

Impact Of Screen Time and Sleep Quality on Perceived Stress Among Postgraduate and Doctoral Students: A Cross-Sectional Study

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Abstract—Background: Postgraduate (PG) and doctoral students rely heavily on digital devices for academic work, raising concern that screen use may be driving elevated student stress, potentially through its effect on sleep. This study examined whether screen time and sleep quality independently predict perceived stress among PG and doctoral scholars. **Materials and Methods:** A cross-sectional survey was conducted among 152 PG and PhD students selected through convenience sampling at a state university. Data were collected using a structured questionnaire comprising the Perceived Stress Scale (PSS-10) and a Pittsburgh Sleep Quality Index (PSQI)-based instrument. Data were analysed in SPSS using descriptive statistics, Pearson correlation, and multiple linear regression. **Results:** Screen time was not significantly associated with perceived stress ($r = 0.003$, $P = 0.969$) or sleep quality ($r = -0.032$, $P = 0.693$). Sleep quality showed a significant positive correlation with perceived stress ($r = 0.319$, $P < 0.001$). Multiple regression confirmed sleep quality as a significant predictor of stress ($\beta = 0.319$, $P < 0.001$), while screen time was not ($\beta = 0.013$, $P = 0.863$); the model explained 10.2% of variance in stress ($R^2 = 0.102$, $F = 8.432$, $P < 0.001$). **Conclusion:** Among postgraduate and doctoral students, perceived stress is significantly predicted by sleep quality but not by screen time. Interventions aimed at reducing student stress may be more effective if directed at improving sleep quality rather than restricting screen use, which is often academically necessary for this population.

Index Terms—perceived stress; postgraduate students; screen time; sleep quality; students

I. INTRODUCTION

Digital devices have become central to how people work, study, and relax, prompting concern about their effects on sleep and mental health.¹ Sleep supports

memory consolidation and physiological recovery but is frequently disrupted by late-night device use.² Blue light exposure from screens suppresses melatonin release and delays sleep onset,³ and emerging evidence suggests a chain reaction in which disrupted digital habits reduce sleep quality, which in turn lowers an individual's capacity to cope with everyday demands.⁴

For postgraduate (PG) and doctoral students, this dynamic is compounded by heavy academic reliance on digital devices for research and communication.⁵ These students often face a "digital dilemma" in which screen use required for academic work extends into late-night hours, delaying sleep onset via time displacement^{6,7} and circadian disruption from blue light exposure.⁸ Because reducing screen time is not a realistic option for scholars whose work depends on digital devices, it is important to establish whether screen time itself drives stress or whether its effect, if any, operates indirectly through sleep quality.

Perceived stress is an individual's subjective appraisal of how unpredictable, uncontrollable, and overwhelming their circumstances feel.⁹ It is commonly measured using the Perceived Stress Scale (PSS-10),¹⁰ grounded in the Transactional Model of Stress and Coping, under which stress arises when perceived environmental demands exceed available coping resources.¹¹ Sleep quality denotes overall satisfaction with one's sleep experience — ease of falling asleep, continuity, duration, and daytime restoration¹² — and is best captured through subjective instruments such as the Pittsburgh Sleep Quality Index (PSQI), since objective sleep duration does not always correspond to perceived restfulness.^{13,14}

Prior research linking screen use to sleep and psychological distress is extensive but inconsistent regarding perceived stress specifically. Several studies report that bedtime screen use is associated with poorer sleep quality and reduced sleep duration.¹⁵¹⁶ Associations between screen time and broader mental-health outcomes have also been reported among secondary and university students.¹⁷¹⁸¹⁹²⁰ However, studies examining perceived stress specifically have found screen time to be a poor predictor: Rajasekaran et al. found that problematic screen use predicted anxiety but not stress,²¹ and Johannes et al., using objective device-logged data, likewise found no significant association between smartphone use and perceived stress.²² By contrast, several studies report that poor sleep quality is directly and consistently associated with elevated stress among students.²³²⁴²⁵²⁶²⁷

Despite this literature, few studies focus specifically on PG and doctoral scholars, whose screen use is driven mainly by academic necessity rather than leisure,⁵ and few jointly model screen time and sleep quality as independent predictors of perceived stress in a single analysis. This study addresses that gap by examining, among PG and doctoral students, (i) the relationship between screen time and perceived stress, and (ii) the relationship between sleep quality and perceived stress.

