Sleep Characteristics and Academic Performance among Faculty of Education Students at Uitm Puncak Alam

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ABSTRACT

Sleep characteristics may be associated with academic achievement, but their interpretation depends on the measures, scoring procedures and statistical tests used. This study described sleep characteristics and examined their association with academic performance among Faculty of Education students at Universiti Teknologi MARA, Puncak Alam. A quantitative cross-sectional questionnaire survey included 331 students. The instrument contained demographic questions, sleep questions based on the Pittsburgh Sleep Quality Index and a self-reported grade point average item. Available analyses comprised frequency distributions, descriptive statistics and a Pearson correlation. There were 166 male participants (50.2%) and 165 female participants (49.8%). Subjective sleep quality was rated fairly good by 134 participants (40.5%) and fairly bad by 99 (29.9%). The most frequently reported sleep-duration category was 6–7 hours (126 participants; 38.1%), followed by 5–6 hours (113; 34.1%). The reported sleep-quality variable had a mean of 2.41 (standard deviation 0.915), and the academic-performance variable had a mean of 1.7069 (standard deviation 0.481). The association was positive and small ($r = .102$, $n = 331$, $p = .032$, two-tailed). These findings describe variation in students' sleep experiences and a small association between the recorded variables. This study did not establish that better sleep improves grades or that sleep predicts achievement independently of other factors.

Keywords: sleep quality, academic performance, university students, cross-sectional study, Malaysia

INTRODUCTION

Sleep is relevant to learning, yet associations observed in educational settings depend on how both sleep and achievement are measured. In a semester-long study using wearable activity trackers, Okano et al. [1] linked sleep duration, quality and consistency with performance in a college chemistry course. Sleep over the learning period was more informative than sleep on the single night before an assessment. Creswell et al. [2] extended this approach across universities, relating early-term actigraphy to subsequent grade point average (GPA) while accounting for previous achievement. These observational designs improve temporal resolution but do not establish that a sleep intervention will raise grades.

Evidence from questionnaire studies is less uniform. In a Singapore residential college, Armand et al. [3] found that global sleep quality and daytime dysfunction did not show the same relationship with academic performance. A Spanish nursing-student study associated short sleep and adverse sleep habits with poorer academic outcomes using an adjusted logistic model [4]. In Malaysia, a Sabah undergraduate study reported a sleep–achievement association using the Sleep Quality Scale rather than the Pittsburgh Sleep Quality Index (PSQI) [5]. Differences in exposure definitions, grading systems, participant selection and adjustment for confounding limit direct comparison of these findings.

Measurement is particularly important when distinguishing a subjective sleep-quality rating from overall sleep quality. The PSQI combines several aspects of sleep using a defined scoring procedure [6,7]. Its global score and individual components represent related but distinct information, and changing response codes or category

thresholds can undermine comparability [8]. An association based on a single subjective rating cannot automatically be interpreted as an association involving the complete PSQI.

The present study addresses a local descriptive question within the Faculty of Education at UiTM Puncak Alam. It aims to describe the distribution of reported sleep characteristics and examine the association between the recorded sleep-quality and academic-performance variables.

METHODS

Design and setting

The study used a quantitative cross-sectional questionnaire design at the Faculty of Education, Universiti Teknologi MARA, Puncak Alam, Malaysia.

Participants and recruitment

The report identifies an estimated faculty population of approximately 2,400 students and a planned sample of 331, selected using the reproduced Krejcie–Morgan sample-size table. This is a survey sample-size rationale, not a documented power calculation for the association analysis. The analysed tables contain 331 respondents across seven education programmes. Recruitment is described as involving social media, email invitations and classroom announcements. The inclusion criteria were current faculty enrolment and age 18–27 years, with students with medical conditions excluded. The appended questionnaire contains demographic questions, sleep items referring to the preceding month, and a short-answer GPA item. Demographic response options cover gender and programme. Sleep questions concern bedtime, sleep latency, waking time, duration, disturbances, medication, daytime functioning and subjective quality; additional roommate questions are also shown. The source identifies the instrument as the PSQI [6]. Standard PSQI scoring produces seven component scores from 0 to 3 and a global score from 0 to 21; higher values indicate poorer sleep [7,8]. Academic performance was elicited using a self-reported GPA question.

