
Doomscrolling, Digital Burnout, and Sleep Disturbance Among University Students in Pakistan: The Statistical Mediating Role of Digital Burnout

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Abstract

Doomscrolling the repetitive consumption of negative online information has been associated with psychological distress, yet the processes linking this behaviour with sleep problems remain insufficiently studied in Pakistani university populations. This cross sectional quantitative study examined the associations among doomscrolling, digital burnout, and sleep disturbance and tested whether digital burnout statistically accounted for part of the doomscrolling sleep relationship. The cleaned sample comprised 300 university students aged 18-29 years; Pittsburgh Sleep Quality Index (PSQI) scores were derivable for 283 participants. Doomscrolling was measured using the 11 items available from the exported Doomscrolling Questionnaire, digital burnout using 23 available items from the Digital Burnout Scale, and sleep disturbance using the PSQI. Doomscrolling correlated strongly with digital burnout, $r = .710$, $p < .001$, and positively with sleep disturbance, $r = .606$, $p < .001$. Digital burnout also correlated with sleep disturbance, $r = .580$, $p < .001$. A bootstrap mediation model showed a significant indirect association through digital burnout, $ab = .033$, 95% BCa CI [.016, .051], while the direct effect remained significant. Poor sleep quality (PSQI > 5) was observed in 65.7% of participants with scoreable PSQI data. The findings support digital burnout as a plausible, nonexclusive statistical pathway connecting doomscrolling with poorer sleep, while the cross sectional design precludes causal inference.

Keywords: doomscrolling, digital burnout, sleep disturbance, university students, mediation, Pakistan

Introduction

University students now integrate academic tasks, social communication, leisure, and news consumption into overlapping digital spaces. Although this convergence is beneficial, it also exposes students to emotionally charged or threatening content while they study or rest. Consequently, the psychological impact of digital media is shaped not only by time spent online but also by content type, perceived control over use, and timing of exposure. Prior reviews on social media and sleep indicate that problematic or highly engaged digital use tends to correlate with poorer sleep in young people; however, most evidence is cross-sectional and cannot establish causality (Alonzo et al., 2021; Carter et al., 2016; Levenson et al., 2016).

Doomscrolling—persistent or compulsive consumption of negative online news and social media content—has attracted growing attention. Rather than merely measuring screen time, this construct captures emotional valence, repeated checking, difficulty disengaging, and the belief that continued scrolling may reduce uncertainty. Empirical studies have linked doomscrolling with psychological distress, problematic social media use, lower well-being, existential anxiety, and pessimistic beliefs (Satici et al., 2023; Shabahang et al., 2023, 2024; Sharma et al., 2022). A scoping review similarly reported consistent associations with anxiety, depression, stress, and reduced resilience, while noting conceptual inconsistency, self-report bias, and reliance on cross-sectional designs (Sharpe et al., 2026).

University settings are particularly relevant because students remain digitally connected for lectures, research, messaging, employment, entertainment, and news. As a result, the line between required digital participation and compulsive consumption can become blurred. In Pakistan, studies have linked problematic digital use with insomnia or poor sleep among university students (Kaleem et al., 2023; Khan et al., 2024; Rizvi et al., 2024). Notably, Umber et al. (2025) found that overall or nighttime social media use was not significantly related to sleep quality, whereas emotional engagement was associated with sleep disturbance. This suggests that content-specific and strain-related factors may be more informative than general screen exposure.

Digital burnout may serve as one explanatory mechanism. It reflects cognitive and emotional wear resulting from sustained digital engagement and comprises digital aging, digital deprivation, and emotional exhaustion (Erten & Özdemir, 2020). Cross-cultural validation has supported the reliability and construct validity of the Digital Burnout Scale in university-age populations (Choi & Kim, 2024). Digital burnout also overlaps with technostress, especially when constant connectivity, information overload, and intrusions into personal time continuously tax attentional and emotional resources (Ayyagari et al., 2011; Tarafdar et al., 2007). For students who repeatedly consume distressing information, negative affect, prolonged attention, checking behaviour, and difficulty disengaging may contribute to digital exhaustion.

Sleep disturbance is another critical outcome because university students often face irregular schedules, delayed bedtimes, daytime sleepiness, and competing academic or social demands (Hershner & Chervin, 2014; Lund et al., 2010). Digital use near bedtime may affect sleep through multiple pathways. Scrolling can displace sleep time, while emotionally threatening

content may heighten worry, mental imagery, vigilance, and cognitive arousal. The cognitive model of insomnia suggests that worry and heightened pre-sleep monitoring maintain wakefulness and impair sleep initiation and continuity (Harvey, 2002). Recent evidence also shows that the timing and type of screen activity matter; bedtime device use and pre-bed screen exposure have been linked with shorter sleep or later sleep timing, although objective and self-reported measures do not always converge (Chkhaidze et al., 2025; Hjetland et al., 2025; Zhong et al., 2025).

Direct evidence linking doomscrolling with sleep is emerging. Camadan and Uzunoğlu (2026) found that doomscrolling was associated with poorer sleep quality, with FoMO and nomophobia contributing to the indirect pathway. In Pakistan, Usman et al. (2025) reported that doomscrolling among media students was associated with anxiety, emotional exhaustion, digital fatigue, and poor sleep. Hussain et al. (2025) also found positive associations among multiscreen addiction, doomscrolling, and digital burnout in young adults. These findings suggest that burnout-related strain may be one of several processes connecting repetitive negative content consumption with sleep problems.