II. MATERIALS AND METHODS

Study Design and Setting

This was a cross-sectional, questionnaire-based study conducted among postgraduate (PG) and doctoral (PhD) students at a state university in Himachal Pradesh, India, over a four-week data collection period.

Study Population and Sampling

The study population comprised PG and PhD students, selected because their academic work requires sustained digital device use that frequently extends into personal and rest time. A convenience sample of 152 valid responses was obtained. The demographic profile of the sample is presented in Table 1.

Data Collection Instrument

Data were collected using a self-administered, 37-item structured questionnaire comprising four sections: (a)

demographic characteristics; (b) an 8-item screen time and digital habits section rated on a 4-point scale; (c) the 10-item Perceived Stress Scale (PSS-10),¹⁰ rated on a 5-point scale (1 = Never to 5 = Very often); and (d) a 12-item sleep quality section adapted from the Pittsburgh Sleep Quality Index (PSQI),¹⁴ rated on a 4-point frequency scale. The questionnaire was administered through Google Forms and printed copies.

Ethical Considerations

This study was conducted as part of a postgraduate academic project under the supervision of Dr. Vikrant Jaswal, Department of Management Studies, Sardar Patel University, Mandi, and was reviewed and approved at the departmental level prior to data collection.

As the survey involved anonymous, voluntary participation by adult students on non-sensitive, minimal-risk topics, and did not involve any clinical intervention, biological samples, or vulnerable populations, it did not require review by a formal Institutional Ethics Committee (IEC) under the university's applicable research policy at the time of the study. Participation was voluntary, informed consent was obtained from all respondents prior to survey administration, and responses were collected anonymously, with confidentiality of participant data maintained throughout, in accordance with the ethical principles of the Declaration of Helsinki. [Author: confirm this statement with your department/university research office before submission, and replace with a formal IEC/IRB approval number if one is subsequently obtained or required by the target journal.]

Statistical Analysis

Data were coded and cleaned in Microsoft Excel, including reverse-coding of positively worded PSS-10 items, and analysed using IBM SPSS Statistics. Internal consistency of the PSS-10 was assessed using Cronbach's alpha. Associations between screen time, sleep quality, and perceived stress were examined using Pearson correlation. Multiple linear regression was used to test the independent predictive contribution of screen time and sleep quality (PSQI) to perceived stress (PSS).

A P value < 0.05 was considered statistically significant.

Results

Of the 152 respondents, 84.21% were aged 18–25 years and 84.21% were enrolled in a PG programme (15.79% PhD). The sample was 58.55% female, 74.34% rural, and 89.47% reported the smartphone as their primary device (Table 1).

Table 1: Demographic Profile of The Sample (N = 152)

Variable	Category	n	%
Age	18-25 years	128	84.21
	Above 25 years	24	15.79
Gender	Male	63	41.45
	Female	89	58.55
Programme	PG	128	84.21
	PhD	24	15.79
Family income	< ₹1 lakh/annum	71	46.71
	₹1-3 lakh/annum	42	27.63
	> ₹3 lakh/annum	39	25.66
Residence	Rural	113	74.34
	Urban	39	25.66
Primary device	Smartphone	136	89.47
	Laptop/PC	10	6.58
	Tablet	5	3.29
	TV	1	0.66

Mean screen time was 2.50 (SD 0.79) on a 4-point scale, mean perceived stress was 2.78 (SD 0.30) on a 5-point scale, and mean sleep quality (PSQI) was 1.91 (SD 0.41) on a 4-point scale, indicating moderate-to-high screen use, moderate and fairly uniform stress, and mild-to-moderate sleep disturbance across the sample (Table 2). The PSS-10 demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.722$).

