational research study that involved 100 respondents aged 18 to 35 years, who met the International Classification of Headache Disorders (ICHD-3) criteria of having migraine. The severity of migraine was determined by the help of Migraine Disability Assessment Scale (MIDAS), the quality of sleep was determined by the help of Pittsburgh Sleep Quality Index (PSQI). The findings indicated that there is a positive and close relationship between severity of migraine and quality of sleep ($r=0.62$, $p<0.01$) implying that the more the migraine had impaired one is, the less the quality of sleep. These findings suggest the importance of the assessment of sleep patterns in the treatment of migraine and that sleep enrichment creates a potential intervention that might be used to reduce the intensity of migraine and enhance overall health.

Keywords: MIDAS, PSQI, migraine, sleep quality, sleep disturbance, and young adults.

INTRODUCTION

Migraine is a recurrent and chronic neurological condition that is typified by moderate to severe headaches that are usually accompanied by nausea, vomiting, light phobia, and sound phobia. It is among the most causes of disability in the world especially among the youth adults in their prime productive periods. Migraine does not only lead to physical discomfort, but also has a great effect on social, academic and occupational functioning, which results in an enormous decrease in the quality of life. Migration of migraine in young adults is estimated to be 10-15 throughout the world, which makes it a high-priority topic in the domain of public health [1].

Recent research studies have suggested the multifacetedness of the migraine-sleeping disorders relationship. Sleep is vital in the neurological wellbeing of an individual, pain processing, and cognitive and emotional aspects. The interrupted sleep can be the precipitant of migraine attacks and it may be the outcome of common headaches. The quality of sleep has been found to be related to high levels of migraine frequency, length of the attack and intensity of the pain in a two way relation. Conversely, frequent and severe migraine headaches can disrupt the normal sleeping habits that lead to fragmented sleep, slow onset of sleep and sleep efficiency [2].

Lifestyle issues or factors that pose a particular risk to young adults when it comes to sleep disturbances include abnormal sleep patterns, academic or professional stress,

excessive screen time, and external social commitments. These can increase the intensity of migraine and this is a vicious cycle of sleep disturbance and headache. Although the relationship between migraine and sleep disorders has been acknowledged, very few studies have aimed at measuring this relationship among the young adults and how much the severity of migraine is related to the quality of sleep [3].

Measuring the severity of migraine and sleep quality with the help of the standardized instruments is necessary to determine those who are at risk of poor outcomes. The Migraine The Disability Assessment Scale (MIDAS) is the best as it provides a person with a quantitative estimate of the disability and severity of migraine as compared to the Pittsburgh Sleep Quality Index (PSQI) which measures different attributes of the sleep quality like duration, latency, efficiency and disturbances [4].

The proposed study will examine the connection between the quality of sleep and the severity of migraine in young adults to give some form of insight into the role of sleep in the management of migraine. This understanding of the relationship may be utilized to facilitated the clinical intervention such as behavioral, sleep and specific therapies to reduce the burden of migraine and the overall quality of life in the population [5].

MATERIALS AND METHODS

Study Design and Setting

It was cross-sectional observational research that was conducted in Neurology and Internal Medicine Departments of a tertiary care teaching hospital over a six-month period. The intention of the research was to find out the correlation between severity of migraine and the quality of sleep among young adults [6].

Study Population

The study recruited 100 young adults aged 18-35 years with migraine as per the International Classification of Headache Disorders, 3rd edition (ICHD-3) criteria [7].

Inclusion Criteria

- Age between 18-35 years.
- At least 6 months of migraine (with or without aura) diagnosis.
- Ready to be involved and give informed consent [8].

Exclusion Criteria

- Existence of other long-lasting neurological problems (e.g. epilepsy, multiple sclerosis).
- Psychiatric illness history relating to sleep (e.g. major depression, anxiety disorders).
- Taking of drugs that influence sleep (e.g., sedatives, stimulants) in the last one month.
- Long-term medical disorders related to sleep (ex: obstructive sleep apnea, chronic pain syndrome) [9].

