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IMPACT OF SOCIAL MEDIA USE ON SLEEP QUALITY AND MENTAL HEALTH AMONG ADOLESCENTS IN RURAL KARNATAKA A DESCRIPTIVE CORRELATIONAL STUDY

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ABSTRACT

Background: The rapid proliferation of smartphones and social media platforms has transformed adolescent lifestyles globally, including in rural India where mobile internet penetration has surged following the Jio digital revolution. Aim: To assess the pattern of social media use among rural adolescents and examine its association with sleep quality (PSQI) and mental health (GHQ-12). Design: Descriptive correlational cross-sectional study. Setting: Rural villages and government schools, Dharwad district, Karnataka. Sample: 50 adolescents aged 13–19 years by purposive sampling. Tools: Bergen Social Media Addiction Scale (BSMAS), Pittsburgh Sleep Quality Index (PSQI), General Health Questionnaire-12 (GHQ-12), structured socio-demographic proforma. Results: Mean daily social media use 3.1 ± 1.8 hours; 44% at-risk on BSMAS (≥19); 64% poor sleep quality (mean PSQI 7.8 ± 2.4); 58% probable psychiatric caseness (GHQ-12 ≥4). Correlations: SM hours vs PSQI r=0.68 (p<0.001); SM hours vs GHQ-12 r=0.62 (p<0.001); PSQI vs GHQ-12 r=0.74 (p<0.001). Night-use group had significantly higher PSQI (9.4 vs 5.2; t=4.82, p<0.001). Conclusion: Social media use-particularly nocturnal usage-is strongly associated with poor sleep quality and compromised mental health among rural Karnataka adolescents.

INTRODUCTION

Social media platforms-including Instagram, YouTube, WhatsApp, Snapchat, and Facebook-have transformed the daily lives of adolescents worldwide. Globally, over 4.8 billion people use social media, with adolescents constituting the most intensive user group: approximately 90% of teenagers are active on at least one platform, spending an average of 3 hours daily on social media-related activities. The rapid expansion of affordable 4G/5G connectivity in rural India, accelerated by the Jio revolution (2016 onwards), has resulted in rural adolescents increasingly gaining access to smartphones and high-speed internet, often without the parental oversight and digital literacy frameworks that might mitigate potential harms. Karnataka is one of India's most digitally progressive states, yet significant urban–rural disparities persist in digital literacy, media supervision, and awareness of digital health risks. In rural Karnataka, the adolescent population-comprising students in government schools and children of agricultural and daily-wage labour families-now frequently accesses social media as a primary source of entertainment, peer connection, and identity formation. The consequences of this shift on adolescent sleep health and mental well-being remain insufficiently studied in the rural Indian context. Sleep is a fundamental physiological requirement for adolescent brain development, emotional regulation, and academic performance. Social media use contributes to inadequate sleep through multiple mechanisms: displacement of sleep time due to late-night scrolling, blue-light-mediated suppression of

melatonin production delaying sleep onset, and psychological arousal from emotionally stimulating content. The present study was designed to assess the pattern of social media use and examine its associations with sleep quality and mental health among rural adolescents in Karnataka, using validated psychometric tools.

NEED FOR THE STUDY

India has over 253 million adolescents (10–19 years), constituting approximately 18% of the total population. Karnataka alone has an estimated 10.8 million adolescents. The National Mental Health Survey of India (NMHS 2015–16) reported a prevalence of mental disorders of approximately 7.3% among adolescents, with anxiety and depressive disorders being the most common. More recent estimates, post-COVID-19, suggest substantially higher rates, driven by technology-mediated social isolation and escalating screen time. Rural adolescents face a unique convergence of risks: limited access to structured recreational activities, inadequate parental digital literacy, social media platforms algorithmically designed to maximise engagement, and a near-complete absence of school-based digital hygiene curricula. Despite rapidly increasing digital access, no published study has specifically examined the triangular relationship between social media use, sleep quality, and mental health among adolescents in rural Karnataka. The present study is therefore timely, contextually relevant, and carries direct implications for school health nursing practice, community health interventions, and public health policy development in Karnataka.

REVIEW OF LITERATURE

The following six literature reviews, synthesised from peer-reviewed publications (2020–2025), establish the evidence base for this study.

Review 1: Problematic Social Media Use and Mental Health in Adolescents-Meta-analysis (2022)

A systematic review and meta-analysis involving 9,269 participants across 18 studies established statistically significant correlations between problematic social media use and depression ($r=0.273$, $p<0.001$), anxiety ($r=0.348$, $p<0.001$), and stress ($r=0.313$, $p<0.001$). No significant heterogeneity by age, gender, or year of publication was found, suggesting consistent associations across diverse populations. Problematic social media use was identified as an independent risk factor for poor mental health in youth, directly informing the selection of BSMAS and GHQ-12 as outcome tools in the present study.

