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# Sleep, Academic Burnout, and Mental Health: Insights from Medical Interns in Tehran

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## Abstract

**Introduction:** Over the past decade, the importance of sleep for physical and mental health has become increasingly recognized. Medical students face unique challenges and are prone to psychological disorders and the use of sleeping pills. This study examined the relationship among mental health, academic burnout levels, sleeping pill use, and related factors in medical interns at Tehran medical training hospitals in 2022.

**Methods:** We conducted a cross-sectional, descriptive-analytical study of 128 medical interns at Bu Ali and Amir al Momenin Hospitals in Tehran. Data were collected using the Maslach Burnout Inventory (MBI), the General Health Questionnaire (GHQ-28), and a demographic questionnaire.

**Results:** A total of 36.7% of interns reported using sleeping pills. Sedative use was significantly associated with greater social media use and a family history of sedative use. Academic burnout correlated with life satisfaction and sleep duration. GHQ-28 scores showed that age, weight, and height were significantly associated with anxiety and insomnia subscale scores.

**Conclusion:** Sedative use and academic burnout are closely linked and related to modern lifestyle factors such as social media use and life satisfaction. These findings underscore the need to address mental health and sleep hygiene among medical trainees.

## ABBREVIATIONS

**GHQ-28: General Health Questionnaire (28-itemversion); MBI: Maslach Burnout Inventory**

## INTRODUCTION

Sleep is a critical indicator of both physical and mental health and a supporter of high-level learning and well-being. Studies in different countries reveal that medical students are more susceptible to sleep disorders than the general population [1-5]. Approximately eighty percent of students are under-informed about sleep hygiene, and medical students tend to sleep less as academic pressure increases [6,7]. The use of sedative drugs (commonly called sleeping pills) is closely linked to sleep disorders. Such psychoactive drugs induce sleep, treat insomnia, or facilitate anesthesia during surgery, and long-term use can result in addiction and physical dependence [8,9].

An early study in the United States found that 78% of medical students had taken sedatives or psychotropic drugs at least once [10,11]. The relationship between psychological disorders and sleeping pill use is especially relevant, as medical students are at greater risk of both [11-15]. Medical students are also prone to academic burnout. Burnout can be defined as deep disenchantment with one's occupation or studies, characterized by emotional exhaustion, depersonalization or cynicism, and reduced personal accomplishment. Under intense academic pressure, medical students may experience fatigue, loss of motivation, and in some cases substance use [18,19]. Research on sleep disorders in Iran and the Middle East is limited and often outdated. Further studies are needed to consider all factors associated with academic burnout, sleeping pill use, and psychological disorders. Our study at Islamic Azad University of Medical Sciences (Tehran)

aimed to examine the relationship among mental health, academic burnout levels, sleeping pill use, and other factors in medical interns at Tehran's Bu Ali and Amir al Momenin Hospitals during 2022.

## METHODS

We conducted a cross-sectional, descriptive-analytical study of medical interns at Bu Ali and Amir al Momenin Hospitals (affiliated with Tehran Medical Sciences Branch, Islamic Azad University) in 2024. One hundred twenty-eight interns participated and completed three instruments: (1) a demographic questionnaire (Additional file 1); (2) the Maslach Burnout Inventory (MBI, student version) to assess academic burnout (Additional file 2); and (3) the General Health Questionnaire (GHQ-28) to screen for psychiatric symptoms (Additional file 3). The MBI measures three dimensions: academic self-efficacy (six items), emotional exhaustion (seven items), and cynicism (two items [20].

The MBI uses a 7-point Likert scale from 0 (Never) to 6 (Always). Higher scores indicate higher burnout. Reverse scoring was applied to self-efficacy items. The GHQ-28 assesses four subscales (somatic symptoms, anxiety/insomnia, social dysfunction, severe depression) using 28 statements [21]. Each GHQ-28 item is rated on a 0–3 scale from "not at all" to "much more than usual." Total GHQ scores of 22–42 indicate moderate distress, 43–63 indicate severe distress, and 64–84 indicate extremely severe distress. For analysis, we also examined each GHQ-28 subscale separately. All data were analyzed using IBM SPSS Statistics for Windows (version 22.0, Armonk, NY, USA). Continuous variables are reported as mean ± standard error or standard deviation as appropriate.

Categorical data are presented as frequencies and percentages. We used chi-square tests, independent t-tests, and Mann-Whitney U tests to compare groups. A two-tailed $p$ value <0.05 was considered significant. Multiple linear regression was used to identify independent predictors of sedative use. In reporting statistical results, we followed the APA style of one space after each period. Ethical approval was obtained from the Tehran Medical Sciences Branch of Islamic Azad University Ethics Committee (IR.IAU.TMU.REC.1400.006 and IR.IAU.TMU.REC.1399.317). The study adhered to the Declaration of Helsinki. All participants provided informed written consent. Participants were informed that participation was voluntary and anonymous; no personal identifiers were collected.

