Sleep Quality and Excessive Daytime Sleepiness

of Filipino Medical Students in a State-run University During the Coronavirus Disease (COVID-19) Pandemic

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Our medical students today are our medical frontliners tomorrow.

In the Philippines, how well are they sleeping during the pandemic?

Objectives:

- To examine **sleep quality** using the Pittsburgh Sleep Quality Index (PSQI).
- To evaluate **daytime sleepiness** using the Epworth Sleepiness Scale (ESS), and compare it with that of a pre-pandemic study.

Introduction

◆ COVID-19 in the Philippines ◆

- Implementation of stay-at-home orders on **15 March 2020.** [1]
- Stay-at-home orders have **continuously remained in effect to date.**[2]

◆ Why the interest in sleep of medical students? ◆

- Sleep is related to **stress, mental health, memory, and learning.**
- Sleep deprivation is associated with **reduced neurocognitive performance.**[3-6]
- A **high prevalence of stress** has been a perennial problem for medical students.[5,7]
- **Novel compounding stressors** during the pandemic: [8-11]
  - The abrupt cessation of the semester
  - Uncertainty in the conduct of classes
  - Altered curricula
  - Shifts in the academic calendar
  - New instructional delivery and assessment methods.

Significance

- Literature on the pandemic's effect on sleep is only emerging.
- Currently **no studies** on sleep of medical students in the Philippines during the pandemic.
- To the authors' knowledge, this study is the **first of its kind in the Philippine setting of the pandemic.**

Participant Eligibility

- **All** medical students under a **single institution.**
  - As consideration for variations in **institution and locale** responses to stay-at-home orders.
  - The only institution with a **previously published sleep study.**

Inclusion	Exclusion
○ Enrolled for the second semester	○ In a leave of absence
○ Provided consent	○ Those without consent

Participant Description

- Participants come from **6 learning units (LUs):**
  - **LUs 1 and 2:** pre-medicine years (in the fast-tracked medicine program), **~40** students per batch
  - **LUs 3 to 6:** medicine proper years, **~180** students per batch
- Academic year 2020-2021, second semester learning arrangements:
  - **LUs 1 to 5:** completely online
  - **LU 6:** resumption of clinical rotations on Jan 2021

Outcome Measures

◆ Epworth Sleepiness Scale (ESS) ◆

- Self-administered questionnaire to assess **general level of sleepiness.**[12]
- Global scores **>10 indicate excessive daytime sleepiness.** [6,13]

◆ Pittsburgh Sleep Quality Index (PSQI) ◆

- Self-administered questionnaire to assess **sleep quality.**[14]
- Global scores **>5 indicate sleep of poor quality.**[14-16]

Methodology

Recruitment

Data Collection

- Survey distribution
- Data management

Analysis and Interpretation

- Data analysis using **Stata® v.13**
- **One-way ANOVA** and **Kruskal-Wallis Test**
- **Breusch-Pagan Test** for heteroscedasticity
- **Bonferroni Test** for pairwise comparisons
- **Somer's D, Pearson's, and Spearman's correlation**
- Significance set to **$p<0.05$.**

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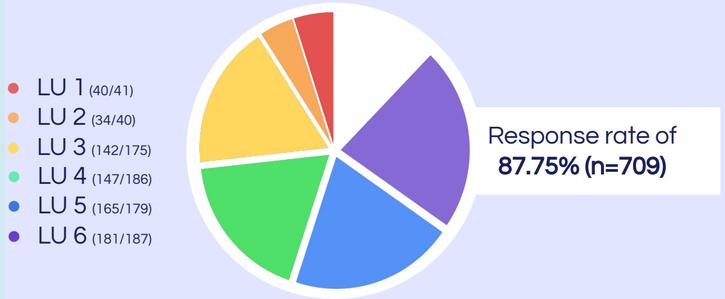
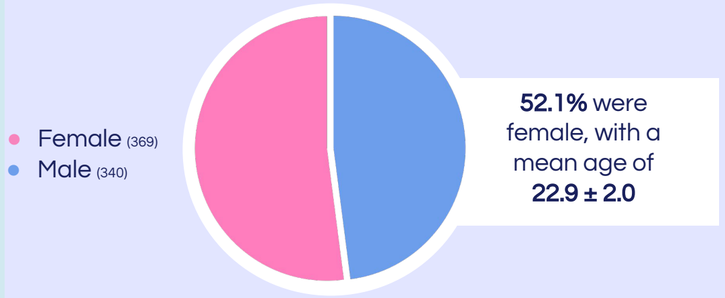
Demographics