Review 2: Social Media Use and Mental Health of Indian Adolescents-Qualitative Study (2024)

A cross-sectional qualitative study involving 204 Indian adolescents aged 14–23 years documented that excessive social media use is strongly correlated with increased stress, anxiety, and depression. Adolescents engage in compulsive nighttime scrolling, directly disrupting sleep quality and leading to daytime fatigue, impaired concentration, and emotional dysregulation. The study highlighted the role of cyberbullying as an amplifier of mental health burden, particularly among female adolescents in socioeconomically disadvantaged settings-directly contextualising the present study within the Indian adolescent population.

Review 3-Social Media Use, Sleep Quality, and Mental Health in Youth-Systematic Review (2021)

A systematic review of 41 studies synthesised evidence on the interplay between social media use, sleep quality, and mental health in youth aged 12–25. Social media use was consistently associated with shorter sleep duration, delayed sleep onset, and poorer sleep quality-with the strongest effects for nighttime use. Sleep disruption was identified as a mediating pathway between social media use and poor mental health. Screen-free bedtime hours were recommended as the single most impactful intervention, directly informing the present study's focus on nighttime social media use as a key predictor variable.

Review 4: Social Media Addiction and Psychosocial Health in Karnataka Adolescents (2024)

Conducted among 80 school students aged 15–18 in Karnataka using cluster sampling, this study found significant associations between social media addiction and psychosocial health parameters using chi-square and Mann-Whitney U tests. Questionnaires were administered in English, Kannada, and Hindi. Students using social media for more than 3 hours daily reported significantly higher anxiety and loneliness. This Karnataka-specific study provides direct local contextual validation for the present investigation and confirms the feasibility of multi-language data collection in rural Karnataka adolescent research.

Review 5: Impact of Social Media on Adolescent Mental Health-Karnataka Perspective (2024)

This article outlined four key mechanisms through which social media adversely affects adolescent mental health: (1) Social comparison-exposure to curated content creating feelings of inadequacy; (2) Fear of Missing Out (FOMO)-generating anxiety about peer activities; (3) Dopamine-driven addiction-infinite-scroll and notification architectures creating compulsive use in still-developing brains; and (4) Cyberbullying-amplifying mental health burden among rural adolescents with fewer social support networks. The Karnataka provenance of this article directly supports the cultural validity of the present study's findings and recommendations.

Review 6: Social Media Use, Mental Health and Sleep-Systematic Review with Meta-analyses (2024)

This meta-analysis confirmed strong positive associations between social media use, poor sleep, and adverse mental health outcomes globally. Problematic social media use was associated with depression (OR 2.1), anxiety (OR 2.4), and sleep disorder (OR 2.8). Sleep disruption emerged as a key mediating variable: adolescents with poor sleep had significantly higher depression and anxiety rates, forming a reinforcing

cycle-social media disrupts sleep, and poor sleep worsens mental health vulnerability. This directly supports the PSQI–GHQ-12 correlation analysis conducted in the present study.

OBJECTIVES

1. To assess the socio-demographic profile and pattern of social media use among rural adolescents in Dharwad district, Karnataka.
2. To assess sleep quality (PSQI) and identify the prevalence of poor sleep quality.
3. To assess mental health status (GHQ-12) and identify probable psychiatric caseness.
4. To determine the correlation between daily social media usage duration and PSQI scores.
5. To determine the correlation between daily social media usage duration and GHQ-12 scores.
6. To determine the correlation between PSQI and GHQ-12 scores.
7. To examine the association between selected socio-demographic variables, social media patterns, sleep quality, and mental health.

DESCRIPTION OF TOOLS

The study employed a structured socio-demographic proforma and three validated psychometric instruments. All tools were back-translated into Kannada by bilingual experts and pilot-tested on 10 adolescents. Content validity was established by a panel of 5 subject experts (3 nursing faculty, 1 psychiatrist, 1 clinical psychologist).

Tool I: Structured Socio-demographic and Social Media Use Proforma

Type: Investigator-developed structured proforma (19 items)

Section A-Socio-demographic data (12 items): Age, gender, class, type of school, family type, monthly income, parental education, parental occupation, number of siblings.

Section B-Social media use profile (7 items): Device owned, daily usage duration (hours), primary platform, purpose of use, time of use (daytime/nighttime), bedroom use, parental monitoring.

Tool II: Bergen Social Media Addiction Scale (BSMAS)

Items: 6 items rated on a 5-point Likert scale (1=Very Rarely to 5=Very Often); Total score: 6–30

Cut-off: Score ≥19 = At-Risk for Social Media Addiction

Domains: Salience, Tolerance, Mood Modification, Relapse, Withdrawal, Conflict

Reliability: Cronbach alpha = 0.88 (original); 0.83–0.87 across adaptation studies

Validity: Validated across 27 countries; widely used in Indian adolescent research.