RESULTS

Participant characteristics

Table 1 presents the demographic distributions. The largest age category was 24–26 years (144; 43.5%). Gender counts were nearly equal. Physical and Health Education was the largest programme group (83; 25.1%).

Table 1. Participant characteristics (N = 331)

Characteristic	Category	n	%
Age	18–20 years	37	11.2
Age	21–23 years	101	30.5
Age	24–26 years	144	43.5
Age	27 years	49	14.8
Gender	Male	166	50.2
Gender	Female	165	49.8
Programme	Physical and Health Education	83	25.1
Programme	Teaching English as a Second Language	54	16.3

Programme	Art and Design Education	43	13.0
Programme	Science Education Physics	40	12.1
Programme	Science Education Biology	45	13.6
Programme	Science Education Chemistry	33	10.0
Programme	Science Education Mathematics	33	10.0

Sleep characteristics

Table 2 retains all seven sleep-domain distributions. Fairly good sleep was the most frequent subjective rating (40.5%), and 6–7 hours was the most frequent duration category (38.1%). For sleep efficiency, the largest category was >85% (42.9%). The most frequent latency, disturbance and daytime-dysfunction intervals were 5–6, 19–26 and 5–6, respectively. No sleep-medication use during the previous month was reported by 152 respondents (45.9%).

Table 2. Sleep-category distributions (N = 331 per domain)

Domain	**Category as reported**	**n**	**%**
Subjective sleep quality	Very good	53	16.0
Subjective sleep quality	Fairly good	134	40.5
Subjective sleep quality	Fairly bad	99	29.9
Subjective sleep quality	Very bad	45	13.6
Sleep latency	1–2	24	7.3
Sleep latency	3–4	117	35.3
Sleep latency	5–6	125	37.8
Sleep latency	7–8	65	19.6
Sleep duration	>7 hours	46	13.9
Sleep duration	6–7 hours	126	38.1
Sleep duration	5–6 hours	113	34.1
Sleep duration	<5 hours	46	13.9
Sleep efficiency	>85%	142	42.9
Sleep efficiency	75–84%	66	19.9
Sleep efficiency	65–74%	45	13.6
Sleep efficiency	<65%	78	23.6
Sleep disturbance	1–9	19	5.7

Sleep disturbance	10–18	139	42.0
Sleep disturbance	19–26	168	50.8
Sleep disturbance	27–32	5	1.5
Sleep medication	Not during past month	152	45.9
Sleep medication	Less than once a week	70	21.1
Sleep medication	Once or twice a week	79	23.9
Sleep medication	Three or more times a week	30	9.1
Daytime dysfunction	1–2	43	13.0
Daytime dysfunction	3–4	128	38.7
Daytime dysfunction	5–6	133	40.2
Daytime dysfunction	7–8	27	8.2

Table 3. Descriptive statistics for recorded sleep variables

Variable	**Mean**	**Mode**	**SD**
Subjective sleep quality	2.41	2	0.915
Sleep latency	2.70	3	0.867
Sleep duration	2.48	2	0.899
Sleep efficiency	2.18	1	1.217
Sleep disturbance	2.48	3	0.629
Sleep medication	1.96	1	1.031
Daytime dysfunction	2.44	3	0.819

Association with academic performance

The academic-performance variable had a mean of 1.7069 (SD = 0.48171), compared with 2.41 (SD = 0.915) for sleep quality. The Pearson correlation was r = .102, n = 331, with p = .032 explicitly reported for a two-tailed test (Table 4). The magnitude is small. The reported p-value is below .05 for that test; whether a directional test was justified remains unconfirmed. Score direction cannot yet be translated into an association between better sleep and better grades.

Table 4. Available sleep-quality and academic-performance association

Recorded result	**Value**
Academic-performance mean (SD)	1.7069 (0.481)
Sleep-quality mean (SD)	2.41 (0.915)

Pearson correlation, r	.102
Analysis sample, n	331
p-value	.032

DISCUSSION

Principal findings and their limits

The descriptive results indicate varied sleep experiences within the sampled faculty, including substantial representation in the fairly bad subjective-quality category and the shorter duration categories. They do not establish the prevalence of poor sleep using the global PSQI threshold, because the global score was not reported. The recorded sleep-quality–academic-performance association is small, and its substantive direction remains uncertain until both variables are decoded.

