

Sleep Quality in Patients With Schizophrenia in a Tertiary Care Center in Northern India

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Abstract

Objective: To assess the quality of sleep among patients with schizophrenia.

Methods: A cross-sectional descriptive study was conducted with 100 outpatients with schizophrenia recruited from a tertiary care center in Northern India from July 2022 to December 2022. Eligible participants were required to complete a demographic form, the Pittsburgh Sleep Quality Index (PSQI), and the Insomnia Severity Index (ISI). The severity of psychosis was assessed with the Positive and Negative Syndrome Scale (PANSS). **Results:** The mean age of the participants was 38.87 years (SD=10.564). The prevalence of poor sleep quality (PSQI \geq 5) among the patients with schizophrenia was 78%, and the mean PSQI score was 11.2 (SD=5.31). Most of the participants in whom the prevalence of poor sleep quality was marginally higher were female (51%). Of the 7 PSQI components, daytime dysfunction was more affected (49%) compared to the other 6 components. There was a positive correlation between PSQI and ISI scores (r=0.805, P<.001). PSQI (U=380, P<.001) and ISI scores (U=517, P<.001) were significantly lower in schizophrenia patients taking benzodiazepines. The PANSS scores were not significantly correlated with PSQI or ISI scores.

Conclusions: Most patients with schizophrenia suffered significantly from poor sleep quality. The results showed the deleterious impact of poor sleep on their daytime functioning, suggesting the need for comprehensive management of sleep problems in such patients.

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Schizophrenia is a chronic mental disorder that affects cognition, emotions, perception, and other aspects of behavior.^{1,2} The hallmark of schizophrenia is a significant loss of contact with reality in terms of delusions, hallucinations, disorganized speech, and negative symptoms.³ Sleep quality is mostly described as satisfaction with the sleep experience as well as the incorporation of sleep initiation, maintenance, quantity, and feeling refreshed upon awakening.⁴

Sleep disturbance is a commonly reported complaint in patients with schizophrenia.^{5,6} Sleep disturbance in schizophrenia can be attributed to various reasons such as neurobiology and alterations in the sleep-wake cycle, as part of negative symptoms, and psychotropics.⁷ Sleep patterns in schizophrenia are inconsistent. These inconsistencies range from decreased sleep at night to increased daytime sleepiness, various polysomnographic changes, and multiple intermittent awakenings.^{8–11}Also, research is lacking regarding sleep disturbances in schizophrenia.¹⁰ Therefore, the objective of this study was to assess quality of sleep among patients with schizophrenia and to examine whether sleep quality varies with psychopathology.

METHODS

A cross-sectional descriptive study was conducted to assess the quality of sleep among patients with schizophrenia. The minimum sample size calculated for the study was 100. Outpatients were recruited from the Department of Psychiatry, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, India, from July 2022 to December 2022. This study is registered in the Clinical Trials Registry India (CTRI-2021-08-035427). The study protocol was approved by the institute ethics committee (SGRR/IEC/23/21, IEC registration no. ECR/710/Inst/UK/2015/RR18).





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Clinical Points

- Insomnia is commonly reported in patients with schizophrenia.
- Antipsychotics may improve sleep quality due to their sedative properties.
- Benzodiazepines may help improve sleep quality and control agitation, though short-term use is recommended.

Sample

Inclusion criteria included (1) patients meeting the diagnostic criteria for schizophrenia using the *ICD-10* Diagnostic Criteria for Research and (2) age range of 18–59 years. Psychiatric evaluations were conducted by a psychiatrist (S.G.) for this study.

Exclusion criteria included (1) patients with other comorbid psychiatric disorders, (2) those who had been diagnosed with alcohol or any other substance use disorder, and (3) night shift workers. The data were collected with the help of a predesigned questionnaire consisting of sociodemographic details.

Scales

Pittsburgh Sleep Quality Index (PSQI). The PSQI was used to assess sleep quality.¹² It differentiates poor sleep from good sleep by measuring 7 items: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction during the last month. Scoring of answers is based on a Likert scale of 0–3, whereby 3 reflects the negative extreme on the scale. A total score ≥ 5 indicates poor sleep. The 7 component scores of the PSQI had an overall reliability coefficient (Cronbach α) of 0.83, with 89.6% sensitivity and 86.5% specificity. The PSQI can be used to screen patients for the presence of significant sleep disturbance. It may identify patients who are likely to have sleep disturbances concomitant with psychiatric disturbances.¹²