Item	Component	Question (1=Very Rarely → 5=Very Often)
1	Salience	Spent a lot of time thinking about social media or planning use?
2	Tolerance	Felt an urge to use social media more and more?
3	Mood Modification	Used social media to forget about personal problems?
4	Relapse	Tried to cut down on use of social media without success?
5	Withdrawal	Become restless if you have been prohibited from using social media?
6	Conflict	Used social media so much that it negatively impacted your studies?

Scoring: Sum of all 6 items (range 6–30). Score ≥19 = At-Risk.

Tool III: Pittsburgh Sleep Quality Index (PSQI)

Items: 19 self-rated items forming 7 component scores (0–3 each); Global PSQI: 0–21

Cut-off: Global PSQI >5 = Poor Sleep Quality

Reliability: Cronbach alpha = 0.83; Test-retest reliability r = 0.87

Validity: Sensitivity 89.6%, Specificity 86.5%; validated in Indian populations (Kannada version available)

Code	Component	Score Range	Description
C1	Subjective Sleep Quality	0–3	Self-rating of overall sleep quality
C2	Sleep Latency	0–3	Time to fall asleep; combines self-rating with ≥30 min latency frequency
C3	Sleep Duration	0–3	>7 hrs=0; 6–7 hrs=1; 5–6 hrs=2; <5 hrs=3
C4	Habitual Sleep Efficiency	0–3	(Sleep hours ÷ Time in bed) × 100; ≥85%=0
C5	Sleep Disturbances	0–3	Frequency of 9 sleep problem indicators
C6	Sleep Medication	0–3	Frequency of sleep medication use in past month
C7	Daytime Dysfunction	0–3	Daytime sleepiness + enthusiasm problems

Global PSQI = Sum of 7 component scores. Score ≤5 = Good Sleep Quality; >5 = Poor Sleep Quality.

Tool IV: General Health Questionnaire-12 (GHQ-12)

Items: 12 items assessing general psychological distress

Scoring: Bimodal (0-0-1-1); total 0–12

Cut-off: Score ≥4 = Probable Psychiatric Case

Reliability: Cronbach alpha = 0.82–0.88 across Indian studies

Validity: Sensitivity 76.9%, Specificity 84.2% against DSM criteria; validated in Indian adolescent research

Item	Domain	Question
1	Concentration	Have you recently been able to concentrate on whatever you are doing?
2	Sleep Loss	Have you recently lost much sleep over worry?
3	Usefulness	Have you recently felt that you are playing a useful part in things?
4	Decision	Have you recently felt capable of making decisions about things?
5	Strain	Have you recently felt constantly under strain?
6	Difficulty	Have you recently felt that you could not overcome your difficulties?
7	Enjoyment	Have you recently been able to enjoy your normal day-to-day activities?
8	Problems	Have you recently been able to face up to your problems?
9	Unhappiness	Have you recently been feeling unhappy and depressed?
10	Confidence	Have you recently been losing confidence in yourself?
11	Worthlessness	Have you recently been thinking of yourself as a worthless person?
12	Happiness	Have you recently been feeling reasonably happy, all things considered?

Scoring: "Better/Same as usual" = 0; "Less/Much less than usual" = 1. Total 0–12. Cut-off ≥4 = Probable Psychiatric Case.

6. METHODOLOGY

Research Design: Descriptive correlational cross-sectional study.

Setting: Selected rural villages (Kalaghatagi, Annigeri, and Navalagund taluks) and government schools, Dharwad district, Karnataka.

Duration: 6 weeks: January – February 2025.

Sample Size: N = 50 (n = Z^2pq/d^2 at 95% CI, p=0.65; minimum n=44; 12% buffer = 50).

Sampling Technique: Non-probability purposive sampling.

Inclusion Criteria: Adolescents aged 13–19 years in rural Dharwad; regular smartphone/device access for ≥3 months; active social media user; written assent + parental consent.

Exclusion Criteria: Diagnosed psychiatric disorders under treatment; known sleep disorders; chronic illness affecting sleep; refusal to participate.

Statistical Analysis: IBM SPSS v25. Descriptive: frequency, percentage, mean, SD. Inferential: Pearson correlation, independent t-test, chi-square. Significance: $p<0.05$ (two-tailed); Cohen's d for effect size.

