Evaluation of sleep quality in adults with major depressive disorder.

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Abstract

Introduction

Sleep disturbances represent a core symptom cluster in Major Depressive Disorder (MDD), profoundly affecting patient prognosis, daily functioning, and overall quality of life. Characterizing the patterns and severity of sleep issues within MDD populations is vital for optimizing clinical management strategies. This study aimed to comprehensively evaluate the prevalence, and clinical correlates of disturbance in sleep quality among adult MDD patients attending psychiatry OPD at Birat Medical College and Teaching Hospital (BMCTH), with a particular focus on the relationship between sleep quality and depression severity.

Material and methods

A descriptive, cross-sectional study design was employed. Data collection occurred over a 1-year period (August 2023 - July 2024) within the Department of Psychiatry. Utilizing purposive sampling, 110 adult out-patients meeting DSM-5 criteria for MDD were enrolled. Information was gathered using a structured proforma for socio-demographic and clinical details, the Hamilton Depression Rating Scale (HDRS) for assessing depression severity, and the Pittsburgh Sleep Quality Index (PSQI) for evaluating subjective sleep quality over the preceding month. Statistical analyses included descriptive statistics, independent t- tests, Pearson's correlation, and multiple linear regression.

Results

The study cohort (N=110) had a mean age of 38.5 ± 11.5 years, comprised equally of males and females (50% each). The average duration of the current illness episode was 9.1 ± 4.2 months. A striking 78.2% (n=86) of patients reported poor sleep quality, defined by a PSQI global score > 5. The sample's mean global PSQI score was 12.8 ± 4.5, signifying substantial disturbance in sleep quality. A strong positive correlation emerged between PSQI global scores and HDRS total scores (r = 0.68, p= 0.001). Multiple linear regression identified HDRS score as a robust predictor of poorer sleep quality (β = 0.68, p =0.001), explaining a significant portion of the variance (Adjusted R^2 = 0.493). Age, gender, and duration of illness did not significantly predict PSQI scores in this model.

Conclusion

Poor sleep quality is present among adult MDD out-patients. Significant association between sleep quality disturbance and depression severity could be established.

Keywords

Hamilton Depression Rating Scale, Major Depressive Disorder, Nepal, Pittsburgh Sleep Quality Index, Sleep Disturbances, Depression Severity, In-patients

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INTRODUCTION

Major Depressive Disorder (MDD) is a globally prevalent and burdensome mental illness, characterized by persistent low mood, anhedonia, and a constellation of affective, cognitive, and somatic symptoms.[1] Among the most common and distressing somatic complaints are disturbances in sleep architecture and continuity, encompassing difficulties initiating or maintaining sleep (insomnia) or, less frequently, excessive sleepiness (hypersomnia).[2] Indeed, sleep disturbance is recognized not merely as a symptom but as intrinsically and bidirectionally linked with depression: impaired sleep can precipitate or worsen depressive episodes, while the

neurobiological changes in depression frequently disrupt normal sleep patterns.[3]

Persistent sleep disturbances in individuals with MDD carry significant consequences, including poorer response to antidepressant treatments, an elevated risk of relapse and recurrence, marked impairments in daytime cognitive function and occupational performance, diminished overall quality of life, and potentially an increased vulnerability to suicidal ideation.[4,5] Recognizing the profound impact of sleep on the course and outcome of MDD, a thorough understanding of sleep problem characteristics within specific clinical populations is paramount for effective care.

International studies consistently report high rates of sleep complaints among individuals with MDD, often exceeding 80%.[6] However, research from low- and middle-income countries (LMICs) like Nepal remains comparatively limited. In Nepal, the mental healthcare system faces considerable challenges, including resource constraints, a scarcity of specialized professionals, and significant stigma surrounding mental illness, which may influence clinical presentations and access to care.[7,8] Consequently, specific clinical issues like sleep quality might be under- recognized and inadequately addressed in routine practice.

