# Investigating the Prevalence of Stress and its Relationship with Sleep Quality in University Students: A Study in Iran

**Research Article**

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## Abstract

Introduction: Students are willing to cut back on sleep in order to adapt and cope with their stressful work load and environment. This study examines the prevalence of stress and its relationship with sleep quality. Methods: This cross-sectional study was conducted using available sampling of male and female students of the Nursing and Midwifery Faculty of Jundishapur University of Medical Sciences, Ahvaz in 2022. Pittsburgh Sleep Quality Questionnaire was used to measure sleep quality and Kessler Psychological Distress Scale Questionnaire was used to measure stress. Results: The prevalence of all levels of stress among students was 53.2% (140 people). 61 people (23.2%) experienced mild stress, 35 students (13.3%) experienced moderate stress, and 44 students (16.7%) experienced severe stress. The average score of Kessler's psychological distress (K10) of the participants was $21.9 \pm 7.3$ (maximum = 50). No significant relationship was observed between stress and gender (p=0.25) and academic year (p=0.72). There was a statistically significant relationship between sleep quality and stress (p < 0.001). Conclusion: This study reports the high prevalence of stress and poor sleep quality in students of Ahvaz College of Nursing and Midwifery. This study shows a strong connection between sleep quality and stress.

**Keywords:** Prevalence, Stress, Sleep Quality, Iran.

## Introduction

Stress is one of the mental disorders and is defined as "wear and tear" during which the body adjusts under pressure or a threatening situation, and in this state, a person's mental balance and emotions are disrupted. In fact, tension or stress or nervous pressure in psychology means pressure and force, and any stimulus that causes tension in humans is called a stressor or stress factor. The tension of soul and body and loss of balance is stressful. When stress occurs, the body reacts to restore the lost balance, which is the act of stress. Every person experiences different types of stress depending on their culture, type of upbringing, type of behavior and type of thoughts, and the symptoms of stress can be: sweaty hands, restlessness,

restless legs, playing with fingers, and in more severe cases, Nail biting and hair pulling mentioned (1).

The high prevalence of stress is one of the most important issues related to students working in medical sciences universities worldwide. Many factors make university a stressful environment. Some of these factors include extensive curricula, many academic requirements, and the difficulty and variety of exams (2,3). The level of stress among university students is different around the world, for example, the level of stress among some universities including Pakistan 60%, Thailand 61%, Malaysia 42% and America 57% has been reported (2, 4-6).

Although a number of studies have shown that some levels of stress have good effects on physiological performance and can facilitate the learning process (optimal stress), it is well-confirmed that high levels have a negative effect on physical and mental health. Students and this case of stress is known as unfavorable stress (1). In particular, high levels of stress can affect cognitive function, concentration level and academic performance (8).

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*Zeinab Raiesifar et.al., Investigating the Prevalence of Stress and its Relationship with Sleep Quality in University Students*

Students may not consider sleep as a top priority in terms of their academic requirements as they reduce their sleep time to add hours to study and work load. In the same way, little and inappropriate sleep becomes a habit for them (9). According to reports in various studies, 51% and 59% of medical students in the United States and Lithuania, respectively, have poor sleep quality (10,11).

Since sleep plays an important role in cognitive processes as well as physical and mental health (12,13), sleep deprivation can affect students' academic performance (9). Some studies in the United States, Australia, India and other countries have shown that students who have poor sleep quality get poor grades in their tests and are more likely to suffer from depression than their classmates (16-14). However, there are few studies on the relationship between stress and sleep quality. The results of studies conducted in 1989 and 1997 indicated that sleep disorders can be the cause, symptom or accompaniment of stress or psychiatric disorders (17,18). Another study showed that stress causes many problems in sleep, such as restless sleep, sudden jumping out of sleep and light sleep (19). In another study conducted on medical students with the aim of investigating the relationship between stress and sleep quality, the results indicated that stress and poor sleep have a significant relationship with each other (20).

Considering the destructive effects that stress has on the mental health of students, as well as the effects of insomnia on the health and performance of students, researchers decided to conduct a study with the aim of determining the amount of stress and its relationship with the quality of sleep in students of the Faculty of Nursing and Midwifery in Ahvaz. to be conducted in 2022 and as a basic study, its results can be used in future planning and prevent the effects of stress and adverse sleep quality in operating room, nursing and midwifery students who play a significant role in providing health to the society.

## Material and Methods

In order to conduct this descriptive-cross-sectional study, after the plan was approved by the research council of Jundishapur University of Medical Sciences in Ahvaz and approved by the ethics committee of this university, as well as obtaining the necessary written permission from the university's vice president for research, the researcher went to the research site and the necessary coordination with the officials of the relevant unit started its work. Then the researcher went to Jundishapur Nursing and Midwifery College and introduced himself and gave a brief explanation about the objectives of the research and after obtaining their consent if they had the conditions to participate in the study, he provided the questionnaires to the research units. These units included undergraduate students studying nursing and midwifery in the operating room of Jundishapur University of Medical Sciences, Ahvaz. Finally, the students answered the questions in the presence of the researcher and in the faculty of nursing and midwifery

and after the researcher explained about the different sections of the questionnaires and the method of answering them, and they were given the right to ask questions whenever they wanted. Refrain from answering. After answering, the questionnaires were collected by the researcher himself. Students who refused to participate in the study or did not complete the questionnaire were excluded from the study. In this study, available sampling method was used.