Table A: Sampling Frame and Sample Tool

Parameter	Details
Research Design	Descriptive correlational cross-sectional study
Study Population	Adolescents aged 13–19 years residing in rural villages of Dharwad district, Karnataka
Sample Size	N = 50 (formula: n = Z^2pq/d^2 at 95% CI, p=0.65; minimum n=44; 12% buffer = 50)
Sampling Frame	Student rolls of government high schools + community youth registers in Kalaghatagi, Annigeri, and Navalagund taluks, Dharwad district
Sampling Technique	Non-probability purposive sampling
Sampling Unit	Individual adolescent aged 13–19 years with at least 3 months of regular social media use
Inclusion Criteria	• Aged 13–19 years in rural Dharwad • Regular smartphone access for ≥3 months • Active user of ≥1 social media platform • Written assent (minor) + parental consent
Exclusion Criteria	• Diagnosed psychiatric disorder under active treatment • Known sleep disorder • Chronic physical illness affecting sleep • Refusal to participate
Data Collection	Self-administered bilingual (Kannada–English) questionnaire; supervised group administration at school
Data Collection Period	6 weeks: January – February 2025
Drop-out / Attrition	Nil — all 50 participants completed all questionnaires
Ethical Clearance	Approved — Institutional Ethics Committee, TIONS, Hubballi (Ref: TIONS/IEC/2025/01); Parental consent + adolescent assent obtained

7. RESULTS

Section I: Socio-demographic Profile and Social Media Usage Patterns

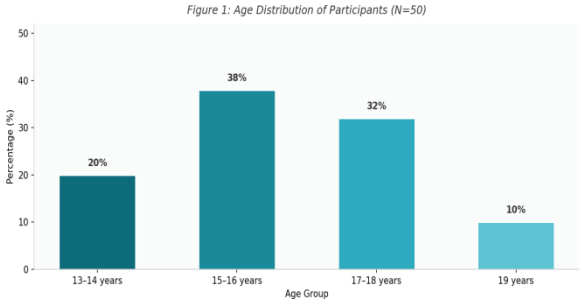

Figure 1: Age Distribution of Participants (N=50)

Figure 2: Gender Distribution of Participants (N=50)

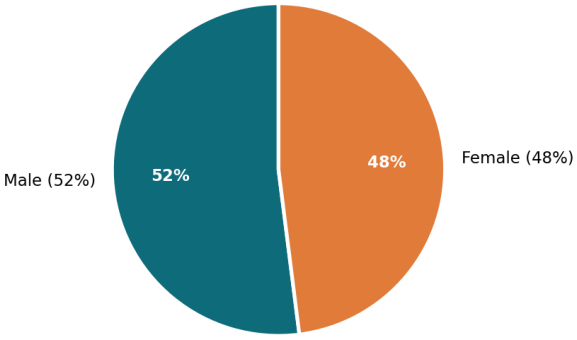

Figure 2: Gender Distribution of Participants (N=50)

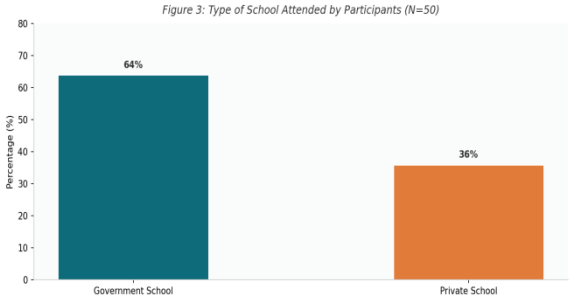

Figure 3: Type of School Attended (N=50)

Figure 4: Monthly Family Income Distribution (N=50)

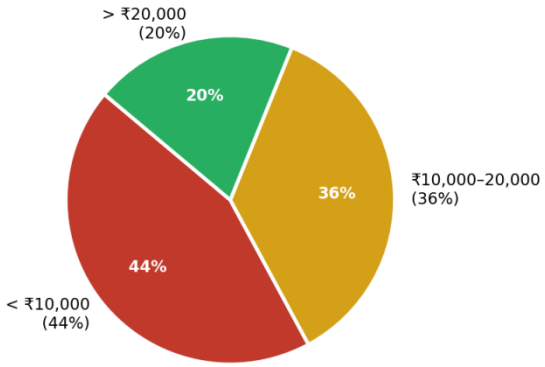

Figure 4: Monthly Family Income Distribution (N=50)

Table 1: Socio-demographic Profile of Participants (N=50)

Variable	Category	n	%
Age Group	13–14 years	10	20.0%
	15–16 years	19	38.0%
	17–18 years	16	32.0%
	19 years	5	10.0%
Gender	Male	26	52.0%
	Female	24	48.0%
School Type	Government	32	64.0%
	Private	18	36.0%
Class	8th–9th Std	15	30.0%
	10th Std	14	28.0%
	11th–12th Std	21	42.0%
Monthly Income	< ₹10,000	22	44.0%
	₹10,000–20,000	18	36.0%
	> ₹20,000	10	20.0%
Family Type	Nuclear	27	54.0%
	Joint	23	46.0%
Parental Education	Below SSLC	19	38.0%
	SSLC / PUC	21	42.0%
	Graduate+	10	20.0%

The majority (38%) were aged 15–16 years. Gender distribution was near-equal (52% male, 48% female). Government school students constituted 64%. Monthly family income was low in 44% of households (< ₹10,000), with 38% of parents having below-SSLC education-limiting parental digital literacy and supervision.