Literature Review

Theoretical Basis

Several theoretical frameworks inform the proposed model. Uses and Gratifications Theory proposes that individuals actively select media to satisfy needs such as information, reassurance, entertainment, or social connection (Ruggiero, 2000). Under uncertainty, repeated news checking may begin as purposeful information seeking but become habitual when closure is not achieved. Compensatory Internet Use Theory similarly suggests that online activity may be used to regulate negative mood or stress; short-term relief can reinforce continued use despite longer-term costs (Kardefelt-Winther, 2014). These perspectives are relevant because doomscrolling may be sustained by a cycle in which uncertainty triggers checking, checking exposes users to more negative content, and that exposure maintains uncertainty or distress.

Conservation of Resources theory provides a complementary explanation for digital burnout. Individuals strive to protect resources such as time, attention, emotional energy, and recovery opportunities. Repeated resource expenditure without replenishment can produce strain (Hobfoll, 1989). In this context, doomscrolling may deplete attentional resources, increase emotional load, and extend device use into periods otherwise reserved for rest. Technostress research similarly identifies overload, invasion of personal time, complexity, and constant connectivity as sources of strain (Ayyagari et al., 2011; Tarafdar et al., 2007). Digital burnout can thus be conceptualized as a subjective strain state that may co-occur with and statistically link negative digital engagement to poorer sleep.

Sleep models further explain why a direct relationship may persist after accounting for burnout. Doomscrolling can delay bedtime, expose users to stimulating content, and sustain threat-focused cognition after device use ends. These pathways align with cognitive arousal accounts of insomnia and broader evidence linking screen use with sleep disturbance (Harvey, 2002; Hartstein et al., 2024). Therefore, digital burnout is unlikely to be the sole mechanism. A model

in which burnout explains part—but not all—of the doomscrolling–sleep association is theoretically plausible.

Research Gap and Study Objectives

Despite growing research, three gaps remain. First, much evidence on student digital behaviour focuses on total screen time, smartphone addiction, or general social media use rather than doomscrolling as a distinct pattern of negative content consumption. Second, digital burnout has rarely been examined as a statistical intermediary between doomscrolling and multidimensional sleep disturbance. Third, Pakistani evidence remains limited and concentrated in specific cities, disciplines, or measures. Local findings suggest that emotional engagement and digital strain may matter, but an integrated model of doomscrolling, digital burnout, and sleep disturbance remains underdeveloped (Hussain et al., 2025; Umber et al., 2025; Usman et al., 2025).

Accordingly, this study addressed four questions: (a) whether doomscrolling was associated with digital burnout; (b) whether doomscrolling was associated with sleep disturbance; (c) whether digital burnout was associated with sleep disturbance; and (d) whether digital burnout statistically accounted for part of the association between doomscrolling and sleep disturbance. It was hypothesized that all three bivariate associations would be positive and that the bootstrap indirect effect through digital burnout would differ from zero. Because the design was cross-sectional, the mediation model was interpreted as a decomposition of contemporaneous associations rather than evidence of temporal or causal mediation (Hayes, 2022).

Research Methodology

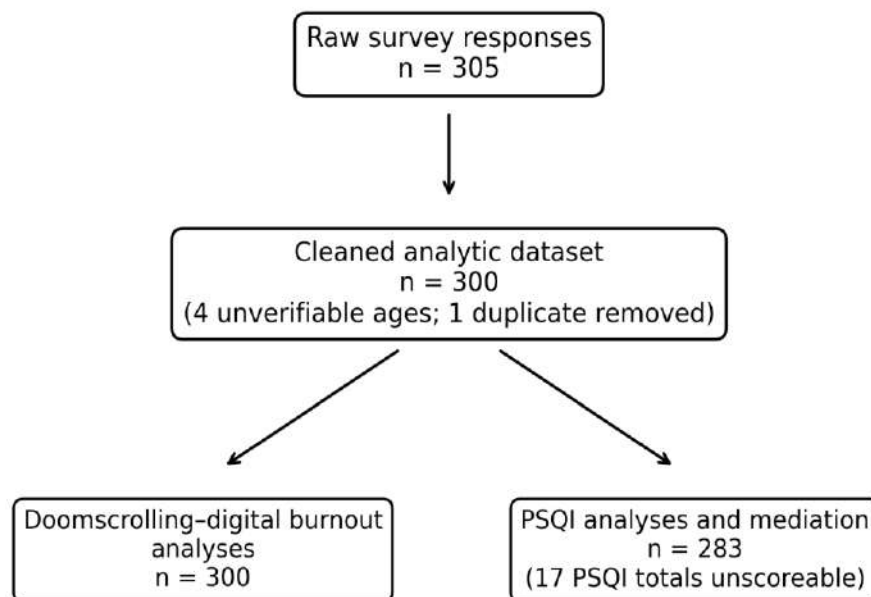
Research Design and Participants

This study employed a post-positivist, quantitative, non-experimental, cross-sectional correlational design. Participants were university students in Pakistan aged 18 years or older. Responses were obtained through convenience access to university students and online distribution. The raw response workbook contained 305 submitted rows. Five records were removed during cleaning: four because age entries were nonnumeric and eligibility could not be established, and one because it was an exact duplicate of an earlier response. The final cleaned dataset therefore contained 300 unique cases. Fourteen retained cases had structurally missing demographic fields but complete scale responses and were retained for relevant scale analyses.