The instrument of this study consisted of three sections: the first section was based on demographic and lifestyle information, the second section was the Kessler Psychological Distress Scale (K10) and the third section was the Pittsburgh Sleep Quality Index (PSQI). Demographic and lifestyle variables included: age, gender, academic year and place of residence.

The Kessler Psychological Distress Scale (K10), developed by Kessler, is an instrument widely used in many epidemiological studies to assess the stress that students have experienced during the past few weeks (21). This questionnaire contains ten questions. It is about emotional states, each of which has a five-point Likert scale from "never" to "all the time" and is scored from 1 to 5, respectively. The lowest possible score is 10 and the highest possible score is 50. Scores were classified as follows: 20-24 as mild stress, 25-29 as moderate stress, and 50-30 as severe stress. This questionnaire has good psychometric properties with Cronbach's alpha of 0.89 (21).

The last questionnaire includes the Pittsburgh Sleep Quality Index (PSQI), which was used to measure sleep quality and patterns in the last month (22). PSQI is a standard questionnaire to evaluate subjective sleep quality (23,24). The questions are set on a 4-point Likert scale (0-3) and analysed seven factors including: subjective sleep quality, sleep latency, sleep duration, normal sleep efficiency, sleep disorders, use of sleeping pills, and daily dysfunction. Scores for each component are added to obtain a total score (range 0–21).

Data were analysed using SPSS version 16. The relationship between sleep quality and stress as well as demographic variables was investigated using the Pearson Chi-square test. Sleep quality was used as dependent variable and stress level and demographic variables were used as independent variables. Tests with p-value <0.05 were considered statistically significant.

## Results

Out of 306 students, 263 (86%) completed and returned the questionnaire. The average age of the participants was 21.9 ± 1.4 years. All participants were undergraduates. The majority of participants were male (68.8%, n = 181).

The prevalence of all levels of stress among students was 53.2% (140 people). 61 people (23.2%) experienced mild stress, 35 students (13.3%) experienced moderate stress, and 44 students (16.7%) experienced severe stress. The average score of Kessler's psychological distress (K10) of the participants was 21.9 ± 7.3 (maximum = 50). As shown in Table 2, no significant relationship was observed

between stress and gender (p=0.25) and academic year (p=0.72).

The prevalence of poor sleep quality (PSQI score ≥ 5) among students was 76% (200 people) and the average PSQI score was 7.11 ± 3.84 (maximum 21). Of the seven PSQI components, the mean scores of subjective sleep quality, sleep latency, sleep duration, and daytime dysfunction were above 1, making them the highest contributing subscales in the PSQI score. However, usual sleep efficiency, sleep disorders, and use of sleep medications had mean scores below 1. Table 1 shows that 36.6% of students (n = 97) reported going to bed at 12:00 while 33.1% (n = 87) reported going to bed later than 12:00. However, the majority (73.4%, n = 193) had less than seven hours of sleep per night with a mean of 1.3 ± 5.8 hours of actual sleep (ranging from 2 to 10 hours). Most of them (74.5%, n = 196) took less than 30 minutes to fall asleep (mean 32 ± 33 minutes, range 1-210 minutes). Notably, only 32.3% (n = 84) of students specifically stated that their sleep quality was fairly bad or very bad, and the majority (67.7%, n = 176) rated their sleep quality as fairly good or very good.

There was a statistically significant relationship between sleep quality and stress (p < 0.001). The relationship between sleep quality and study variables of the participants is shown in Table 3. This shows that there is a statistically significant relationship between sleep quality and current grade point average (p = 0.03).

### Table 1: Demographics and characteristics of the participants

| Characteristics | Level | n | % |
|---|---|---|---|
| Sex | Male | 181 | 68.8 |
| | Female | 82 | 31.2 |
| Academic year | 1st year | 99 | 37.6 |
| | 2nd year | 61 | 23.2 |
| | 3rd year | 56 | 21.3 |
| | 4th year | 47 | 17.9 |
| Living with family | No | 20 | 7.6 |
| | Yes | 243 | 92.4 |
| Time of going to bed | Before 00:00 | 60 | 22.8 |
| | 00:00–00:59 | 97 | 36.9 |
| | 01:00–01:59 | 46 | 17.5 |
| | 02:00–02:59 | 41 | 15.6 |
| | After 3:00 | 19 | 7.2 |
| Time of getting up in the morning | Before 6:00 | 42 | 16 |
| | 6:00–6:59 | 58 | 22.1 |
| | 7:00–7:59 | 87 | 33.1 |
| | 8:00–8:59 | 59 | 22.4 |
| | After 9:00 | 17 | 6.5 |
| Hours of sleep at night | <7 h | 193 | 73.4 |
| | ≥7 h | 70 | 26.6 |