The Pittsburgh Sleep Quality Index (PSQI) is a widely adopted and validated self-report instrument designed to assess subjective sleep quality over the previous month, providing both a global score and component scores detailing various facets of sleep disturbance.[9] The Hamilton Depression Rating Scale (HDRS) continues to be a benchmark clinician-rated scale for quantifying the severity of depressive symptoms, incorporating items that touch upon sleep.[10]

Despite the established clinical importance, there is a paucity of data specifically examining the prevalence and correlates of sleep disturbances among MDD patients in the context of eastern Nepal. This study was therefore undertaken to address this knowledge gap by evaluating the prevalence, severity patterns, and associated clinical factors of sleep disturbances in adult MDD patients attending Psychiatry OPD. Our primary objective was to elucidate the relationship between subjective sleep quality (PSQI scores) and depression severity (HDRS scores), alongside other relevant demographic and clinical variables.

MATERIAL AND METHODS

General Objectives

To evaluate sleep quality in adults with Major Depressive disorder

Specific Objectives

1. To measure sleep quality using Pittsburgh Sleep Quality Index (PSQI).
2. To study correlation between Sleep Quality, Depression Severity, and Duration of Illness.
3. To identify factors predicting the severity of sleep quality disturbance.

Study Design A descriptive, cross-sectional study methodology was employed.

Study Setting and Period The research was conducted within the outpatient facilities of the Department of Psychiatry, at a tertiary care center in Biratnagar, Nepal. Participant enrollment and data collection spanned a 12-month period from August 1, 2023, to July 31, 2024.

Study Population and Sampling Technique The target population consisted of adult patients (≥18 years) attending to psychiatry out-patient department who received a primary diagnosis of Major Depressive Disorder according to DSM-5 criteria, confirmed by a consultant psychiatrist. Exclusion criteria included the presence of severe comorbid medical conditions known to independently disrupt sleep, a pre-existing diagnosis of a primary sleep disorder (e.g., obstructive sleep apnea), or a current substance use disorder (excluding nicotine dependence) that could significantly confound sleep assessment. A total of 110 eligible patients who provided voluntary informed consent were recruited into the study using a purposive sampling strategy. The sample size was estimated based on an anticipated prevalence of poor sleep quality (PSQI > 5) of around 70% in MDD populations,[11] targeting a 95% confidence interval, an 8% margin of error, and allowing for potential incomplete data, leading to the target of 110 participants.

Data Collection Tools

Structured Proforma: A specifically designed proforma gathered essential socio- demographic data (age, gender, education level, marital status) and key clinical information (duration of the current depressive episode, total duration of illness, history of prior episodes, current psychotropic medication regimen). No questions related to sleep were included in this proforma.

Hamilton Depression Rating Scale (HDRS): The 17-item version of the HDRS was administered by a trained researcher (psychiatry resident involved in the study) to evaluate the severity of depressive symptoms experienced over the preceding week. Scores range from 0-52, with higher scores denoting greater depression severity.[10]

Pittsburgh Sleep Quality Index (PSQI): Participants completed this self-report questionnaire assessing subjective sleep quality and disturbances during the past month. The PSQI comprises 19 items that yield seven component scores related to subjective quality, latency, duration, efficiency, disturbances, medication use, and daytime dysfunction. These components sum to a global PSQI score (range 0-21), where a score greater than 5 signifies clinically relevant poor sleep quality.[9]

Ethical Considerations The study protocol received formal ethical approval from the Institutional Review Committee (IRC) of Birat Medical College and Teaching Hospital. All participants were provided with a detailed explanation of the study's objectives, procedures, voluntary nature of participation, and confidentiality measures. Written informed consent was obtained prior to data collection. Anonymity was maintained throughout the data handling and analysis process.

Statistical Analysis Collected data were entered, coded, and analyzed using IBM SPSS Statistics for Windows, Version 23.0. Descriptive statistics including means, standard deviations (SD), frequencies, and percentages were employed to summarize the sample's characteristics and key variable distributions (HDRS, PSQI scores). Independent samples t-tests were utilized to compare mean PSQI scores between relevant subgroups (e.g., males versus females). Pearson's correlation coefficient (r) was computed to examine the linear associations between continuous variables, primarily focusing on the relationship between PSQI global scores and HDRS total scores, and duration of illness. A multiple linear regression analysis was performed to identify significant predictors of sleep quality (with PSQI global score as the dependent variable), entering HDRS total score, age, gender (coded dichotomously), and duration of illness as independent variables. Statistical significance was set at a p-value threshold of 0.05.

RESULTS

The study successfully enrolled 110 patients fulfilling the inclusion criteria.