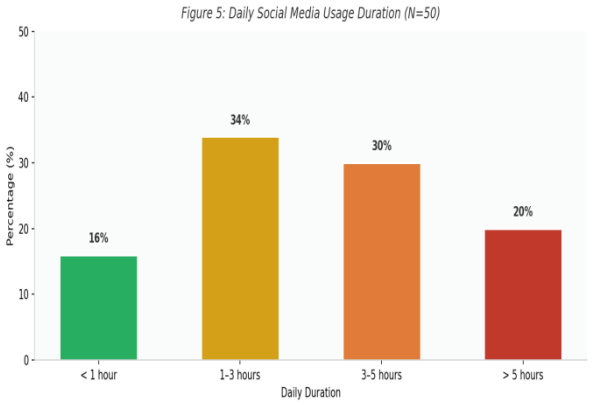

Figure 5: Daily Social Media Usage Duration (N=50)

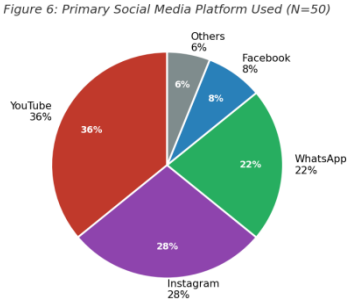

Figure 6: Primary Social Media Platform Used (N=50)

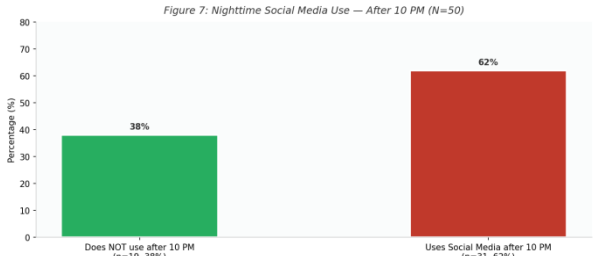

Figure 7: Nighttime Social Media Use — After 10 PM (N=50)

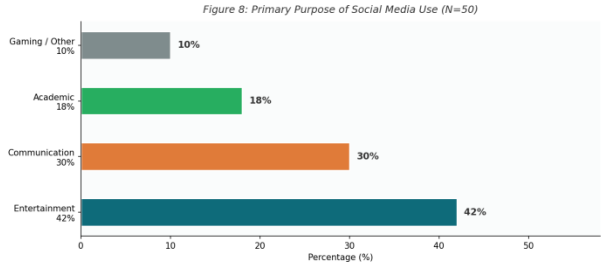

Figure 8: Primary Purpose of Social Media Use (N=50)

Table 2: Social Media Usage Patterns (N=50)

Variable	Category	n	%
Daily SM Duration	< 1 hour	8	16.0%
	1–3 hours	17	34.0%
	3–5 hours	15	30.0%
	> 5 hours	10	20.0%
Primary Platform	YouTube	18	36.0%
	Instagram	14	28.0%
	WhatsApp	11	22.0%
	Facebook	4	8.0%
	Others	3	6.0%
Purpose	Entertainment	21	42.0%
	Communication	15	30.0%
	Academic	9	18.0%
	Gaming/Other	5	10.0%
Night Use (>10 PM)	Yes	31	62.0%
	No	19	38.0%

SM = Social Media. 62% used social media after 10 PM-the key risk factor for sleep disruption identified in this study.

50% of participants used social media for more than 3 hours daily. YouTube was the most used platform (36%), followed by Instagram (28%) and WhatsApp (22%). 62% reported using social media after 10 PM, and entertainment was the primary purpose (42%).

Section II: Social Media Addiction Risk — BSMAS Results

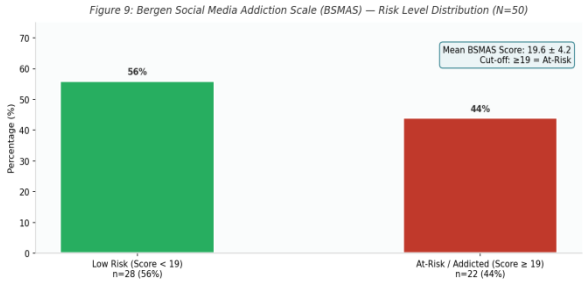

Figure 9: BSMAS Risk Level Distribution (N=50) — Low Risk (56%) vs At-Risk (44%)

BSMAS Component	Mean Score (1–5)	SD	Observation
Salience	3.6	0.82	High — preoccupation with social media
Tolerance	3.2	0.91	Moderate — escalating usage pattern
Mood Modification	3.4	0.78	High — escapism through social media
Relapse	2.8	1.02	Moderate — difficulty cutting down
Withdrawal	3.8	0.74	Highest — distress when access denied
Conflict	2.8	0.94	Moderate — negative academic impact
Total BSMAS Score	19.6	4.2	Borderline At-Risk (cut-off ≥19)

Table 3: BSMAS component scores (N=50). 44% (n=22) met the at-risk criterion (score ≥19).