Age data were available for 286 participants and ranged from 18 to 29 years. All 300 retained cases had usable doomscrolling and digital burnout scores. Derivation of the seven PSQI components required valid sleep time and symptom inputs; 17 cases could not be assigned a PSQI global score. Consequently, analyses involving sleep disturbance, including mediation, used 283 complete cases. Figure 1 summarizes the analytic flow.

Figure 1

Analytic Sample Flow



Fourteen cases had missing demographic blocks but complete study-scale responses and were retained for scale analyses.

Note. The raw workbook contained 305 response rows. The cleaned scale dataset contained 300 unique cases, and 283 had a derivable PSQI global score.

Measures

Doomscrolling was assessed using the items available from the Doomscrolling Questionnaire (DQ 12; Melnyk & Stadnik, 2024). Responses range from 0 (never) to 4 (always) and the questionnaire applies published item weights. The survey export contained items 1 3 and 5 12; item 4 was absent. The missing item was not imputed or prorated. Analyses therefore used the observed weighted score from 11 collected items, with a theoretical observed form range of 0 92. Published severity categories for the complete DQ 12 were not applied.

Digital burnout was assessed using the Digital Burnout Scale developed by Erten and Özdemir (2020), which includes dimensions of digital aging, digital deprivation, and emotional exhaustion. Items are rated from 1 (strongly disagree) to 5 (entirely agree). The survey export contained 23 of the 24 published items because item 12 was absent. The missing item was not imputed. The observed form total therefore ranged theoretically from 23 to 115 and comprised 11 digital aging items, 6 digital deprivation items, and 6 emotional exhaustion items. Higher scores represented greater digital burnout. The scale has shown strong reliability in prior cross cultural validation research (Choi & Kim, 2024).

Sleep disturbance was measured using the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989). The PSQI yields seven component scores subjective sleep quality, sleep

latency, sleep duration, habitual sleep efficiency, sleep disturbances, sleep medication use, and daytime dysfunction each scored from 0 to 3. The global score ranges from 0 to 21, with higher values indicating poorer sleep. A global score above 5 was used as the conventional screening threshold for poor sleep quality. If a required component could not be derived from the participant's responses, the global score was treated as missing.

Procedure, Data Preparation, and Ethical Considerations

The questionnaire was administered electronically. Identifying fields were excluded from the analytic variables, and records were anonymized before analysis. An unused all zero platform score was removed. Text responses were coded into numeric categories, reported bed and wake times were converted into analyzable time values, and PSQI component scores were derived from the relevant sleep time and symptom frequency responses. No high or low study score was removed merely because it was extreme.

Participation information, voluntary consent, confidentiality, and the right to stop before submission were presented within the questionnaire. The analytic dataset used for the thesis did not include personal identifiers, and results were reported in aggregate. The source thesis available for this article does not contain a completed institutional ethics committee name or approval/reference number. Those formal approval details must be inserted in the manuscript before journal submission so that the ethical statement accurately reflects the institution's record.

Statistical Analysis

Data were summarized using frequencies, percentages, means, standard deviations, medians, observed ranges, skewness, kurtosis, and distributional plots. Internal consistency was evaluated using Cronbach's alpha with bootstrap confidence intervals and corrected item total correlations. The three bivariate hypotheses were tested using two tailed Pearson correlations, with Fisher transformed 95% confidence intervals used to describe precision (Field, 2018).

For the fourth hypothesis, an ordinary least squares mediation analysis equivalent to PROCESS Model 4 was estimated with doomscrolling as X, digital burnout as M, and PSQI global score as Y. The a path represented the association of doomscrolling with digital burnout; the b path represented the association of digital burnout with sleep disturbance while controlling doomscrolling; c represented the total doomscrolling sleep association; and c' represented the direct association after including digital burnout. The indirect effect, ab, was evaluated with 5,000 bootstrap resamples and a 95% bias corrected and accelerated (BCa) confidence interval. An interval not containing zero was interpreted as statistical support for an indirect association (Hayes, 2022). Regression diagnostics included residual inspection, Breusch Pagan tests, Durbin Watson statistics, variance inflation factors, normality checks, Cook's distance, and HC3 robust standard error sensitivity analyses. Statistical tests were two tailed with $\alpha = .05$.

Results / Findings

Participant Characteristics

Among the 286 participants with demographic data, mean age was 24.87 years (SD = 2.42; range 18 29). Men constituted 55.9% of the valid demographic sample and women 44.1%. Most participants reported a joint family system (71.3%), urban residence (89.2%), and current employment (65.0%). Postgraduate students represented 55.9% of the valid demographic sample. These characteristics describe the convenience sample and should not be interpreted as population estimates for Pakistani university students.

Table 1

Demographic Characteristics of Participants

Characteristic	Category / statistic	n	% of valid
Age	M = 24.87, SD = 2.42; range 18 29	286	
Gender	Male	160	55.9
	Female	126	44.1
Family system	Joint	204	71.3
	Nuclear	82	28.7
Degree	BA/BS	126	44.1
	MA/MS	160	55.9
Residence	Urban	255	89.2
	Rural	31	10.8
Employment	Employed	186	65.0
	Unemployed	100	35.0

Note. Valid demographic n = 286; 14 retained cases had structurally missing demographic data. Percentages are based on valid demographic responses.

Reliability and Descriptive Statistics

The observed 11 item doomscrolling set showed good internal consistency, $\alpha = .896$, 95% bootstrap CI [.877, .911], with corrected item total correlations from .488 to .711. The observed 23 item Digital Burnout Scale showed excellent internal consistency, $\alpha = .944$, 95% CI [.935, .952], with item total correlations from .485 to .707. Internal consistency across the seven PSQI components was lower, $\alpha = .661$, 95% CI [.603, .709], which is understandable for a multidimensional index but warrants caution when treating the global score as a homogeneous scale.