Data Collection

The following data were obtained: demographic (age, gender, occupation), clinical (duration of migraine, frequency of attacks, migraine subtype, medication use), and lifestyle (sleep, caffeine, and screen time) [10].

Assessment Tools

- **Migraine Severity:** Migraine Disability Assessment Scale (MIDAS) was employed to measure the effects and the severity of the migraine. The scores of MIDAS categories migraine-related disability as minimal (0-5), mild (6-10), moderate (11-20), and severe (> 20).
- **Sleep Quality:** The subjective sleep quality in the last month was measured using the Pittsburgh Sleep Quality Index (PSQI). A score above 5 on PSQI reflects poor sleep quality whereas the score of 5 or below reflects good sleep quality [11].

Outcome Measures

- **Primary outcome:** The relationship between the severity of migraine (MIDAS score) and the quality of sleep (PSQI score).
- **Secondary outcomes:** Relationship between variables of demographics and clinical variables and migraine severity and sleep quality [12].

Statistical Analysis

The SPSS version 25.0 was used to analyze the data. Continuous variables were presented in mean and standard deviation (SD), and continuous variables were in forms of frequencies and percentages. The relationship between the scores of MIDAS and PSQI was evaluated through Pearson correlation coefficient. Associations between demographic/clinical factors and migraine or sleep quality were assessed with chi-square test or independent t-test. A p-value below 0.05 was found to be statistically significant [13].

Ethical Considerations

The Institutional Ethics Committee gave consent to the study protocol. Informed consent was signed by all the participants. Participant data privacy and confidentiality were not violated (Figure 1) [14].

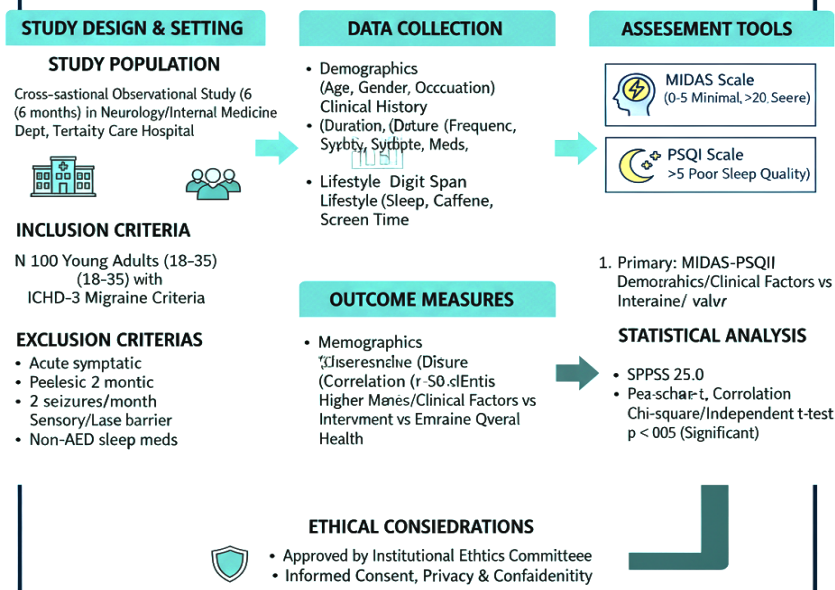


Figure 2: Research Methodology

RESULTS

The study used 100 young adults who had migraine. The population of the study included 62 females (62% and 38 males (38%), with the average age of 26.8 ± 4.5 . The average period of migraine was 5.25 years with a standard deviation of 2.75 and average frequency of migraine attacks was 4.15 episodes per month (Table 1).