## RESULTS

### Demographics and Sedative Consumption

The participants (N=128) had a mean age of 25.71 ± 0.20 years and included 83 females (64.8%), and 45 males (35.2%). Overall, 47 interns (36.7%), reported using sleeping pills, while 81 (63.3%) did not. There was no significant association of sedative use with gender or age ($p$>0.67 for both) (Table 1).

### Lifestyle Factors and Sedative Use

Time spent on social media and sleep duration were significantly related to sedative use. Interns using sedatives reported higher social media use ($p$=0.045) and shorter sleep duration ($p$<0.001) than non-users. Additionally, interns using sedatives had more frequent daytime fatigue ($p$=0.003) and a higher likelihood of a family history of sedative use ($p$=0.001). Other factors (marital status, financial status, nationality) were not significantly different between users and non-users.

### Educational Burnout and Sedatives

The overall burnout score was significantly higher among interns who used sedatives (mean ± SE: 68.34 ± 1.17) compared to non-users (53.85 ± 1.17) ($p$<0.001). Analysis of MBI subscales showed that sedative users had higher scores on the academic self-efficacy, emotional exhaustion, and cynicism components (means 27.17, 32.85, 8.32, respectively) than non-users (18.98, 28.91, 5.94) (all $p$<0.001) (Table 2).

### Burnout Correlates

Burnout was significantly associated with life satisfaction (low, medium, high) and sleep duration. Interns reporting lower life satisfaction and shorter sleep had higher burnout scores ($p$=0.0049 and $p$=0.040, respectively). Other demographics (gender, age, weight, GPA) were not significantly correlated with burnout.

### Mental Health Insights

GHQ-28 results showed no significant difference in the four subscale scores between sedative users and non-users ($p$>0.80 for all subscales). However, age, weight, and height were significantly correlated with the anxiety/insomnia subscale (with $p$=0.040, 0.033, 0.013, respectively). Financial status and marital status were associated with some GHQ subscale scores (e.g., anxiety/insomnia, depression), as was nationality in certain domains, though these relationships were complex (Table 3).

### Regression Analysis

Multiple regression analysis showed that our model explained 55% of the variance in sedative use ($R^2$=0.55, $p$<0.001). The Durbin–Watson statistic (2.35) indicated

**Table 1:** Demographic, social, and economic characteristics associated with sedative (sleeping pill) use (percentages of total interns) and *p*-values.

| Variable | Category | % of all interns | % using sedatives | % not using sedatives | P-value |
|---|---|---|---|---|---|
| Gender | Male | 35.2 | 12.5 | 22.6 | 0.841 |
| | Female | 64.8 | 24.2 | 40.6 | |
| Marital status | Single | 79.6 | 28.9 | 50.7 | 0.836 |
| | Married | 20.3 | 7.8 | 12.5 | |
| Social media use (hr/day) | < 1 | 12.5 | 10.0 | 6.0 | 0.045 |
| | 1–2 | 43.8 | 16.0 | 40.0 | |
| | > 2 | 43.8 | 21.0 | 35.0 | |
| Sleep per day (hours) | < 6 | 13.3 | 9.0 | 8.0 | < 0.001 |
| | 6–8 | 67.2 | 21.0 | 65.0 | |
| | > 8 | 19.5 | 17.0 | 8.0 | |
| Family history of sedative use | Yes | 42.2 | 22.6 | 14.0 | 0.001 |
| | No | 57.8 | 19.5 | 43.7 | |
| Daytime fatigue | Often | 18.8 | 12.5 | 6.2 | 0.003 |
| | Normal | 56.3 | 17.9 | 38.2 | |
| | Rarely | 25.0 | 6.2 | 18.7 | |
| Financial status | Above poverty line | 85.9 | 30.4 | 55.4 | 0.463 |
| | Below poverty line | 14.1 | 6.2 | 7.8 | |
| Nationality | Iranian | 94.5 | 34.3 | 60.1 | 0.729 |
| | International | 5.5 | 2.3 | 3.1 | |

**Table 2:** Variables associated with educational burnout (MBI scores): percentages and mean burnout scores (±SD) by category.

| Variable | Category | % of interns | Mean burnout score | SD | P-value |
|---|---|---|---|---|---|
| Sleep per day (hours) | < 6 | 13.3 | 59.41 | 12.38 | 0.040 |
| | 6–8 | 67.2 | 57.51 | 12.03 | |
| | > 8 | 19.5 | 64.72 | 13.29 | |
| Life satisfaction | Low | 3.1 | 74.25 | 7.59 | 0.0049 |
| | Average | 62.5 | 58.80 | 12.37 | |
| | High | 34.4 | 58.48 | 12.57 | |
| Sedative (sleeping pill) use | Yes | 36.7 | 68.34 | 10.16 | <0.001 |
| | No | 63.3 | 53.85 | 10.61 | |

**Table 3:** Correlations between demographic variables and GHQ-28 subscales. Each cell shows Pearson's *r* and *p*-value. '–' indicates not applicable (categorical variable).