Insomnia Severity Index (ISI). The ISI is a 7-item self-report questionnaire assessing the nature, severity, and impact of insomnia.13 The usual recall period is the "last month," and the dimensions evaluated are severity of sleep onset, sleep maintenance, early morning awakening problems, sleep dissatisfaction, interference of sleep difficulties with daytime functioning, noticeability of sleep problems by others, and distress caused by sleep difficulties. A 5-point Likert scale is used to rate each item (eg, 0 =no problem, 4 =very severe problem), yielding a total score ranging from 0 to 28. The total score is interpreted as follows: absence of insomnia (0-7), subthreshold insomnia (8-14), moderate insomnia (15-21), and severe insomnia (22-28). The cutoff score for clinical insomnia is 15.13 Three versions are available-patient, clinician, and significant others-but

the current study focused on the patient version only. Internal consistency is Cronbach α = .90. A cutoff score of 10 had 86.1% sensitivity and 87.7% specificity for detecting insomnia cases in the community sample.¹³

Positive and Negative Syndrome Scale (PANSS). The PANSS comprises 30 items. These items are subdivided into 3 scales: positive, negative (each having 7 items), and general psychopathology scale (16 items). Each item is given a score from 1 to 7 based on the 7-point-Likert scale (1: no symptom, 7: severe symptoms). Total PANSS scores range from 30 to 210.¹⁴

Statistical Analysis

All collected data were tabulated and analyzed by using the Statistical Package for the Social Sciences version 28. The sociodemographic profiles of the whole sample, those with poor sleep quality (PSQI \geq 5) and those without (PSQI < 5), are presented as frequency and percentage. Additionally, analyses of each domain of the PSQI of the total sample are presented as proportions and continuous scores. Correlation statistics between chlorpromazine-equivalent dose and PSQI and ISI scores were studied, as were comparison of PANSS scores across the categories of PSQI and ISI domains.

RESULTS

One hundred patients with schizophrenia were included in the study. The mean age of the participants was 38.87 years (SD = 10.564). The prevalence of poor sleep quality (PSQI \geq 5) among the patients with schizophrenia was 78%, and the mean PSQI score was 11.20 (SD = 5.311). Table 1 shows the participants' sociodemographic characteristics based on their sleep quality (good vs poor). There was a slight majority of female participants with equal sex distribution among poor sleepers. Those with good versus poor sleep quality differed significantly in the proportion of benzodiazepine use (see Table 1).

Clinical Measures

Of the 7 components of the PSQI, the mean score for daytime dysfunction was higher (49%) compared to the other 6 components. On the component of subjective sleep quality, 46% of patients reported very bad sleep quality. On the component of sleep latency, 37% of patients reported good sleep, while 31% of patients reported very prolonged sleep latency. On the component of sleep duration, around 33% of patients reported sleeping for 6 to 7 hours per night. Around 34% of patients reported sleep disturbance in less than a week, and 77% of patients were not on psychotropic medication. About 42% of the patients had no clinical insomnia, according to the ISI (Table 2). There was a significant positive correlation of the PSQI with the ISI (r = 0.805, P < .001). Chlorpromazineequivalent dose did not correlate significantly with the PSQI (r = -0.025, P = .801) or ISI (r = -0.033,

Table 1.

Comparison of Sociodemographic and Clinical Profiles of the Total Sample, Those With Poor Sleep Quality, and Those Without Poor Sleep Quality^a