◆ Learning Unit Distribution ◆



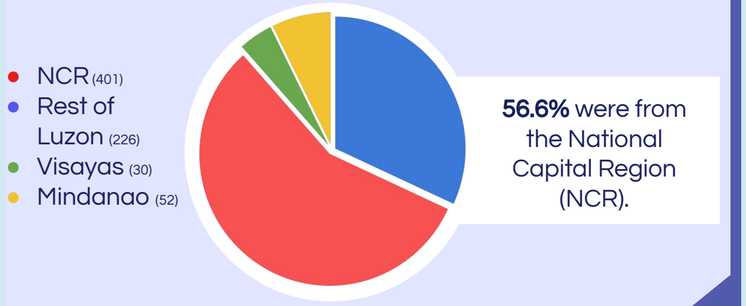
Response rate of **87.75% (n=709)**

◆ Sex Distribution ◆



52.1% were female, with a mean age of **22.9 ± 2.0**

◆ Residence Distribution ◆

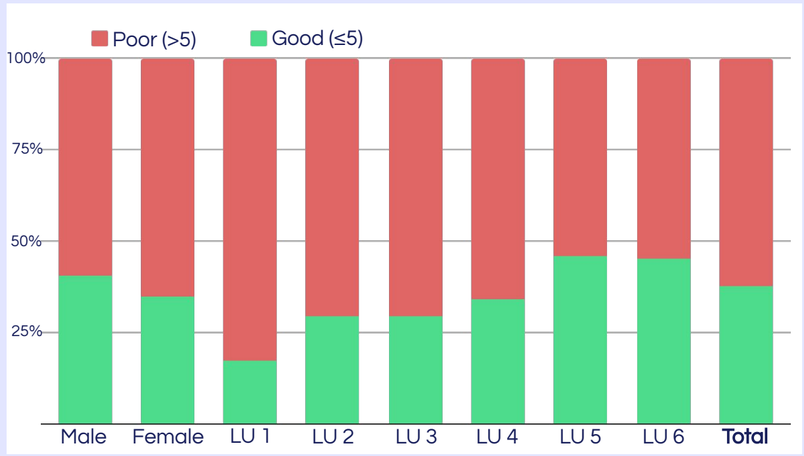


56.6% were from the National Capital Region (NCR).

Sleep Quality

◆ Sleep Quality per Sex and LU ◆

(n=709)



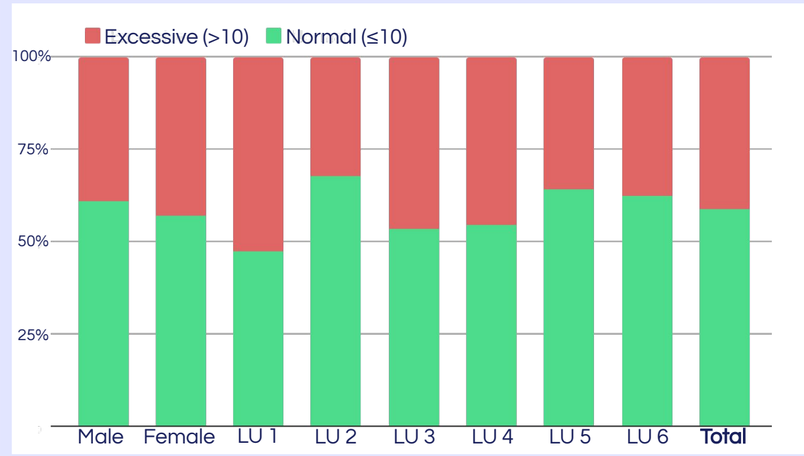
◆ Sleep Quality ◆

- **62.34%** have poor sleep quality.
- A greater percentage of **females** are affected.
- Statistically significant difference in scores among LUs.
- **More than half of each class** have poor sleep quality.
- PSQI scores from areas with stricter lockdowns were not significantly different with those of other regions.
- **Lower year levels tend to be more affected:**
  - Shorter sleep duration for **LU 4** vs. LU 5;
  - Worse day dysfunction for **LUs 1 and 3** vs. LUs 4, 5, and 6;
  - Worse subjective perception of sleep quality by **LUs 3 and 4** vs. LU 6; and
  - Worse sleep quality (global PSQI) in **LU 1** vs. LUs 5 and 6.

