



## Sleep Quality Among Teenage Female Nursing Students

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### Abstract

**Background:** Sleep is vital for people of any age. For teens, though, profound mental, physical, social, and emotional development requires quality sleep. Sleep benefits the brain and promotes attention, memory, and analytical thought. **Aim of the study:** Assess sleep quality among teenage female nursing students. **Subjects and methods:** **Research design:** A cross-sectional descriptive design was used to achieve aim of the current study. **Setting:** The current study was conducted in five secondary nursing schools in Sharkia Governorate. **Subjects:** A random multi-stage cluster sampling technique was used. The study sample composed of 400 female students who fulfilled inclusion criteria. **Tools of data collection:** A four-part structured interview questionnaire was developed by the researcher to collect the necessary data: Part I: Socio-demographic data sheet. Part II: Student's health status. Part III: Student's dietary habits. Part IV The Pittsburgh Sleep Quality Index (PSQI). **Results:** The study revealed that three-fifth of the study sample had poor sleep quality and showed that eat breakfast, perceived good diet and balanced diet were statistically significant independent negative predictor of poor sleep. **Conclusion:** Female nursing students complain from poor sleep quality. **Recommendations:** Health education programs regarding different strategies for improving sleep quality. Further researches to study factors affecting sleep in large scale. **Keywords:** Sleep quality, teenage, female nursing students..

### Introduction

Adolescence is a period of many biological, psychological, and social changes, including, but not limited to, sleep, identity, independence, and relationships with caregivers and peers. Sleep and wake timing during adolescence tends to drift later, due to the maturation of the two bioregulatory processes of sleep: reduced sleep homeostatic pressure and delayed circadian timing<sup>1</sup>.

The average sleep duration recommended for adolescents is approximately 9.35 h a night for optimal cognitive functioning<sup>2</sup>. However, many adolescents in their home environments are not meeting this nightly sleep need, receiving ~7e8 h per night<sup>3</sup>. This discrepancy between sleep need assessed in the laboratory and sleep in the home environment highlights that psychosocial factors,

such as school start times, socialising, device use, and bedtime autonomy, are likely to be contributing to sleep loss<sup>4</sup>.

Sleep also facilitates expansive thinking that can spur creativity. Whether it's studying for a test, learning an instrument, or acquiring job skills, sleep is essential for teens. Given the importance of sleep for brain function, it's easy to see why teens who don't get enough sleep tend to suffer from excessive drowsiness and lack of attention that can harm their academic performance<sup>5</sup>.

Sleep is defined as a reversible engagement with unresponsiveness to the external environment, regularly alternating in a circadian manner with engagement and responsiveness. It is one of the human behaviors and is a vital

biological need. It is a function of the brain and sufficient sleep is necessary not only to function appropriately when awake but is also vital to stay alive. In humans death is immediate without oxygen, occurs after about 72 h if deprived of water and takes approximately 3–5 weeks without food. Death to occur due to lack of sleep can vary from days to weeks<sup>6</sup>.

Adequate sleep and sleep quality are important determinants of adolescents' physical and mental health and cognitive development. Insufficient sleep and other sleep problems, including sleep disturbance, can harm adolescents' emotional wellbeing, mood, attention, daytime functioning, and educational attainment. Insufficient sleep and impaired sleep quality have also been associated with obesity, which is a common risk factor for future cardio metabolic disorders such as diabetes and cardiovascular disease during adulthood. Identifying modifiable risk factors for sleep disturbance can therefore be critical to improving adolescents' health<sup>7</sup>.

Community health nurse plays a major role in exploring the young person's (and where appropriate, the family's) understanding of sleep and discussing sleep hygiene is a useful first management strategy. The concept of sleep hygiene relates to establishing a set regimen that in turn encourages a regular sleep and wake pattern. Important aspects of this include avoiding daytime naps, avoiding stimulant usage (including caffeine) in the afternoon, only using the bed for sleeping, ensuring a calm and relaxing sleep environment, encouraging exposure to natural daylight and encouraging exercise<sup>21</sup>.

#### **Significance of the study:**

Nowadays, sleep problems are common and are likely to increase. Over the past few years, sleep quality among young adults has been decreasing, as revealed by several studies and reports<sup>8</sup>. Sleep deprivation in adolescents is common. The Youth Risk Behavior Survey found that 72.7% of students reported an average of <8 hours of sleep on school nights<sup>9</sup>. Thus, the investigation of sleep quality among teenage could shed some light on possible prevention and treatment suggestion for poor sleep quality among teenage students.