Mean doomscrolling was 36.36 (SD = 22.63) and mean digital burnout was 64.72 (SD = 18.64). Among 283 participants with a scoreable PSQI, the mean global score was 7.67 (SD = 3.55), above the conventional screening threshold of 5. Distributional indices showed small absolute skewness values and no univariate pattern severe enough to justify deleting observations solely on the basis of their scores.

Table 2

Reliability and Descriptive Statistics for Study Measures

Measure	n	M (SD)	Observed range	Cronbach's α (95% CI)
Doomscrolling weighted score	300	36.36 (22.63)	3 83	.896 [.877, .911]
Digital burnout total	300	64.72 (18.64)	26 105	.944 [.935, .952]
PSQI global score	283	7.67 (3.55)	1 16	.661 [.603, .709]
Digital aging	300	30.15 (9.33)	11 50	
Digital deprivation	300	17.33 (5.69)	6 29	
Emotional exhaustion	300	17.24 (5.11)	6 28	

Note. DQ and Digital Burnout Scale values are based on the observed incomplete forms in the exported dataset. PSQI = Pittsburgh Sleep Quality Index.

Bivariate Associations

All three hypothesized bivariate associations were statistically significant. Doomscrolling was strongly associated with digital burnout, $r(298) = .710$, 95% CI [.649, .762], $p < .001$. Doomscrolling was also positively associated with sleep disturbance, $r(281) = .606$, 95% CI [.527, .675], $p < .001$, indicating that higher doomscrolling scores co occurred with poorer sleep. Digital burnout was positively associated with sleep disturbance, $r(281) = .580$, 95% CI [.497, .652], $p < .001$. The corresponding shared variance estimates were approximately 50.4%, 36.7%, and 33.6%, respectively. Figure 2 visualizes the correlation pattern.

Table 3

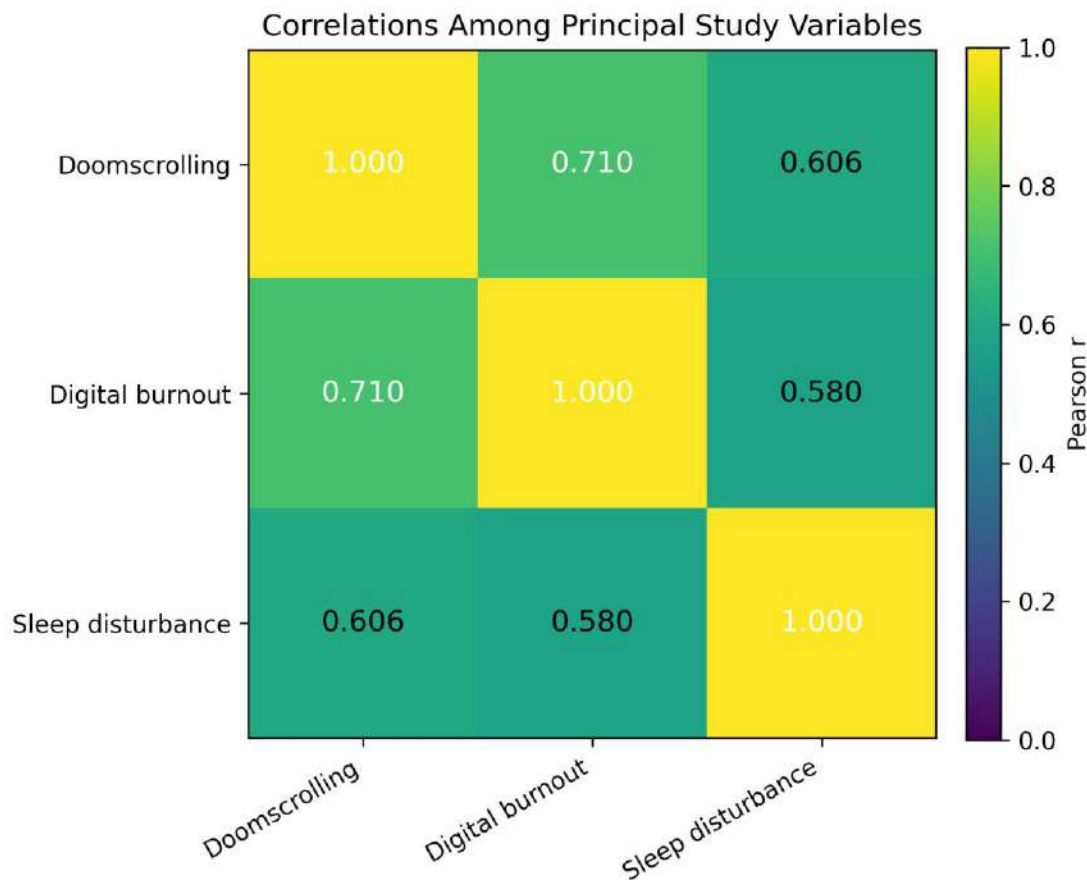
Pearson Correlations Among Principal Study Variables

Association	n	r	95% CI	p
Doomscrolling digital burnout	300	.710	[.649, .762]	< .001
Doomscrolling PSQI	283	.606	[.527, .675]	< .001
Digital burnout PSQI	283	.580	[.497, .652]	< .001

Note. Higher PSQI scores indicate poorer sleep.

