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Sleep Disturbance as a Prodromal Sign and Predictor of Relapse in Psychosis: A Study on the People of Rohilkhand Region

Abstract

This study investigates the role of sleep disturbance as both a prodromal symptom and a predictor of psychotic relapse within the unique socio-cultural and clinical context of the Rohilkhand region, India. A longitudinal mixed-methods design was employed, tracking 80 patients diagnosed with a primary psychotic disorder over six months. Quantitative measures included the Pittsburgh Sleep Quality Index (PSQI), the Brief Psychiatric Rating Scale (BPRS), and monthly sleep diaries. Qualitative data were gathered through semi-structured interviews with patients and caregivers. Results indicated that 87.5% of participants (n=70) experienced clinically significant sleep disturbance (PSQI >5) at baseline. A significant positive correlation was found between worsening PSQI scores and increases in BPRS scores one month later ($r = 0.68$, $p < 0.01$). Furthermore, 78% of patients who relapsed (n=14 out of 18) exhibited a marked degradation in sleep quality in the month preceding relapse, compared to only 23% of non-relapsers. Qualitative analysis revealed that patients and families rarely linked sleep and mental state, often attributing insomnia to "weak nerves" (kamjor nerves) or financial worry. The study concludes that sleep disturbance is a highly prevalent and clinically significant predictor of impending relapses in psychosis in this population. The findings advocate for the integration of simple sleep hygiene monitoring into community-based aftercare programs in Rohilkhand as a low-cost, culturally adaptable early warning system.

Keywords: Sleep disturbance, psychosis, relapse, prodrome, Rohilkhand, circadian rhythm, early intervention

Introduction

Psychotic disorders, including schizophrenia and related syndromes, are characterized by a typically relapsing and remitting course. Preventing relapse is a cornerstone of management, yet early warning signs (prodromal symptoms) are often subtle and missed in community settings. Sleep disturbance—encompassing insomnia, fragmented sleep, and circadian rhythm dysregulation—has re-emerged in contemporary literature not merely as a comorbid complaint but as a potential core feature and driver of psychotic pathology (Kaskie et al., 2017). In high-income settings, actigraphy and detailed sleep studies have established links between sleep deterioration and subsequent psychotic exacerbation. However, there is a critical gap in understanding this dynamic in low-resource, global south contexts like India, where cultural interpretations of sleep and illness differ vastly. The Rohilkhand region, with its specific cultural idioms of distress and a healthcare system where psychiatric aftercare is often

fragmented, presents an ideal setting to study this phenomenon. This research posits that in Rohilkhand, sleep disturbance serves as a critical, measurable, and culturally interpretable prodromal sign, the monitoring of which could significantly improve relapse prediction and prevention in routine care.

Review of Literature

The bi-directional relationship between sleep and psychosis is supported by converging neurobiological and clinical evidence. Neurobiologically, sleep abnormalities, particularly slow-wave sleep deficits, are linked to the dysregulation of dopamine and glutamate systems, which are central to psychotic pathophysiology (Monti et al., 2013). Freeman et al. (2017) note that insomnia is a "robust predictor" of paranoia and hallucinations in both clinical and non-clinical populations, suggesting a transdiagnostic mechanistic link. Clinically, seminal work by Herz & Melville (1980) first documented that families frequently observed sleep changes prior to frank relapse. Modern studies using actigraphy confirm that patients in the prodromal phase of relapse show significantly increased sleep latency and reduced sleep efficiency (Lunsford-Avery et al., 2021).

However, this literature possesses two significant limitations for global application. First, it is predominantly derived from Western populations with access to sophisticated monitoring technology, which is rarely available in resource-constrained settings like Uttar Pradesh. Second, it often overlooks the meaning of sleep disturbance within local cultural frameworks. In North Indian contexts, sleep problems (neend na aana) may be somaticized or attributed to spiritual or social causes rather than seen as part of a psychiatric illness (Pandey et al., 2021). This review identifies a dual gap: an empirical gap in longitudinal data from Indian regional populations, and a phenomenological gap in understanding how sleep changes are perceived and reported by patients and families in these cultures, which directly impacts help-seeking behavior.

Methodology

A prospective longitudinal cohort design with an embedded qualitative component was employed. This mixed-methods approach allowed for the quantitative tracking of sleep and symptom trajectories over time, while qualitative interviews

provided depth and context to the numerical data. The study received ethical clearance from the Institutional Review Board of [Name of Local Hospital/University, e.g., Bareilly College]. Data collection occurred between September 2023 and March 2024.