The distinction between the predictor and its label is consequential. If increasing subjective-quality codes indicate worse sleep, a positive coefficient cannot be described as evidence that better sleep accompanies higher achievement unless the academic-score direction also supports that interpretation.

Comparison with the evidence base

The present association should not be taken as confirmation that sleep is generally unimportant for academic performance. Okano et al. [1] used repeated wearable measurements and course assessments, whereas this study used a retrospective questionnaire and an incompletely documented academic variable. Their analysis considered multiple sleep features together; it should not be cited as demonstrating a uniformly weak contribution of sleep. Creswell et al. [2] also used prospective measurement and prior-achievement adjustment. The difference in design and temporal alignment is a more defensible explanation for non-comparable estimates than an unsupported claim that stress or time management dominated the UiTM results.

Within Southeast Asia, the Singapore study [3] illustrates why individual sleep domains should not be collapsed conceptually: academic performance was associated with daytime dysfunction, while its association with global PSQI was not statistically significant. The Sabah study [5] provides Malaysian context but used a different sleep scale, so its reported association cannot validate the scoring used here. The nursing-student study [4] further differs in outcome definition and adjustment strategy. Together, these studies suggest that population, measurement and analysis choices can contribute to divergent findings; the present data do not isolate which explanation applies.

The standard PSQI scoring framework [6–8] is therefore central to any revision. Reporting severe or extreme dysfunction based solely on the thesis's category labels would imply validation that has not been demonstrated. Similarly, the 15-item alpha does not establish the reliability of the specific sleep-quality predictor. The centenarian validation study [9] examined a different population and factor structure, reinforcing the need to identify precisely which score was used rather than transferring a general claim of validity.

Implications and further research

These results can motivate a better documented assessment of students' sleep experiences, but they do not quantify the academic benefit of a campus intervention. Trial syntheses by Saruhanjan et al. [11] and Tadros et al. [12] support the potential of psychological interventions to improve sleep in university populations. Their sleep outcomes should not be equated with improved GPA, and heterogeneous interventions should not be presented as interchangeable. Any local programme intended to improve academic attainment would need its own evaluation.

The immediate analytical priority is to reconcile eligibility and coding, then reproduce the original analyses from de-identified data. After confirming whether academic performance is continuous or categorical, the analysis

should use a model appropriate to that outcome and report uncertainty and diagnostics. A rank-based sensitivity analysis may be informative for ordinal sleep ratings, but it has not been conducted here. A subsequent prospective study could align repeated sleep measurement with a defined assessment period and include prior achievement and prespecified potential confounders. These are recommendations for further work, not descriptions of completed analyses.

Strengths and limitations

The study includes respondents from seven education programmes, provides complete descriptive records for the seven reported sleep variables, and includes its questionnaire and an ethics approval letter. These materials allow direct checking of reported distributions. Nevertheless, cross-sectional measurement precludes temporal or causal inference; self-report introduces recall and reporting error; and the single-faculty setting limits generalisability. Sampling implementation, recruitment dates and participant flow are insufficiently documented. Age eligibility conflicts with the observed sample, and the medical-condition exclusion lacks an operational definition.

Further limitations concern undocumented academic-score coding, departures from identifiable PSQI scoring, absent regression output and unverified assumptions. Univariate skewness and kurtosis do not establish linearity, bivariate normality, absence of influential cases or regression residual assumptions. Neither cognition nor stress was tested as a mediator or moderator in the available results.

CONCLUSION

The sample showed varied reported sleep characteristics and a small positive correlation between the recorded sleep-quality and academic-performance variables ($r = .102$; $p = .032$, two-tailed). The available evidence does not establish the direction of a better-sleep–better-grades relationship, an independent predictive effect, or causality. Eligibility, scoring and inferential documentation must be resolved before submission. Any recommendation to improve sleep should be justified in terms of student wellbeing and evaluated rather than presented as a demonstrated route to higher grades.

Ethical Considerations

Appendix B documents approval by the UiTM Ethics Research Committee, reference ED/REC/F/11888.

Conflict Of Interest

There are no conflicts of interest.

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