Daytime Sleepiness

◆ Degree of Daytime Sleepiness per Sex and LU ◆

(n=709)



◆ Daytime Sleepiness ◆

- **41.18%** have excessive daytime sleepiness.
- A greater percentage of **females** are affected.
- Statistically significant difference in scores among LUs.
- Only **LU 1** had excessive daytime sleepiness in **more than half of the class.**
- ESS scores from areas with stricter lockdowns were not significantly different with those of other regions.
- Relative to a **pre-pandemic study (2016-2017)** by Jorge et al. [6] on a population with similar demographics, **the average ESS scores during the pandemic decreased for almost all LUs.**
  - Statistically significant only for **LUs 1, 2, 3, and 6**.

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Discussion

◆ Greater affectation of females ◆

- Females are **more vulnerable to behavioral changes,** which lead to reduced sleep duration, prolonged sleep latency, and sleep- and stress-related disorders.[16,17]

◆ Greater affectation of lower year levels ◆

- May be attributed to the **transition period** from undergraduate or high school studies to medical studies.[18]
- Requires **adjustment in terms of class load, shifts, breaks, and study periods.**[6,18]
- There is **less likelihood** of poor sleep quality in those **accustomed** to the load in medical education.[17]
- Adjustments to the **transition to online learning** may have also contributed.

◆ Decrease in average ESS scores ◆

- This may be attributed to the effects of **changes in medical education**:
  - More flexible schedules alleviating sleep deprivation [16]
  - Suspended clinical rotations as well as diminished travel time [19]
  - Reduced morning commitments and urgent school demands [20]
- Social media also allows **communication for stress relief.**[21]
- Our findings are **similar to some other studies** of general populations,[16,20] and medical students.[19,22]

◆ High prevalence of poor sleep quality ◆

- Our study with **62.34%** of poor quality sleepers is **much higher than studies from other countries**, both pre-pandemic (39.5%) [23] and during the pandemic (34.6%, 33.2%, 29.5%). [9,24,25]
- It is also **much higher than the reported prevalence estimate of 32-57% from other studies using PSQI.**[23]
- **Differences in local and institutional policies** make comparisons difficult.
- The **effect of local policies in the Philippines**:
  - **Stricter and delayed implementation of quarantine measures** are associated with a higher prevalence of mental health issues.[26,27]
  - The Philippine response to the pandemic is one of the **"longest and strictest lockdowns"** in the world.[28]
  - Nonetheless, cases and deaths rising unabated indicate a **failure** of these strict measures.

◆ Association analysis ◆

- Participant demographics and ESS and PSQI scores have a **significant but weak** correlation.
- ESS and PSQI global scores have a **significantly moderate** correlation.
  - Contrasts some pre-pandemic studies.[30,31]
  - Supported by one study during the pandemic.[29]
  - The **effect of bias with symptom reporting, [31] and of the pandemic on mental health** may be reflected in both assessment tools.

Limitations

- **Limited generalizability:** participants confined to a single institution.
- **Study design:** our cross-sectional study does not permit the establishment of causal relationships.
- **Recall bias:** may be present due to the nature of the tools used, and may be exacerbated in a pandemic.[20]
- **Likely confounders:** effect of local policies are unaccounted for, possible inclusion of participants with sleep disorders.

Conclusion

A large percentage of Filipino medical students experience excessive daytime sleepiness and poor sleep quality during the pandemic.

Students from lower year levels tend to be more affected.

The study reinforces stress and sleep affectation as persistent problems in medical education, and reveals opportunities to improve policy implementation and curricula development with sleep as a main consideration.

We recommend future studies to include other institutions and to account for local policies.

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