Figure 2

Correlations Among Principal Study Variables



Note. Values are Pearson correlations. Sleep disturbance is represented by the PSQI global score, where higher values indicate poorer sleep.

Mediation Model

In the mediator equation, doomsscrolling significantly predicted digital burnout, $a = .591$, $SE = .033$, $t(281) = 18.11$, $p < .001$, 95% CI [.527, .655], $\beta = .734$. This model accounted for 53.8% of the variance in digital burnout, $R^2 = .538$, $F(1, 281) = 327.85$, $p < .001$. In the total effect model, doomsscrolling significantly predicted PSQI score, $c = .094$, $SE = .007$, $t(281) = 12.77$, $p < .001$, 95% CI [.079, .108], $\beta = .606$.

When digital burnout was included in the outcome model, burnout remained associated with sleep disturbance, $b = .056$, $SE = .013$, $t(280) = 4.32$, $p < .001$, 95% CI [.031, .082], $\beta = .293$. The direct doomsscrolling effect also remained significant, $c' = .060$, $SE = .010$, $t(280) = 5.77$, $p < .001$, 95% CI [.040, .081], $\beta = .391$. The final outcome model accounted for 40.7% of the variance in PSQI scores, $R^2 = .407$, adjusted $R^2 = .403$, $F(2, 280) = 96.00$, $p < .001$.

The bootstrapped indirect effect through digital burnout was $ab = .033$ (Boot SE = .009), with a 95% BCa confidence interval [.016, .051]. Because the interval excluded zero, the indirect association was statistically supported. The completely standardized indirect effect was .215 and the indirect effect represented approximately 35.5% of the total estimated association. Because the direct effect remained significant and the variables were measured at the same time point, the finding is best described as a partial statistical indirect effect rather than

evidence that digital burnout temporally or causally mediates the effect of doomscrolling on sleep.

Table 4

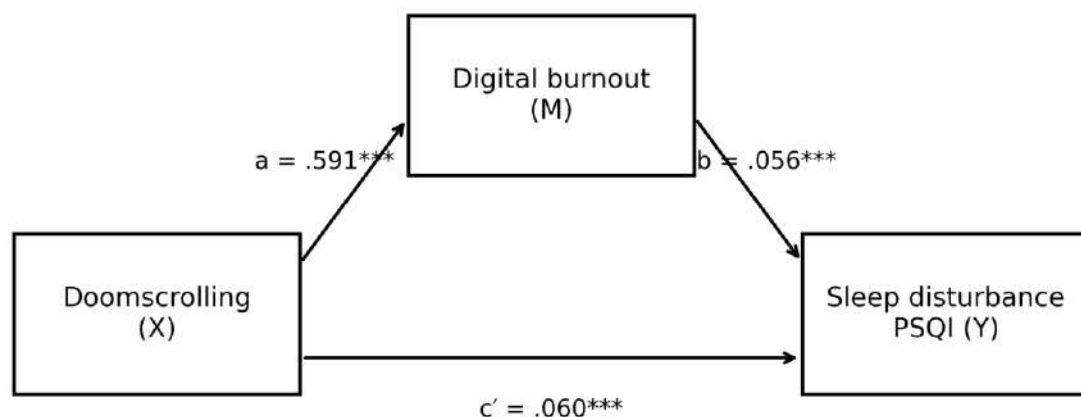
Regression and Bootstrap Estimates for the Statistical Mediation Model

Path / effect	B	SE	95% CI	p / bootstrap result
a: Doomscrolling → digital burnout	.591	.033	[.527, .655]	p < .001
c: Doomscrolling → PSQI (total)	.094	.007	[.079, .108]	p < .001
b: Digital burnout → PSQI doomscrolling	.056	.013	[.031, .082]	p < .001
c': Doomscrolling → PSQI burnout	.060	.010	[.040, .081]	p < .001
ab: Indirect effect	.033	.009	BCa [.016, .051]	CI excludes 0

Note. n = 283. Coefficients are unstandardised. The indirect effect used 5,000 bootstrap resamples.

Figure 3

Statistical Mediation Model Linking Doomscrolling, Digital Burnout, and Sleep Disturbance



Total effect c = .094*** | Indirect effect ab = .033, 95% BCa CI [.016, .051]

***p < .001. Unstandardised coefficients; n = 283.

Note. The figure shows unstandardised coefficients. The indirect effect was .033, 95% BCa CI [.016, .051]. The cross sectional model does not establish temporal or causal mediation.