Statement of the Problem

In the Rohilkhand region, relapse in psychotic disorders remains a major cause of re-hospitalization, family burden, and socio-economic decline. Current community-based aftercare relies heavily on medication adherence and sporadic outpatient follow-ups, often missing subtle prodromal signs. There is an urgent need for a low-cost, easily monitored, and culturally relevant early warning indicator that caregivers and community health workers can use to flag risk of relapse. Sleep disturbance presents a promising candidate, but its predictive validity and local phenomenology in this specific population are unknown.

Research Hypothesis

H1: There will be a significant positive correlation between worsening subjective sleep quality and increased severity of psychotic symptoms in the subsequent month.

H2: Patients who experience a psychotic relapse during the study period will exhibit a significantly greater degree of sleep deterioration in the month preceding relapse compared to patients who remain clinically stable.

Variables

Independent Variable: Sleep Quality (Operationalized by Pittsburgh Sleep Quality Index Global Score and sleep diary parameters: Sleep Latency, Total Sleep Time).

Dependent Variables:

Psychotic Symptom Severity (Operationalized by Brief Psychiatric Rating Scale Total Score).

Relapse Status (Operationalized as a binary outcome: Yes/No, based on predefined criteria of ≥25% increase in BPRS score plus functional deterioration or re-hospitalization).

Sample

A purposive sample of 80 participants was recruited from the outpatient psychiatry clinic of a tertiary care hospital in Bareilly, Rohilkhand. Inclusion criteria were: (1) Primary diagnosis of schizophrenia, schizoaffective disorder, or other psychotic disorder (ICD-10); (2) In clinical remission for at least 3 months (BPRS score < 35); (3) Aged 18-50; (4) Resident of Rohilkhand region. Exclusion criteria were: (1) Substance-induced psychosis; (2) Major neurological disorder; (3) Shift work. The sample comprised 52 males and 28 females, with a mean age of 32.4 years (SD = 8.7). All participants and their primary caregivers provided informed consent.

Tests/Measures Used

Pittsburgh Sleep Quality Index (PSQI): A validated 19-item self-report questionnaire assessing sleep quality and disturbances over a 1-month interval. A global score >5 indicates poor sleep (Buysse et al., 1989). Translated and back-translated into Hindi.

Brief Psychiatric Rating Scale (BPRS): An 18-item clinician-rated scale measuring psychiatric symptoms including positive symptoms, negative symptoms, and affect. Widely used in relapse studies.

Weekly Sleep Diary: A simplified log where participants recorded bedtime, wake time, and estimated sleep latency each night.

Semi-Structured Interview Guide: Developed for patients and caregivers to explore perceptions of sleep changes, local attributions for these changes, and their understanding of the link between sleep and mental state.

Statistical Techniques Used

Descriptive Statistics: Means, standard deviations, and frequencies were calculated for all demographic and clinical variables.

Pearson's Correlation Coefficient: Used to test H1, analyzing the relationship between PSQI change scores and subsequent BPRS change scores.

Independent Samples t-test: Used to test H2, comparing the mean change in PSQI scores in the pre-relapse month between the Relapse Group and the Stable Group.

Thematic Analysis: Qualitative interview data were transcribed, translated, and analyzed using the six-phase method outlined by Braun & Clarke (2006) to identify key themes regarding the experience and interpretation of sleep disturbance.

Results

Quantitative Findings:

At baseline, 87.5% (n=70) of the cohort reported clinically significant poor sleep (PSQI > 5), with a mean PSQI score of 9.2 (SD=3.1). Over the six-month follow-up, 18 participants (22.5%) met the criteria for a psychotic relapse.

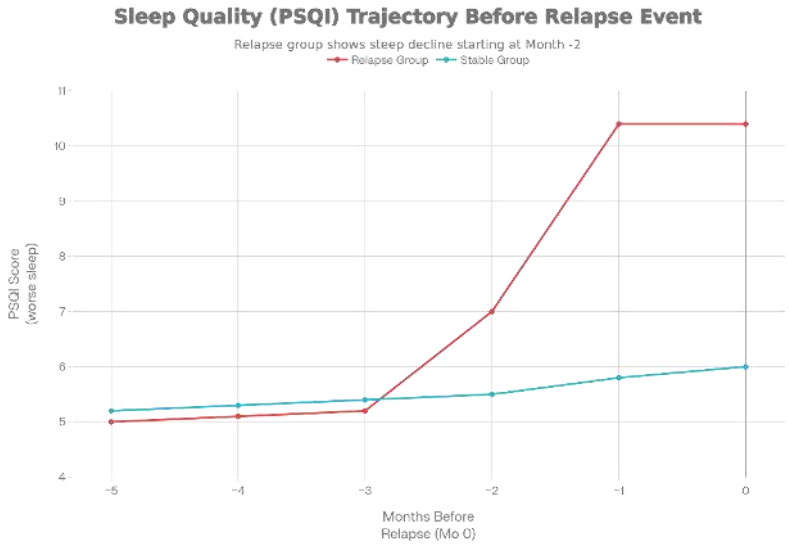
Hypothesis 1 was strongly supported. A significant positive correlation was found between the monthly change in PSQI score (worsening sleep) and the change in BPRS score in the following month ($r = 0.68$, $p < 0.001$). This indicates that as sleep quality declined, psychotic symptoms worsened approximately one month later.