| Variable | Anxiety/Insomnia (r) | Anxiety/Insomnia (p) | Depression (r) | Depression (p) | Social Dysfunc. (r) | Social Dysfunc. (p) | Somatic (r) | Somatic (p) |
|---|---|---|---|---|---|---|---|---|
| Age | 0.182 | 0.040 | 0.045 | 0.611 | 0.020 | 0.823 | –0.053 | 0.555 |
| Weight | 0.189 | 0.033 | 0.103 | 0.248 | 0.023 | 0.798 | 0.030 | 0.741 |
| Height | 0.219 | 0.013 | 0.101 | 0.258 | 0.076 | 0.392 | 0.091 | 0.306 |
| Financial status | – | 0.032 | – | 0.004 | – | 0.000 | – | 0.033 |
| Marital status | – | 0.028 | – | 0.468 | – | 0.630 | – | 0.688 |
| Gender | – | 0.116 | – | 0.024 | – | 0.515 | – | 0.210 |
| Nationality | – | 0.071 | – | 0.003 | – | 0.011 | – | 0.228 |

no autocorrelation. Significant predictors of sedative use included daytime fatigue score ($\beta = 0.29$, $p = 0.002$), family history of sedative use ($\beta = -0.086$, $p = 0.020$), and GHQ-28 anxiety/insomnia subscale score ($\beta = 0.03$, $p = 0.003$). (Male gender and smoking status were associated with lower vs. higher odds of sedative use, respectively, but those analyses assumed odds ratios and are not detailed here). The regression models for MBI subscales indicated that our variables explained 28.7% of emotional exhaustion, 29.8% of cynicism, 58% of academic self-efficacy, and 41% of total burnout variance (Table 4).

**Table 4:** Multiple linear regression results for sleeping pill use. Dependent variable: sedative use (coded 0/1).

| Variable | B (unstandardized) | p-value |
|---|---|---|
| Constant | –0.020 | (not applicable) |
| Daytime fatigue score | 0.29 | 0.002 |
| Family history of sedative use | –0.086 | 0.020 |
| GHQ-28 anxiety/insomnia score | 0.03 | 0.003 |

Model statistics: $R^2 = 0.55$; $R = 0.74$; Durbin-Watson = 2.35 ($p < 0.001$ for the overall model).

## DISCUSSION

In this study of medical interns in Tehran, we found that over one-third used sleeping pills, a rate higher than reported in some other countries (e.g. 17–25% in Saudi and Indian medical students)(15, 22). This may reflect the high stress and competitive environment in Iran's medical education. Consistent with prior research, our findings link sedative use to stress-related factors: interns using

sedatives spent more time on social media (a stressor) and had more frequent fatigue. As expected, interns who used sedatives exhibited significantly higher academic burnout. We also found that lower life satisfaction and shorter sleep were associated with higher burnout, highlighting the interconnectedness of personal well-being and academic stress. Interestingly, while sedative use was linked to burnout, GHQ-28 psychiatric symptom scores did not differ significantly between users and non-users. Instead, GHQ subscales were more closely related to demographic factors: age, weight, and height correlated with anxiety/insomnia symptoms in our sample. We also observed that interns from wealthier backgrounds had higher scores on GHQ subscales of psychological symptoms, a finding that contrasts with some expectations and may reflect unique socioeconomic pressures in Iran.

The study has limitations. It was cross-sectional and restricted to a single institution, limiting causal inference and generalizability. Data were self-reported, possibly introducing bias. We also did not identify specific sedatives or prescription practices, which would be important in future work. Our methods were tailored to Tehran's intern population; future studies should clarify these methods in more detail or adapt them to other settings.

## CONCLUSION

This research provides a multi-dimensional snapshot of sleep, burnout, and mental health among medical interns. We found a strong association between sleeping pill use and academic burnout, as well as links to social media use and life satisfaction. These results underscore the need for interventions to promote healthy sleep and mental well-being among medical trainees. Future research should address the noted limitations, examine broader populations, and explore interventions to mitigate burnout and sedative use.

### Authors' Contributions

Masoud Saadat Fakhr – Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft.

Shayan Afshari – Conceptualization, Writing – review & editing.

Kosar Nazari – Investigation, Writing – review & editing.

Shahrzad Khakpour – Writing – review & editing.

Sara Hashemi – Writing – review & editing.

Batool Ghorbani Yekta – Conceptualization, Supervision, Writing – review & editing.

### Availability of Data and Materials

The datasets generated during the current study are available from the corresponding author on reasonable request.

### Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of Tehran Medical Sciences Branch, Islamic Azad University (protocols IR.IAU.TMU.REC.1400.006 and IR.IAU.TMU.REC.1399.317) and conducted according to the Declaration of Helsinki and its later amendments. Informed consent was obtained from all participants. Participation was voluntary and anonymous; participants could withdraw at any time without consequence.

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