Regression Diagnostics and Sleep Profile

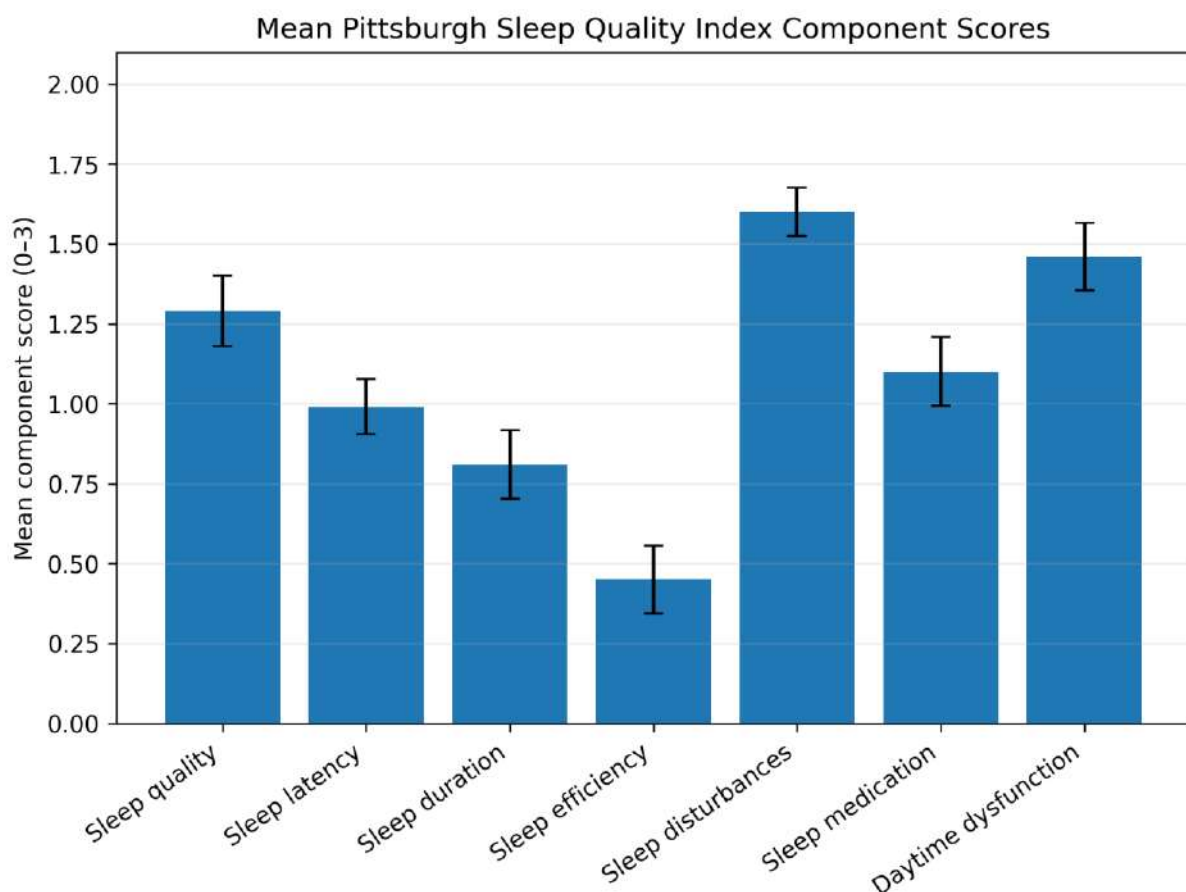
Regression diagnostics did not indicate serious model instability. The variance inflation factor in the final outcome model was 2.17, Durbin Watson values were 1.65 and 1.80 across the reported equations, and Breusch Pagan tests were nonsignificant. Shapiro Wilk tests were statistically significant, but graphical inspection indicated only modest deviations from

normality in this sample size. Cook's distances were approximately .01 or lower. The substantive conclusions were unchanged when HC3 robust standard errors were used.

The PSQI profile suggested that sleep difficulties were distributed across several domains rather than concentrated in a single symptom. The largest mean component was sleep disturbances (M = 1.60, SD = 0.67), followed by daytime dysfunction (M = 1.46, SD = 0.93), subjective sleep quality (M = 1.29, SD = 0.98), and sleep medication use (M = 1.10, SD = 0.95). Among the 283 participants with scoreable global PSQI data, 186 (65.7%) were classified as poor sleepers using the conventional criterion of PSQI > 5, while 97 (34.3%) scored 5 or below. This is a screening classification rather than a clinical diagnosis.

Figure 4

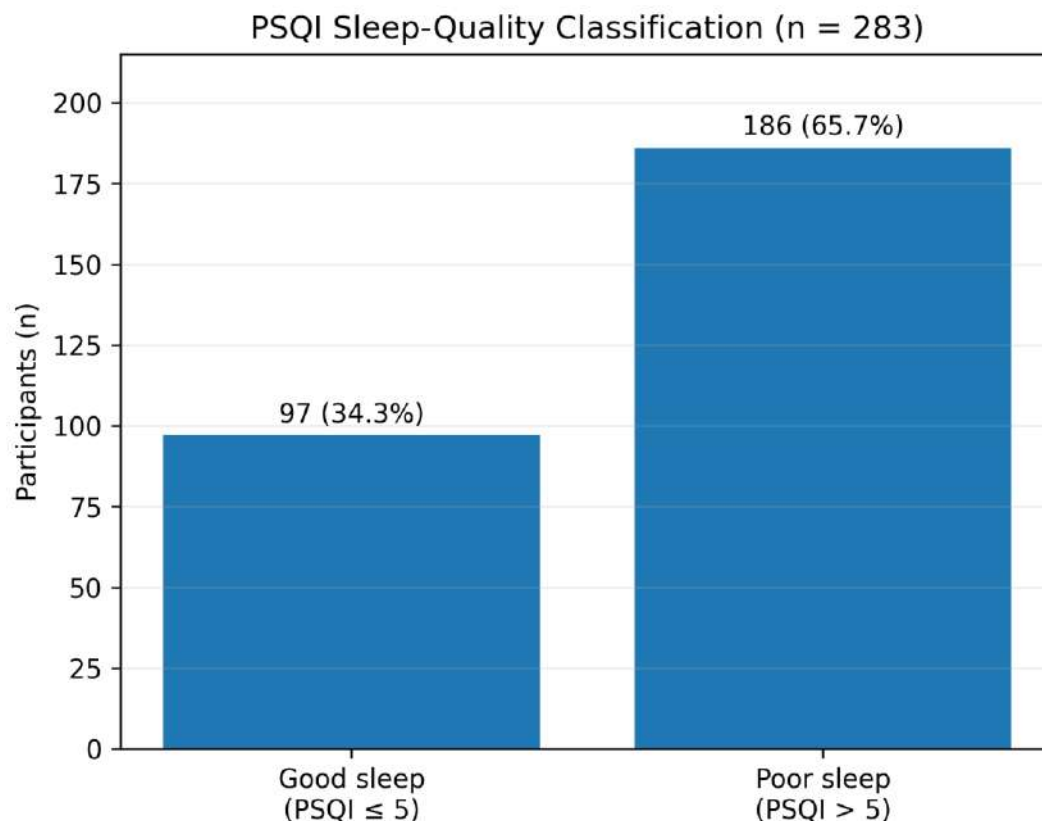
Mean Pittsburgh Sleep Quality Index Component Scores