Mean BSMAS score 19.6 ± 4.2; 44% at-risk. Withdrawal scored highest (3.8 ± 0.74), reflecting restlessness when social media access is denied. Salience (3.6) and Mood Modification (3.4) were also elevated, indicating preoccupation and emotional dependence on social media.

Section III: Sleep Quality-PSQI Results

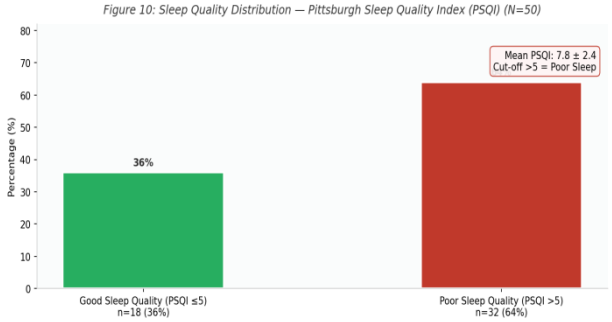

Figure 10: Sleep Quality Distribution — PSQI (N=50): 64% Poor Sleep (PSQI >5)

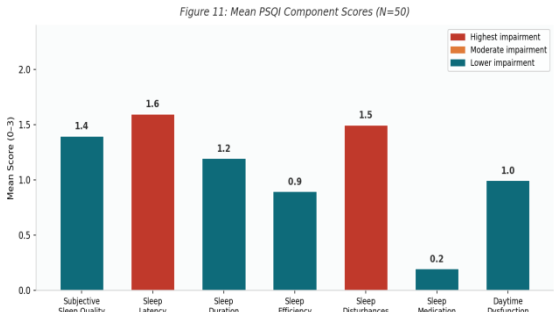

Figure 11: Mean PSQI Component Scores (N=50)

Sleep Variable	n	%	Mean ± SD	Range
Good Sleep Quality (PSQI ≤5)	18	36.0%	3.8 ± 1.1	1–5
Poor Sleep Quality (PSQI >5)	32	64.0%	9.6 ± 2.1	6–18
Overall Sample	50	100%	7.8 ± 2.4	1–18
Night Use Group (PSQI)	31	62.0%	9.4 ± 2.0	5–18
No Night Use Group (PSQI)	19	38.0%	5.2 ± 1.4	1–8

Table 4: PSQI results. Independent t-test (Night vs No-Night PSQI): t=4.82, df=48, p<0.001; Cohen's d = 1.41 (large effect).

64% of rural adolescents had poor sleep quality (PSQI >5; mean 7.8 ± 2.4). Sleep Latency (mean 1.6) and Sleep Disturbances (mean 1.5) were the most impaired PSQI components. Adolescents using social media after 10 PM had markedly higher PSQI (9.4 vs 5.2, Cohen's d=1.41-large effect, p<0.001).

Section IV: Mental Health Assessment-GHQ-12 Results

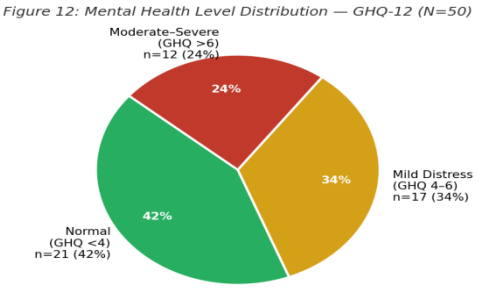

Figure 12: GHQ-12 Mental Health Distribution — 58% Probable Psychiatric Caseness (N=50)

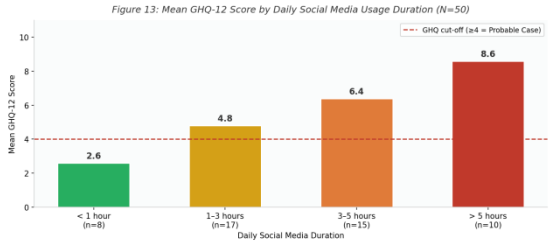

Figure 13: Mean GHQ-12 Score by Daily Social Media Usage Duration (N=50)

GHQ-12 Category	Score	n	%	Mean GHQ ± SD
Normal (No Distress)	<4	21	42.0%	2.2 ± 0.9
Mild Psychological Distress	4–6	17	34.0%	5.1 ± 0.6
Moderate–Severe Distress	>6	12	24.0%	8.4 ± 1.4
Total Sample	0–12	50	100%	5.6 ± 2.8
Probable Psychiatric Cases (GHQ ≥4)	≥4	29	58.0%	6.4 ± 2.1

Table 5: GHQ-12 distribution. Cut-off ≥4 (bimodal) = Probable Psychiatric Caseness.