Socio-demographic and Clinical Characteristics: Table 1 presents the baseline characteristics of the study participants. The mean age was 38.5 years (SD = 11.5). Gender distribution was equal, with 55 males (50.0%) and 55 females (50.0%). Participants reported a mean duration of their current depressive illness episode of 9.1 months (SD = 4.2). The sample exhibited moderate to severe depression levels, reflected by a mean total HDRS score of 20.5 (SD = 6.1).

Prevalence and Severity of Sleep Quality Disturbances: Sleep quality assessment via the PSQI indicated widespread and significant sleep problems within the cohort (Table 2). The mean global PSQI score was notably high at 12.8 (SD = 4.5). Applying the established cutoff (>5), the vast majority of patients, 86 out of 110 (78.2%), were categorized as experiencing poor sleep quality.

Correlation between Sleep Quality, Depression Severity, and Duration of Illness: The relationship between key continuous variables was explored using Pearson's correlation (Table 3). A strong, positive, and highly statistically significant correlation was observed between the global PSQI score and the total HDRS score ($r = 0.68$, $p = 0.001$), confirming that greater depression severity was strongly associated with poorer subjective sleep quality. However, the correlation between the global PSQI score and the reported duration of illness did not reach statistical significance ($r = 0.15$, $p = 0.118$).

Predictors of poor sleep quality: To identify factors predicting poor quality of sleep, a multiple linear regression analysis was conducted with the global PSQI score as the outcome variable (Table 4). The overall regression model demonstrated a good fit and was highly significant ($F(4, 105) = 27.35$, $p = 0.001$), accounting for approximately 49.3% of the variance in PSQI scores (Adjusted $R^2 = 0.493$). Within the model, the total HDRS score emerged as the sole significant predictor, showing a strong positive association with the PSQI global score ($\beta = 0.68$, $t = 7.89$, $p = 0.001$). This indicates that higher levels of depression severity independently predicted worse reported sleep quality. Neither age, gender, nor duration of illness demonstrated a statistically significant predictive relationship with PSQI scores in this multivariate analysis ($p > 0.05$ for all).

A total of 24 (68.6%) cases were referred by doctors and 20 (57.1%) cases visited for reasons other than for enuresis. A total of 19 (54.3 %) cases had a positive family history of

enuresis, with 25 (71.4 %) cases without any significant birth history. The mean age of initiation of toilet training was 2.9 (SD± 1.3) years. About the treatment history, 29 (82.9 %) cases hadn't received any previous treatment for enuresis. About the type of enuresis 34 (97.1 %) cases were having primary enuresis with 30 (85.7%) cases having monosymptomatic symptoms. Co-morbid encopresis was found in 4 (11.4%) cases. Psychiatry co-morbidity was found in 15 (42.9%) cases. Among the psychiatric co-morbidities 4 cases (11.4 %) had Anxiety disorder and 4 (11.4 %) had Attention Deficit Hyperactivity Disorder. (Table 2)

Table 1: Demographic and clinical characteristics of the study sample (N=110)

Variable	Value
Mean Age (years) ± SD	38.5 ± 11.5
Gender (Male/Female)	55 (50%) / 55 (50%)
Mean Duration of Illness (months) ± SD	9.1 ± 4.2
Mean HDRS Score ± SD	20.5 ± 6.1

Table 2: Prevalence and Severity of Sleep Disturbances based on PSQI (N=110)

Sleep Quality Indicator	Frequency	Percentage (%)	Mean ± SD (if applicable)
Poor Sleepers (PSQI > 5)	86	78.2%	
Good Sleepers (PSQI ≤ 5)	24	21.8%	
Mean Global PSQI Score ± SD	-	-	12.8 ± 4.5

Table 3: Correlation between PSQI score, HDRS score, and Duration of Illness

Variables Correlated	Correlation Coefficient (r)	p-Value
PSQI Global Score & HDRS Score	0.68	0.001
PSQI Global Score & Duration of Illness	0.15	0.118

Table 4: Multiple Linear Regression analysis predicting Global PSQI Score

Predictor Variable	Unstandardized Coefficient (B)	Standard Error (SE)	Standardized Coefficient (β)	t-Statistic	p-Value
(Constant)	3.15	1.28		2.46	0.016
HDRS Total Score	0.55	0.07	0.68	7.89	0.001
Age (years)	-0.02	0.03	-0.05	-0.75	0.457
Gender (Male = 0, Female=1)	0.41	0.61	0.04	0.67	0.504
Duration of Illness (months)	0.08	0.08	0.07	1.03	0.306