Note. Error bars represent approximate 95% confidence intervals around component means. Each component ranges from 0 to 3, with higher values indicating greater difficulty.

Figure 5

PSQI Sleep Quality Classification



Note. Poor sleep quality was defined by the conventional screening criterion of PSQI > 5. Classification was available for n = 283 participants.

Discussion

The study examined whether doomscrolling, digital burnout, and sleep disturbance were interrelated among Pakistani university students and whether digital burnout statistically accounted for part of the doomscrolling sleep association. All four hypotheses were supported. Doomscrolling showed a strong positive association with digital burnout and a moderately strong positive association with sleep disturbance. Digital burnout was also positively associated with sleep disturbance. The bootstrap analysis identified a significant indirect association through digital burnout, while a substantial direct doomscrolling sleep association remained. The overall pattern therefore supports digital burnout as one plausible, non-exclusive pathway within a broader network of digital strain and sleep disruption.

The strongest bivariate association was between doomscrolling and digital burnout. This finding is consistent with the idea that repeated engagement with negative information may consume attentional and emotional resources and make digital activity feel increasingly draining. It also corresponds with local evidence linking doomscrolling with digital fatigue or burnout among young adults and media students (Hussain et al., 2025; Usman et al., 2025). From a Conservation of Resources perspective, recurrent checking can be understood as repeated expenditure of attention, time, and emotional energy without adequate recovery (Hobfoll, 1989). From a technostress perspective, persistent connectivity and information

overload can generate strain even when the digital activity is not formal work (Ayyagari et al., 2011; Tarafdar et al., 2007).

At the same time, the magnitude of the doomscrolling burnout correlation requires careful interpretation because the constructs are conceptually adjacent. Doomscrolling items capture difficulty disengaging, nighttime checking, uncertainty, and strain, while the Digital Burnout Scale includes cognitive wear, disconnection discomfort, and emotional exhaustion. The strong internal consistency of the observed burnout items supports their use as a composite in this dataset, but future research should examine discriminant validity and the measurement structure of both constructs in Pakistani student samples. Confirmatory factor analysis and measurement invariance testing would help determine whether the two measures remain sufficiently distinct across demographic groups and languages.

The positive relationship between doomscrolling and sleep disturbance is consistent with a growing body of research linking problematic social media or smartphone engagement with poor sleep (Alonzo et al., 2021; Carter et al., 2016; Levenson et al., 2016). More specifically, the result parallels evidence that doomscrolling itself is associated with poor sleep quality (Camadan & Uzunoğlu, 2026). The present study extends that pattern to a Pakistani university sample while using the PSQI as a multidimensional sleep measure. The sleep profile is important: approximately two thirds of participants with scoreable PSQI data exceeded the conventional threshold for poor sleep, and the largest component scores were sleep disturbances and daytime dysfunction. Thus, the association was observed in a sample in which sleep difficulties were common enough to provide meaningful variation.

Several mechanisms could explain the doomscrolling sleep association without assuming a single causal pathway. First, prolonged scrolling can delay bedtime and shorten the opportunity for sleep. Second, negative content can increase cognitive and emotional arousal, leaving users with threat focused thoughts or mental imagery after the device is put away. This interpretation is consistent with Harvey's (2002) cognitive model of insomnia. Third, poor sleepers may be more likely to reach for their phones when unable to sleep, creating a reciprocal pattern in which sleep difficulty increases exposure to negative content. Recent theoretical work emphasizes that the relationship between technology use and sleep can be bidirectional and shaped by who is using the technology, when it is used, and what activity is occurring (Bauducco et al., 2024).

The digital burnout sleep association also aligns with research on social media fatigue, problematic smartphone use, and digital stress. Zhu et al. (2023) reported interrelationships among social media addiction, fatigue, FoMO, and sleep quality in university students. The current findings are compatible with that broader literature, but they use a dedicated digital burnout construct. Digital aging may reflect cognitive or physical wear that makes it harder to disengage; digital deprivation may encourage keeping devices close and checking them at night; and emotional exhaustion may weaken the self-regulation needed to maintain consistent bedtime routines. These possibilities remain theoretical in the present cross sectional dataset, but they help explain why digital burnout retained an independent association with PSQI after doomscrolling was included.