58% met the GHQ-12 caseness threshold (≥4). Mean GHQ-12 increased from 2.6 (< 1 hr/day) to 8.6 (> 5 hrs/day), demonstrating a clear dose-response relationship. Female adolescents had slightly higher scores (6.1 vs 5.2 in males).

Section V: Correlation and Statistical Analysis

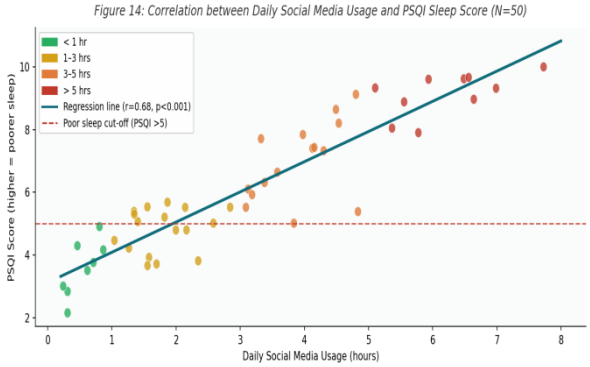

Figure 14: Scatter Plot — Daily Social Media Usage vs PSQI Score (r=0.68, p<0.001)

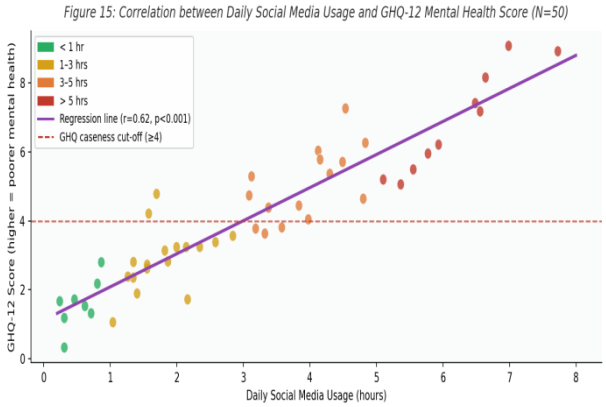

Figure 15: Scatter Plot — Daily Social Media Usage vs GHQ-12 Score (r=0.62, p<0.001)

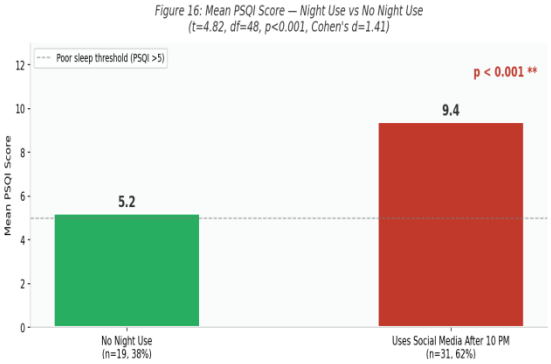

Figure 16: Mean PSQI Score-Night Use vs No Night Use (t=4.82, p<0.001)

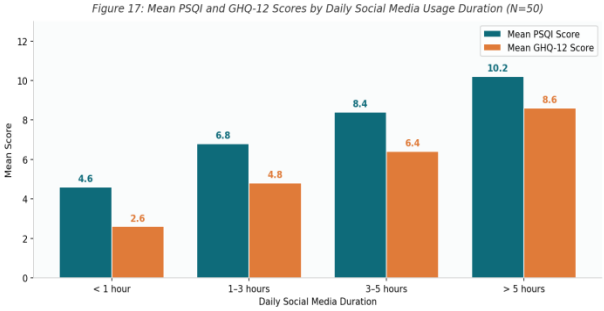

Figure 17: Mean PSQI and GHQ-12 Scores by Daily Social Media Duration (N=50)

Correlation Pair	Pearson r	r^2	p-value	Strength
SM daily hours vs PSQI Score	0.68	0.46	< 0.001**	Strong Positive
SM daily hours vs GHQ-12 Score	0.62	0.38	< 0.001**	Moderate–Strong
PSQI Score vs GHQ-12 Score	0.74	0.55	< 0.001**	Strong Positive
BSMAS Total vs GHQ-12 Score	0.71	0.50	< 0.001**	Strong Positive
BSMAS Total vs PSQI Score	0.67	0.45	< 0.001**	Moderate–Strong
Night Use (hrs) vs PSQI Score	0.70	0.49	< 0.001**	Strong Positive
Age of adolescent vs PSQI	0.18	0.03	0.207 NS	Weak (Not Sig.)
Family income vs GHQ-12	-0.32	0.10	0.024*	Weak Negative

Table 6: Pearson correlation matrix. ** p<0.001; * p<0.05; NS = Not Significant. Strength: r<0.3=Weak; 0.3–0.59=Moderate; ≥0.6=Strong.