Table 1: Demographic and Clinical Characteristics of Study Population (n = 100)

Parameter	Category	Number of Patients (n)	Percentage (%)
Gender	Female	62	62
	Male	38	38
Mean Age (years)	—	26.8 ± 4.5	—
Mean Duration of Migraine (years)	—	5.2 ± 2.8	—
Mean Frequency of Migraine Attacks (per month)	—	4.1 ± 1.5	—

Migraine Severity

Based on MIDAS scores:

- Minimal disability: 18 (18) patients.
- Mild disability: 24 patients (24%)
- Moderate disability: 32 (32) patients.
- Severe disability: 26 patients (26%) (Table 2, Figure 2)

Table 2: Migraine Severity Based on MIDAS Scores

MIDAS Category	Number of Patients (n)	Percentage (%)
Minimal disability (0-5)	18	18
Mild disability (6-10)	24	24
Moderate disability (11-20)	32	32
Severe disability (>20)	26	26

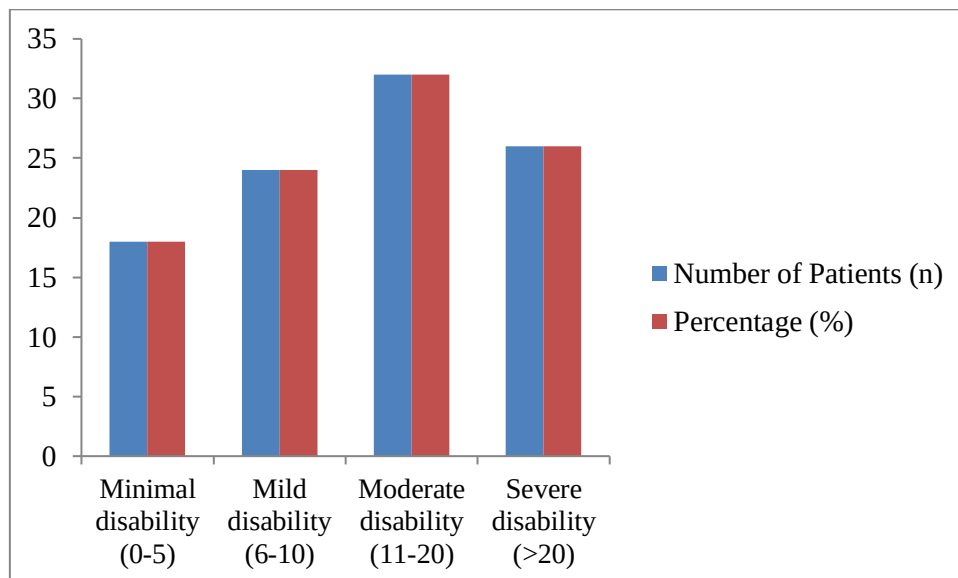


Figure 2: Graphical Presentation of Migraine Severity Based on MIDAS Scores Sleep Quality

Based on PSQI scores, 68 patients (68 percent) were found to have poor sleep quality (PSQI >5), and 32 patients (32 percent) were found to have good sleep quality (PSQI ≤5). The mean PSQI score was 7.3 ± 2.4 (Table 3).

Table 3: Sleep Quality Based on PSQI Scores

Sleep Quality	Number of Patients (n)	Percentage (%)
Good sleep quality (PSQI ≤5)	32	32
Poor sleep quality (PSQI >5)	68	68
Mean PSQI Score	—	7.3 ± 2.4

Relationship between the severity of migraine and the quality of sleep

There was a high positive association between the severity of migraine (MIDAS score) and poor sleep quality (PSQI score), the Pearson correlation coefficient $r = 0.62$ ($p < 0.01$). This implies that the better the sleep quality, the higher migraine-related disability.

Relation with Clinical and demographic Factors

There was a non-significant difference between the MIDAS score and the quality of sleep in females and males with women having a higher score ($p > 0.05$). The low quality of sleep was significantly related to higher migraine frequency (>4 attacks/month) ($p < 0.01$). The longer period of migraine (>5 years) was also correlated with high MIDAS and PSQI scores ($p < 0.05$). There were no significant associations between the use of preventive migraine therapy and the quality of sleep ($p > 0.05$) (Table 4).