The indirect effect analysis provides the most distinctive contribution. Approximately one third of the total estimated doomscrolling sleep association was represented by the product of the doomscrolling burnout and burnout sleep paths. This supports the study's proposed statistical model while also showing that burnout does not account for the entire association. The remaining direct effect is consistent with alternative mechanisms such as time displacement, pre sleep arousal, FoMO, nomophobia, or pre existing distress. Camadan and Uzunoğlu (2026), for example, identified FoMO and nomophobia as explanatory variables in the relationship between doomscrolling and poor sleep. The present results suggest that digital burnout may be another relevant construct rather than a replacement for those pathways.

The findings also help interpret mixed Pakistani evidence on general social media use and sleep. Some local research has found significant relationships between smartphone or social networking addiction and poor sleep (Kaleem et al., 2023; Khan et al., 2024; Rizvi et al., 2024), while Umber et al. (2025) reported that emotional engagement, rather than overall or nighttime social media use alone, was related to sleep disturbance. The current content specific and strain focused results fit that distinction. They suggest that the psychological quality of digital engagement particularly exposure to negative content and the experience of depletion may provide information that is not captured by a simple total screen time measure.

Recent research further supports the importance of timing and measurement. Chkhaidze et al. (2025) found that bedtime device use among young adults with poor sleep was associated with shorter self-reported sleep, although the pattern did not fully reproduce in Fitbit derived measures. Hjetland et al. (2025) reported that different screen activities and timing were differentially related to sleep in university students, and Zhong et al. (2025) identified associations between pre bed screen use and sleep duration or timing in a very large adult sample. Together, these studies reinforce two points relevant to the present findings: self-report associations are meaningful for perceived wellbeing, but objective digital use and sleep measures are needed to determine how strongly the observed relationships correspond to recorded behaviour.

Practically, the findings argue against treating all digital use as uniformly harmful. Universities depend heavily on digital platforms for learning and communication, and students also use them for social support and information. Interventions may therefore be more useful when they focus on patterns of engagement rather than blanket screen reduction. Psychoeducation could help students distinguish purposeful information seeking from repetitive negative content checking, recognize signs of digital burnout, reduce unnecessary notifications, and establish a protected period before bedtime without distressing feeds. Sleep education can also emphasize regular wake times, reduced in bed device use, and strategies to lower pre sleep cognitive arousal. These approaches are consistent with broader recommendations on screen use and sleep health (Hartstein et al., 2024).

Counselling services should also avoid assuming that doomscrolling is merely a bad habit. Repetitive negative content consumption may coexist with anxiety, depressive symptoms, trauma related distress, FoMO, or nomophobia. When students report persistent nighttime checking or difficulty disengaging, assessment of these broader concerns may be

appropriate. The present study did not measure those variables, so they should be treated as possible confounders or alternative pathways rather than explanations established by the current data.

Strengths and Limitations

Several strengths improve the interpretability of the study. The research questions, hypotheses, and statistical tests were aligned; sample attrition and missingness were reported; effect sizes and confidence intervals were emphasized; and the indirect effect was evaluated with bootstrap inference rather than relying only on the significance of individual paths. Regression diagnostics and HC3 sensitivity checks also suggested that the principal findings were not driven by obvious violations of ordinary least squares assumptions.

The limitations are substantial and should shape interpretation. Most importantly, the cross sectional design does not establish temporal order. Statistical mediation in one-time data cannot demonstrate that doomscrolling occurred before burnout or that burnout occurred before sleep disturbance. Reverse or reciprocal pathways remain plausible. Second, all principal variables were self-reported, creating common method bias and making the estimates vulnerable to shared response tendencies. Third, the convenience sample was not nationally representative; it contained high proportions of urban, employed, joint family, and postgraduate respondents. Generalization beyond the sampled students therefore requires replication.

A further measurement limitation is that the response export did not contain one item from the DQ 12 and one item from the 24 item Digital Burnout Scale. The study appropriately did not impute or prorate these missing instrument items, but the observed form totals are not fully comparable with published complete form scores or severity bands. The PSQI also showed only moderate internal consistency across its seven heterogeneous components. Finally, variables such as chronotype, academic workload, baseline mental health symptoms, medication use, socioeconomic status, trauma exposure, platform type, and objectively recorded screen time were not incorporated. Any of these factors could contribute to both digital behaviour and sleep.

Conclusion and Recommendations

This study provides evidence that doomscrolling, digital burnout, and sleep disturbance co-occur meaningfully among university students in the sampled Pakistani context. Doomscrolling was strongly associated with digital burnout and positively associated with poorer sleep, while digital burnout was independently associated with sleep disturbance. The bootstrap model further showed a statistically significant indirect association through digital burnout, alongside a remaining direct doomscrolling sleep association. These findings support a model in which digital exhaustion may be one pathway linking repetitive negative content engagement with poorer sleep, but they do not establish causality.

Universities should consider integrating digital wellbeing content into student mental health and sleep programs. Useful topics include recognising doomscrolling, limiting unnecessary notifications, creating boundaries around late night news consumption, and developing a consistent wind down routine. Institutional communication practices can also

reduce pressure for constant availability by setting clearer expectations for response times outside normal academic hours.

Future studies should use longitudinal, multiwave, or experimental designs to test temporal direction and reciprocal effects. Complete validated versions of the doomscrolling and digital burnout measures should be administered, with Urdu and English versions evaluated psychometrically where appropriate. Multisite sampling across public and private universities, provinces, academic disciplines, and rural/urban settings would improve generalizability. Combining self-report with passive device logs, sleep diaries, or actigraphy would help distinguish content specific exposure from overall screen time. Future models should also consider chronotype, FoMO, nomophobia, workload, trauma exposure, and baseline mental health symptoms as potential confounders, mediators, or moderators.

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