Socio-demographic Variable	χ^2 (PSQI >5)	χ^2 (GHQ ≥4)	df	p (PSQI)	p (GHQ)	Inference
Gender	4.82	5.14	1	0.028*	0.023*	Both S*
Age group	7.24	6.88	3	0.065 NS	0.076 NS	Both NS
Class / Grade	9.16	8.42	2	0.010*	0.015*	Both S*
School type	5.38	4.96	1	0.020*	0.026*	Both S*
Monthly income	3.24	7.86	2	0.072 NS	0.020*	GHQ S* only
Family type	6.42	5.68	1	0.011*	0.017*	Both S*
Parental education	8.94	10.22	2	0.011*	0.006**	Both S**
Daily SM hours	16.84	14.62	3	0.001**	0.002**	Both S**
Night use after 10 PM	12.46	10.88	1	<0.001**	0.001**	Both S**
Primary platform	9.62	8.84	4	0.047*	0.065 NS	PSQI S*
Device ownership	4.14	3.82	2	0.126 NS	0.148 NS	Both NS
Purpose of SM use	11.24	9.68	3	0.010*	0.022*	Both S*

Table 7: Chi-square results. S** p<0.01; S* p<0.05; NS = Not Significant.

DISCUSSION

The findings provide compelling evidence of a significant, dose-dependent relationship between social media use and both sleep quality and mental health outcomes among rural adolescents in Karnataka. The prevalence of poor sleep quality (64%) and probable psychiatric caseness (58%) surpasses many urban Indian and international estimates, suggesting that rural adolescents constitute a particularly vulnerable subgroup.

The mean BSMAS score of 19.6 ± 4.2, with 44% at-risk, is substantially higher than earlier urban estimates. This reflects the combined effect of reduced parental digital literacy (38% below SSLC), limited alternative recreational infrastructure, and near-ubiquitous affordable smartphone access without digital hygiene education.

The correlation between social media hours and PSQI (r=0.68, p<0.001) is consistent with global systematic review findings. The most striking finding is the dramatic PSQI difference between night-use adolescents (mean 9.4) and non-night-use adolescents (mean 5.2), with a large effect size (Cohen's d=1.41), operating through blue-light-mediated melatonin

suppression and psychological arousal from social content. The PSQI–GHQ-12 correlation ($r=0.74$, $p<0.001$) identifies sleep quality as a key mediating variable in the social media–mental health pathway: social media disrupts sleep → poor sleep worsens emotional regulation → adolescents use social media to cope → further sleep disruption. Female adolescents showed higher GHQ-12 scores (6.1 vs 5.2), consistent with greater vulnerability to social comparison-driven anxiety. Parental education was significantly protective ($\chi^2=10.22$, $p=0.006$).

CONCLUSION

This study of 50 rural adolescents in Dharwad district, Karnataka, demonstrates that social media use-particularly heavy and nocturnal use-is strongly associated with poor sleep quality and compromised mental health. The prevalence of poor sleep quality (64%) and probable psychiatric caseness (58%) are higher than many urban Indian estimates, reflecting the heightened vulnerability of rural youth with rapidly increasing digital access but inadequate digital literacy infrastructure. The dose-response relationship between daily social media hours and PSQI/GHQ-12, combined with the large effect of nighttime use (Cohen's $d=1.41$), provides a strong empirical basis for targeted public health action.

RECOMMENDATIONS AND NURSING IMPLICATIONS

1. School-based digital hygiene programme: Nurse-led sessions in government schools covering healthy social media habits, screen-free bedtime routines, recognising addiction signs, and mental health first aid.
2. Screen-free bedtime policy: School health nurses should advocate for family pledges establishing a screen-free period of ≥1 hour before bedtime.
3. Parental digital literacy workshops: Community health nurses should deliver structured awareness sessions for parents on responsible supervision of adolescent smartphone use.
4. GHQ-12 screening at adolescent clinics: Integrate GHQ-12 into routine adolescent health check-ups at PHCs and CHCs; refer GHQ ≥4 cases for counselling.
5. Further research: Longitudinal studies needed to establish temporal directionality and evaluate effectiveness of school-based digital hygiene interventions.

LIMITATIONS

Cross-sectional design precludes causal inference. Small sample (N=50) limits generalisability. Self-reported usage hours subject to recall and social desirability bias. Objective sleep measurement (actigraphy) was not feasible. Future studies should use larger probability samples and objective sleep instruments.

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CONFLICT OF INTEREST

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INFORMED CONSENT

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AUTHOR CONTRIBUTIONS

Both are contributed equally.

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