### Table 2: The association between stress and the study variables

| Characteristics | Level | Well n | % | Stressed n | % | p-value |
|---|---|---|---|---|---|---|
| Sleep quality | Good | 44 | 69.8 | 19 | 30.2 | <0.001* |
| | Poor | 79 | 39.5 | 121 | 60.5 | |
| Sex | Male | 89 | 49.2 | 92 | 50.8 | 0.25 |
| | Female | 34 | 41.5 | 48 | 58.5 | |
| Academic year | 1st year | 42 | 42.4 | 57 | 57.6 | 0.72 |
| | 2nd year | 29 | 47.5 | 32 | 52.5 | |
| | 3rd year | 28 | 50 | 28 | 50 | |
| | 4th year | 24 | 51.1 | 23 | 48.9 | |
| *Significant p value (<0.05) | | | | | | |

### Table 3: The association between sleep quality and the study variables

| Characteristics | Level | Poor Sleep Quality n | % | Good Sleep Quality n | % | p-value |
|---|---|---|---|---|---|---|
| Stress | Negative | 79 | 64.2 | 44 | 35.8 | <0.001* |
| | Positive | 121 | 86.4 | 19 | 13.6 | |
| Sex | Male | 134 | 74.0 | 47 | 26.0 | 0.26 |
| | Female | 66 | 80.5 | 16 | 19.5 | |
| Academic year | 1st year | 79 | 79.8 | 20 | 20.2 | 0.72 |
| | 2nd year | 45 | 73.8 | 16 | 26.2 | |
| | 3rd year | 42 | 75.0 | 14 | 25.0 | |
| | 4th year | 34 | 72.3 | 13 | 27.7 | |
| *Significant p value (<0.05) | | | | | | |

## Discussion

The present study provided evidence of a high prevalence of psychological stress (53%) and a high and perhaps even alarming prevalence of poor sleep quality (76%). The prevalence of stress in this study is comparable to other studies conducted in different countries such as Pakistan (60%) (2), Thailand (61%) (4) and the United States (57%) (6), but it is higher. From what was reported in a study in Malaysia (42%) (5). The prevalence of poor sleep quality in this study is

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*Zeinab Raiesifar et.al., Investigating the Prevalence of Stress and its Relationship with Sleep Quality in University Students*

higher than that reported in other studies, with the prevalence of poor sleep quality ranging from 30 to 59% (10,7). This variation could either be due to the different tools used to measure stress and sleep quality in these studies or due to different underlying causes.

The significant proportion of stress and poor sleep quality among students is a cause for concern because it may have a negative impact on their quality of life, emotional and physical health, and learning process, which in turn may have negative consequences on the quality of patient care in the future of students.

The present study shows a significant relationship between stress and sleep quality in students. This suggests that high levels of stress are a major predictor and cause of poor sleep quality. The results showed that the prevalence of poor sleep quality among stressed students is 86%, while 64% of non-stressed students had poor sleep. This is similar to the findings of a recent study conducted at a private medical school in Pakistan, where a strong association was found between poor sleep and academic stressors (2). Many studies have shown that sleep and stress are closely related to the hypothalamic-pituitary-adrenal (HPA) axis, which may explain the close relationship between these two factors (25,26). Acute stress is associated with a decrease in slow wave and rapid eye movement (REM), and sleep deprivation as a stressor has prominent effects on sleep and circadian rhythms (26).

In general, due to the multiple demands of the academic environment, students tend to reduce their sleeping hours to increase the time available for studying. They may not consider sleep as a top priority compared to studying and other academic needs. As a result, they suffer from lack of sleep and stress, especially in the weeks before the examination (27). This is the result of a vicious cycle in which students try to cope with multiple academic demands and stressors by reducing sleep time, resulting in lack of sleep and poor quality sleep, which increases their stress levels. This cycle requires appropriate interventions that focus on promoting good sleep hygiene and providing students with alternative skills to cope with their stressful and competitive environment.

In this study, no significant relationship was found between gender and sleep quality and stress. This result is consistent with many previous studies, where no significant relationship was found between sex level and stress and sleep quality (11,28,29). However, the design of the present study limits the detailed analysis of gender differences. More studies are needed to investigate these differences.

Although the present study reports several important and significant findings, there are limitations in its cross-sectional design, including the impossibility of establishing a cause-effect relationship between sleep quality and stress and the possibility of recall bias due to the use of self-report questionnaires in addition to This is the study sample representing a nursing and midwifery faculty, and the results cannot necessarily be generalised to the Iranian student population.

# Conclusion

This study reports the high prevalence of stress and poor sleep quality in students of Ahvaz College of Nursing and Midwifery. This study shows a strong connection between sleep quality and stress. Based on these findings, students need urgent education about sleep hygiene and the negative consequences of poor sleep quality.

**Conflict of interest**

There is no conflict of interest for the authors in this study.

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