Table 2: Descriptive statistics of study variables

Variable	Mean	SD	N
Screen Time	2.50	0.79	152
Sleep Quality (PSQI)	1.91	0.41	152
Perceived Stress (PSS)	2.78	0.30	152

Screen time was not significantly correlated with perceived stress ($r = 0.003$, $P = 0.969$) or sleep quality ($r = -0.032$, $P = 0.693$). Sleep quality showed a significant, moderate positive correlation with perceived stress ($r = 0.319$, $P < 0.001$) (Table 3).

Table 3: Pearson correlation matrix of study variables

	Screen Time	PSQI	PSS
Screen Time	—		
PSQI	-0.032 ($P = 0.693$)	—	
PSS	0.003 ($P = 0.969$)	0.319** ($P < 0.001$)	—

**Correlation is significant at the 0.01 level (2-tailed).

A multiple linear regression with screen time and sleep quality as predictors of perceived stress was statistically significant, $F(2,149) = 8.432$, $P < 0.001$, $R^2 = 0.102$ (Table 4).

Screen time was not a significant independent predictor ($\beta = 0.013$, $P = 0.863$), whereas sleep quality was a significant positive predictor ($\beta = 0.319$, $P < 0.001$): a one-point deterioration in PSQI score was associated with a 0.232-point increase in perceived stress (Table 5).

Table 4: ANOVA summary for the regression model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.375	2	0.687	8.432	< 0.001
Residual	12.145	149	0.082		
Total	13.520	151			

Table 5: Regression coefficients for predicting perceived stress

Predictor	B	SE	β	t	Sig.
Constant	2.319	0.135	—	17.241	< 0.001
Screen Time	0.005	0.029	0.013	0.173	0.863
Sleep Quality (PSQI)	0.232	0.057	0.319	4.016	< 0.001

Table 6: Hypothesis testing summary

Hypothesis	Relationship Tested	β	Sig.	Decision
H1	Screen Time $\rightarrow$ Perceived Stress	0.013	0.863	Not supported
H2	Sleep Quality $\rightarrow$ Perceived Stress	0.319	< 0.001	Supported

III. DISCUSSION

This study found that screen time was not significantly associated with perceived stress or sleep quality among PG and doctoral students, whereas sleep quality was a significant, independent predictor of perceived stress. This pattern is consistent with Rajasekaran et al. and Johannes et al., who similarly found no significant association between screen time and perceived stress, even using objective usage data.²¹²² It suggests that for populations whose screen use is predominantly academic rather than recreational, duration of use alone is a poor proxy for psychological distress.

The significant sleep quality–stress association is consistent with prior work among Indian and international student samples.²³²⁵²⁴²⁶ This is compatible with the Transactional Model of Stress and Coping,¹¹ under which poor sleep depletes the cognitive and emotional resources available for coping with academic demands, making the same workload feel more threatening. The modest effect size ($R^2 = 0.102$) indicates that screen time and sleep quality are real but partial contributors to student stress, with most of the variance attributable to factors such as academic workload, financial pressure, and personal circumstances that fall outside this model.

These findings have practical implications: since PG and PhD students cannot realistically reduce screen use given its academic necessity, interventions aimed at improving sleep quality directly — such as blue-light management, sleep-hygiene counselling, and structured wind-down routines — are likely to be more effective than blanket screen-time-reduction policies.²⁸

IV. LIMITATIONS

This study used a convenience sample of 152 students from a single university, limiting generalisability. All measures were self-reported, introducing potential recall and social-desirability bias. The cross-sectional design precludes causal inference. The regression model explained only 10.2% of variance in perceived stress, indicating that most contributors to student stress remain unmeasured. Future studies should use longitudinal designs, objective screen-time and sleep-tracking tools, and larger multi-institutional samples,

and should distinguish academic from leisure screen use.

V. CONCLUSION

Among postgraduate and doctoral students, perceived stress was significantly predicted by sleep quality but not by screen time. These findings suggest that universities seeking to reduce student stress should prioritise interventions that protect and improve sleep quality over strategies aimed at reducing screen use, which is often unavoidable for this population.

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Conflicts of Interest
There are no conflicts of interest.

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