DISCUSSION

This study provides valuable insights into the burden of sleep quality disturbance among adult patients receiving treatment for Major Depressive Disorder at a tertiary center in eastern Nepal. Our findings clearly demonstrate that poor sleep quality is not just common but pervasive in this clinical population, affecting over three-quarters (78.2%) of the participants. The mean PSQI score of 12.8 significantly exceeds the threshold for poor sleep and indicates substantial subjective distress related to sleep across multiple domains. This high prevalence aligns well with findings from the international literature, reinforcing the status of sleep disturbance as a cardinal feature of moderate-to-severe MDD requiring focused care.[6,12]

The central finding of our investigation is the robust positive correlation and significant predictive power of depression severity (measured by HDRS) on sleep quality (measured by PSQI). Individuals experiencing more severe depressive symptoms reported markedly poorer sleep. This strong coupling resonates with current neurobiological models suggesting shared pathways and reciprocal influences between mood regulation and sleep-wake systems.[3,13] The strength of this association underscores the clinical importance of viewing sleep problems not as an isolated issue but as deeply intertwined with the overall severity and potentially the underlying mechanisms of depression. This relationship implies that monitoring changes in sleep quality could offer valuable clues about the trajectory of depressive symptoms, and vice versa.

Interestingly, while chronicity is often linked to poorer outcomes in MDD,[14] our regression analysis did not identify the duration of illness as a significant predictor of current sleep quality when controlling for the current severity of depression. Similarly, neither age nor gender emerged as significant predictors in our multivariate model. Although some population-based studies report gender differences in sleep patterns or insomnia prevalence,[15] our findings suggest that within this specific cohort of MDD patients, the profound impact of the depressive episode itself on sleep may overshadow potential demographic influences on subjective sleep reporting.

These findings carry substantial clinical implications for psychiatric practice in Nepal and similar settings. The exceedingly high rate of severe sleep quality disturbance mandates that a systematic assessment of sleep becomes a routine component of the psychiatric evaluation for every MDD patient. Relying on brief questioning alone may fail to capture the multifaceted nature and severity of the sleep problem. Employing validated instruments to measure

sleep quality like the PSQI can facilitate a more structured and comprehensive assessment. Although potent link between depression severity and poor quality of sleep could be established, the relation could be bidirectional and more detailed studies should be done to establish a casual relationship. Furthermore, the potent link between poor sleep and depression severity suggests that pharmacotherapy specifically targeting sleep disturbance should be strongly considered. Addressing sleep may not only alleviate patient distress but could also potentially enhance the efficacy of standard antidepressant treatments and contribute to a more robust recovery.[4,5]

LIMITATIONS

Several limitations should be considered when interpreting these results. Firstly, the cross-sectional nature of the study precludes inferences about causality; the relationship between sleep and depression is undoubtedly complex and likely bidirectional. Secondly, conducting the study at a single tertiary care center might limit the generalizability of the findings to primary care settings, community populations, or patients with milder forms of depression. Thirdly, the use of purposive sampling introduces a potential for selection bias, although efforts were made to recruit consecutive eligible patients. Fourthly, the PSQI relies on subjective recall over the past month, which can be influenced by current mood state and recall accuracy. Objective sleep assessment methods (e.g., actigraphy, polysomnography) were not feasible for this study but could provide complementary data in future research. Lastly, while major confounders were excluded, residual confounding from undiagnosed comorbid conditions or the specific effects of diverse psychotropic medications could not be entirely ruled out.

FUTURE DIRECTIONS

Prospective longitudinal studies are warranted to track the dynamic interplay between sleep quality and depressive symptoms throughout the course of treatment and recovery. recovery. Intervention research is needed to evaluate the feasibility and effectiveness of evidence-based sleep therapies (particularly Cognitive Behavioral Therapy for Insomnia) adapted for the Nepalese cultural and healthcare context. Integrating objective sleep measures in future studies would offer a more comprehensive assessment.

CONCLUSION

This study confirms the presence of poor sleep quality among patients being treated for Major Depressive Disorder at tertiary care hospital in Biratnagar. Poor sleep quality was found to be associated with severity of depression but not with duration of depression.

CONFLICT OF INTEREST

None declared.

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