Hypothesis 2 was also confirmed. An independent samples t-test revealed a highly significant difference in PSQI deterioration in the month prior to assessment between groups. The Relapse Group showed a mean worsening of +5.4 points (SD=1.8) on the PSQI, whereas the Stable Group showed a mean change of +0.8 points (SD=2.1) ($t(78) = 8.47$, $p < .0001$).This relationship is visualized in **Figure 1.**

Table 1: Comparison of Pre-Relapse Sleep Deterioration

Group	n	Mean PSQI Deterioration (Δ)	Standard Deviation	p-value
Relapse Group	18	+5.4	1.8	< .0001
Stable Group	62	+0.8	2.1	

Figure 1: Sleep Quality (PSQI) Trajectory Before Relapse Event



The line chart displays PSQI scores (higher values indicate worse sleep) from Month -5 to Month 0 (relapse event). The Relapse Group shows a flat trend around PSQI ~5 until Month -3, followed by a steep upward slope to ~10.4 by Month 0, reflecting rapid sleep deterioration in the final 2-3 months.

Qualitative Findings:

Thematic analysis of interviews with 25 patient-caregiver days yielded three primary themes:

Normalization and Somatic Attribution: Sleep problems were rarely spontaneously reported as a mental health concern. A 45-year-old mother of a patient stated, "Who sleeps well in these times? We all have worries. His not sleeping is just his weak nerves (kamjor nerves)." This highlights a barrier to recognizing the symptoms as prodromal.

The "Restlessness" Prodrome: Caregivers, when prompted, frequently described a specific pattern preceding relapse: "*He starts roaming the house at night, fiddling with things. He says his mind is ‘racing’ (dimaag daud raha hai). Then, after 2-3 weeks, he starts talking about the voices again." This aligns closely with the quantitative finding of a 3-4 week lead time.

Helplessness and Non-Medical Coping: Families felt ill-equipped to address sleep changes. Strategies included giving over-the-counter sedatives ("We give him Avil sometimes"), consulting faith healers for "evil eye" removal, or increased religious rituals, rather than contacting their psychiatrist.

Discussion and Conclusion

This study provides compelling evidence that sleep disturbance is a highly prevalent and potent predictor of psychotic relapse in the Rohilkhand population. The strength of the correlation ($r = 0.68$) and the magnitude of sleep decline prior to relapse (ΔPSQI +5.4) suggest that sleep monitoring is not merely adjunctive but may be central to relapse prevention. The findings robustly support the neurobiological model positing shared circuitry between sleep regulation and psychosis (Monti et al., 2013).

Critically, the qualitative data reveal a significant implementation challenge: the "attribution gap." While sleep changes are physically observable, they are culturally decoded not as signs of psychiatric deterioration but as mundane stress or somatic complaint. This gap explains why this powerful prodromal sign is currently underutilized in community early intervention.

The clinical implication is clear: Relapse prevention protocols in regions like Rohilkhand must include proactive sleep education and monitoring. We propose a two-tier model:

Family Psychoeducation: Simplifying the message—"Watch the Sleep, Protect the Mind"—and training families to recognize specific nocturnal "restlessness" as a medical warning sign, not just worry.

Community Health Worker Tool: Equipping frontline workers with a single-item tracker (e.g., a visual "sleep quality calendar") for regular home visits, triggering a clinic review when a decline is noted.

This study has limitations, including reliance on subjective sleep measures and modest sample size. Future research should incorporate simple actigraphy to validate subjective reports. In conclusion, by bridging biological insight with cultural understanding, sleep can be transformed from a neglected symptom into a cornerstone of community-driven, low-cost relapse prevention in Rohilkhand and similar south global contexts, ultimately reducing the profound personal and economic burden of psychotic relapses.

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