Variable	Total Sample (N = 100)	With Poor Sleep Quality (N = 78) ^b	Without Poor Sleep Quality (N = 22)°	χ²/t	df	P°
Age, mean (SD), y	34.87 (10.564)	35.71 (10.940)	31.91 (8.680)	713.50 ^d	33	.229
Age at onset, mean (SD), v	26.29 (5.689)	26.63 (5.461)	25.09 (6.428)	716.50 ^d	33	.238
Duration of illness, mean (SD), v	8.48 (7.688)	8.97 (8.259)	6.73 (4.939)	754.50 ^d	33	.388
PSQI score, mean (SD)	11.20 (5.311)	13.29 (4.313)	4.09 (0.811)	46.842	98	.001*
Chlorpromazine equivalent mean (SD)	226 25 (182 82)	231 73 (190 17)	206 82 (156 44)	0 764	98	575
		2011/0 (100117)				
Male	49 (49 0)	38 (48 7)	11 (50 0)	0 011	1	1 000
Female	51 (51.0)	40 (51.3)	11 (50.0)			
Education						
Primary	18 (18.0)	16 (20.5)	2 (9.1)	1.760	3	.637
Secondary	26 (26.0)	20 (25.6)	6 (27.3)			
Graduate	41 (41.0)	30 (38.5)	11 (50.0)			
Postgraduate	15 (15.0)	12 (15.4)	3 (13.6)			
Residence						
Urban	34 (34.0)	24 (24.0)	10 (10.0)	1.615	2	.489
Semiurban	45 (45.0)	37 (37.0)	8 (8.0)			
Rural	21 (21.0)	17 (17.0)	4 (4.0)			
Marital status						
Unmarried	51 (51.0)	37 (47.4)	14 (63.6)	1.754	2	.366
Married	46 (46.0)	38 (48.7)	8 (36.4)			
Separated/divorced	3 (3.0)	3 (3.8)	0 (0)			
Employment						
Never employed	50 (50.0)	41 (52.6)	9 (40.9)	5.947	4	.171
Currently unemployed	20 (20.0)	16 (20.5)	4 (18.2)			
Full-time employed	18 (18.0)	10 (12.8)	8 (36.4)			
Part-time employed	4 (4.0)	4 (5.1)	0 (0)			
Self-employed	8 (8.0)	7 (9.0)	1 (4.5)			
Socioeconomic status						
Low	27 (27.0)	24 (30.8)	3 (13.6)	3.859	2	.148
Middle	63 (63.0)	45 (57.7)	18 (81.8)			
High	10 (10.0)	9 (11.5)	1 (4.5)			
Family arrangement						
Joint	35 (35.0)	27 (34.6)	8 (36.4)	0.725	2	.821
Nuclear	62 (62.0)	49 (62.8)	13 (59.1)			
Alone	3 (3.0)	2 (2.6)	1 (4.5)			
Suicidal ideas	42 (42 0)	24 (20 7)	44 (50.0)	0 744	4	100
Present	42 (42.0)	31 (39.7)	11 (50.0)	0.741	1	.466
ADSENT	58 (58.0)	47 (60.3)	11 (50.0)			
	26 (26 0)	21 (20 6)	F (22 7)	0 157	1	700
Tes No	20 (20.0) 74 (74 0)	57 (73 1)	J (22.7) 17 (77.3)	0.137	1	.765
NU Drocont	29 (29 0)	24 (30.8)	5 (22 7)	0 928	2	681
Past psychiatric history	23 (23.0)	24 (30.0)	5 (22.7)	0.520	2	.001
Ahsent	54 (54.0)	40 (51.3)	14 (63.6)			
Inknown	17 (17.0)	14 (17.9)	3 (13.6)			
Benzodiazepine use						
Yes	74 (74.0)	52 (66.6)	22 (100)	9.91	1	.001*
No	26 (26.0)	26 (33.4)	0 (0)			
ISI categories						
No insomnia	42 (42.0)	21 (26.9)	21 (95.5)	33.4	3	.001*
Subthreshold insomnia	15 (15.0)	15 (19.2)	0 (0)			
Clinical insomnia (moderate)	29 (29.0)	29 (37.1)	0 (0)			
Clinical insomnia (severe)	14 (14.0)	13 (16.6)	1 (.05)			
^a Data presented as n (%) unless otherv ^b PSQI score ≥ 5. ^c PSQI score < 5. ^d Mann-Whitney U.	wise specified.					

^eBolding indicates statistical significance.

**P* < .01.

 $\label{eq:schemestress} Abbreviations: {\sf ISI=Insomnia}\ {\sf Severity}\ {\sf Index}, {\sf PSQI=Pittsburgh}\ {\sf Sleep}\ {\sf Quality}\ {\sf Index}.$

Table 2.

Analysis of PSQI Scores of Patients With Schizophrenia (N=100)

Variable	Category	Frequency (%)	Mean ± SD
Subjective	Very good	16	1.93±1.148
sleep quality	Fairly good	21	
	Fairly bad	17	
	Very bad	46	
Sleep latency	Very good	3	1.88±.891
	Fairly good	37	
	Fairly bad	29	
	Very bad	31	
Sleep	>7 h	19	1.52 ± 1.049
duration	6 to 7 h	33	
	5 to 6 h	25	
	<5 h	23	
Sleep	>85%	14	$1.50 \pm .937$
efficacy	75%–85%	39	
	65%–74%	30	
	<65%	17	
Sleep	Not during past month	13	$1.64 \pm .990$
disturbance	Less than a week	34	
	Once or twice a week	29	
	≥3 times a week	24	
Use of sleep	Not during past month	73	0.68 ± 1.254
medication	Less than a week	3	
	Once or twice a week	13	
	≥3 times a week	11	
Daytime	Not during past month/no problem	8	2.12±1.008
dysfunction	Less than a month/slight problem	21	
	Once or twice a month/somewhat a problem	22	
	\geq 3 times a week/a very big problem	49	
Abbreviation:	PSQI=Pittsburgh Sleep Quality Inde	х.	