Table 4: Association of Clinical Factors with Sleep Quality

Clinical Factor	Poor Sleep Quality (%)	p-value
Female Gender	70	>0.05
Male Gender	65	>0.05
Migraine Frequency >4 /month	78	<0.01
Migraine Duration >5 years	74	<0.05
Preventive Therapy Usage	66	>0.05

Moderate to severe disability with migraine was observed in 58 percent of the respondents. The quality of sleep was poor in 68 percent of the respondents. The relationship between the severity of migraines and the quality of sleep is significantly positive indicating that the severity of migraine is correlated with disrupted sleep. One of the major causes of poor sleep quality among the young adults is frequency and duration of migraine attacks. These findings indicate the significance of assessing sleep patterns during the management of migraine and indicate that sleep-improving interventions could be effective in decreasing the severity of the migraine and improve the overall well-being.

DISCUSSION

The current article examined the relationship between the severity of the migraine and the quality of sleep among young adults and found that the combination of the headache burden and sleep disorders is significant [15].

Out of the 2 out of the 100 individuals who had attended, half of the respondents with moderate to severe migraine associated disability were moderate and severe based on the MIDAS scores that suggested that indeed the respondents were severely impacted in their day to day activities. This conforms to past experiences where literature has established severe to moderate degrees of disability of migraine mainly in a population where its prevalence can either be constant or common [16].

The excellence of sleep was renowned to be poor in 68% of the participants and the mean PSQI score was 7.3 ± 2.4 . This prevalence predisposes the increasing rate of sleep disturbance in young adults, particularly because of the lifestyle aspects like irregular sleep, academic pressure, and screen time enhanced by discomforts associated with migraine pain. Sleep deprivation may impair restorative functions, change the pain threshold, and predispose oneself to migraine attacks in a vicious cycle [17].

The correlation analysis revealed that the scores of MIDAS and PSQI had a significant positive relationship ($r = 0.62$, $p < 0.01$), which showed that the severity of migraine was correlated with the low sleep quality. It confirms earlier studies that define sleep disruption as a

cause and effect of migraine and the two-way relationship between the severity of migraine headaches and sleep quality [18].

There are no most important impact of the preventive therapy on the quality of sleep, which could be reflected in the different responses to the therapy or adherence of the subjects [19].

The findings indicate the importance of the measurement of the quality of sleep in young adults with migraine. The combination of sleep hygiene interventions with cognitive behavioral therapy, lifestyle modifications, and pharmacological analysis may help improve the outcome of headaches along with wellbeing in general. A close evaluation of both migraine severity and regularity in comparison with sleep disturbance is required by clinicians in order to provide comprehensive care [20].

Our results are in line with the past studies that confirm that the quality of sleeping is strictly correlated with the severity of migraine. There are often complaints of difficulties with the initiation and maintenance of sleep, day somnolence and disrupted sleep habits associated with high migraine burden young adults. The frequency and severity of migraines were reduced by sleep enhancement interventions which justifies the clinical implication of our findings [21].

Comprehensively, the severity of migraine and the lack of good sleep are closely associated in young adults. The regularity and prolonged frequency of migraine episodes worsens sleep dysfunctions, and combined management

interventions, which include management of the headache and sleep disorders are necessary to improve quality of life [22].

CONCLUSION

The research establishes that there is a strong positive interrelationship between the intensity of migraine and sleep quality among young adults. A high percentage of the subjects showed moderate to severe disability due to migraine and disrupted sleep, and the memory, focus, and functional ability were probably impaired. Poor sleep was significantly due to higher frequency and duration of migraine, and gender and preventive therapy were not significant. These results highlight the significance of the inclusion of sleep measurement and management in the treatment of migraine. Sleep hygiene, lifestyle change, and proper migraine treatment interventions can be used to decrease the burden of migraine and increase overall good life quality among young adults.

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