P=.742). PSQI (U=380, P<.001) and ISI (U=517, P<.001) scores were significantly lower in patients with benzodiazepine use than in those without.

The distribution of positive, negative, and general scores of the PANSS was the same across categories as per the PSQI cutoff. No significant difference was found between PANSS scores and the ISI categories (Table 3).

DISCUSSION

Our findings are in line with a previous study¹⁵ that reported a high prevalence of poor sleep quality among patients with schizophrenia.¹⁶ In the current study, there was no significant association between PSQI scores and sociodemographic variables such as sex, age, marital status, and education level. In terms of sociodemographic variables, the results of the current study were consistent with previous studies.^{17–20} In contrast, Han et al¹⁹ stated that females may suffer from poor sleep quality more than males. Similar findings were reported in previous studies; that is, females were more likely to report sleep complaints.¹⁹

Dule and colleagues²¹ found no relation between age groups and sleep quality, which was echoed

Table 3.

Comparison of PANSS Scores Across the Categories of PSQI and ISI Domains

		PANSS		
Scale	Domain	Score	Р	
PSQI	Subjective sleep quality	1.096ª	.778	
	Sleep latency	0.880ª	.830	
	Sleep duration	5.653ª	.130	
	Sleep efficacy	1.010ª	.799	
	Sleep disturbance	1.071ª	.784	
	Use of sleep medication	796.500 ^b	.465	
	Daytime dysfunction	0.6760ª	.879	
	PSQI cutoff	964.500 ^b	.375	
ISI categories	PANSS-Total	1.342ª	.719	

^aKruskal-Wallis test values.

^bMann-Whitney U.

Abbreviations: ISI = Insomnia Severity Index, PANSS = Positive and Negative Syndrome Scale, PSQI = Pittsburgh Sleep Quality Index.

by the current study as well. However, studies done in China and Turkey reported that ages 15 to 21 years were significantly associated with poor sleep quality,^{22,23} which is in contrasted to our study.

We found a significant association in the disturbance in daytime functioning: 49.5% of patients experienced problems \geq 3 times a week, which is in line with a study by Sharma and colleagues.¹⁰ Our finding was higher than that of previous studies, possibly due to different study settings, sample sizes, tools used to assess sleep quality, and inclusion criteria of the study participants.

In recent years, more attention has been paid to the sleep quality of people with schizophrenia. It has been suggested that psychiatric symptoms have a greater influence on their sleep than cognitive deficits. Our study revealed no significant correlation between psychopathology scores and any of the subdomains of the PSQI. This finding is supported by a study from China,¹⁵ but is contrasted by a study by Dule and colleages,²¹ who concluded that poor sleep quality is high among people with schizophrenia. This discrepancy could partially be attributed to most of our study participants being at an acute stage of illness. Interestingly, in our study, a negative (though insignificant) correlation existed between poor sleep quality and insomnia severity with antipsychotic dose equivalence. This finding would suggest that antipsychotics promoted healthy sleep due to their sedative properties, although some antipsychotics are also known to worsen sleep quality and insomnia given their activating potential (eg, aripiprazole).²⁴ Also, benzodiazepine usage was associated with better sleep quality and lower insomnia in our sample. Though, as per a Cochrane analysis,²⁵ low-quality evidence supports short-term utility due to their sedative and calming effects.

The findings of this study have important clinical implications. They emphasize the necessity of understanding and treating not only the core symptoms of schizophrenia but also the primary factors influencing the quality of sleep over time. To adjust the clinician's goals to the patient's subjective needs, psychosocial intervention and rehabilitation programs should be directed to enhance daytime functioning, which improves feelings of self-efficacy, self-esteem, social support, or coping strategies, as well as to support patients and their caregivers. Future studies should examine the effect of cognitive impairment on the appraisal of the perceived quality of sleep among patients with schizophrenia.

The strength of the current study is that it is perhaps the only one that has been conducted to assess the quality of sleep using the PSQI in Northern India. There was an equal distribution concerning sex. However, this study has limitations. First, only clinically stable patients with schizophrenia from the main outpatient psychiatry department in Dehradun were recruited, so this finding may not apply to other parts of India and patients with different characteristics. Second, the nature of the study design cannot examine the causality relationship between sleep quality and the clinical variables. Finally, this study did not assess cognitiverelated function and its impact on the quality of sleep.

CONCLUSION

Most of the patients with schizophrenia in our study suffered significantly from poor sleep quality. The results show the deleterious impact of poor sleep on their daytime functioning, suggesting the need for comprehensive management of sleep problems in such patients. More qualitative studies are needed to explore the subjective quality of sleep and its determinants in schizophrenia.

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