#### **Aim of the study:**

#### **The aim of the study:**

Assess sleep quality among teenage female nursing students.

#### **Research questions:**

1. What is the sleep quality among teenage female nursing students?
2. What are the factors affecting sleep quality among teenage female nursing students?

#### **Subjects and methods:**

##### **Research design:**

A cross-sectional descriptive design was used to conduct the present study.

##### **Study setting:**

The current study was conducted in five secondary nursing schools. These schools were Sherif Omar, Fakous, Abou-Kebir, Alibrahimiah and Alhosayneya, which randomly selected from nursing schools in Sharkia Governorate.

##### **Study subjects:**

The study sample composed of 400 female students from the above mentioned nursing schools and fulfilled the following **inclusion criteria:**

- Age: 15-19.
- Agree to participate in the study.
- Free from any physical and mental diseases.

##### **Sampling technique:**

In recruiting the secondary nursing students for the current study, a random multi-stage cluster sampling technique was used as follows:

##### ✓ **Stage 1:**

At this stage, the researcher randomly selected four centers from Sharkia Governorate, which consists of 13 centers, 4 cities, and 2 districts. These centers were Fakous, Abou-Kebir, Alibrahimiah, and Alhosayneya.

##### ✓ **Stage 2:**

The researcher took the available nursing schools in each center mentioned previously at this stage:

- Fakous nursing school and Sherif Omar nursing school from Fakous center.
- Abou-Kebir nursing school from Abou-Kebir center.
- Alibrahimiah nursing school from Alibrahimiah center.

- Alhosayneya nursing school from Alhosayneya center.

✓ **Stage 3:**

This stage involved the selection of the students from each nursing school according to the criteria for inclusion.

**Tools for data collection:**

In the light of the current relevant literature, a four-part structured interview questionnaire was developed by the researcher to collect the necessary data, including: Socio-demographic data, student's health status, student's dietary habits and Pittsburgh Sleep Quality Index (PSQI).

➤ **Part I: Socio-demographic data:**

Involved:

- **General characteristics of the student** such as: student's age, grade, no. of siblings, birth order ... etc. In addition to questions about hobbies and previous fail.
- **Family data** such as: Parent's educational level, occupation, family type, family income, pocket money and residence ... etc.

➤ **Part II: Student's health status:**

It was developed by the researcher through reviewing related literature, and included questions to collect data about student's health status such as: worry about developmental changes during adolescence, smoking, exercise ... etc..

➤ **Part III: Student's dietary habits:**

The researcher developed this part through a review of the current related literature, for assessing student's dietary habits. This was done by gathering data on students' daily food intake frequency, students' weekly dietary intake as recommended, and students' last week intake of junk food. It included questions such as: Breakfast, eat 3 meals, eat main meal with family daily, eat more between meals, eat in front of TV, type of food, mastication, number of serving per day, fast food, risks of fast food... etc.

**Part IV: The Pittsburgh Sleep Quality Index (PSQI):**

It was developed by **Daniel Buysse**<sup>10</sup> and his colleagues at the University of Pittsburg. The Pittsburgh Sleep Quality Index (PSQI) is a short standardized self-reported questionnaire and the

most widely used subjective measure of sleep quality and disturbances over a one-month period. It consists of 19-basic items, in addition to five clinical items that are answered by residents with the individual in the room during sleep (whether in a single bed or a shared bed), and they are not included in the calculation of scores on the seven indicators of the scale or the total score of the scale.

The basic 19 items are combined to yield seven indicators scores. These seven dimensions/ indicators can be broadly categorized into two factors:

**A. Sleep efficiency factors:**

1. Subjective Sleep quality: item 6
2. Sleep latency: item 2 and 5a
3. Sleep duration: item 4, and
4. Habitual sleep efficiency: items 1, 3, and 4.

**B. Sleep disturbance factors:**

5. Sleep disturbance: items 5b to 5j
6. Use of sleeping medications: item 7, and
7. Daytime disturbance/dysfunction: items 8, and 9.

The first four items of PSQI ask participants about the usual bedtime, length of time to fall asleep, usual wake-up time, and duration of actual sleep. The rest of the 15 Likert-type items inquire about the frequency of sleep disturbances and subjective sleep quality within the past month<sup>10</sup>. The PSQI has high reliability and validity in measuring sleep quality<sup>11</sup>.

In the current study, the researcher used the translated Arabic version of this questionnaire by<sup>12</sup>.

**Scoring system:**

**PSQI (Sleep):** The PSQI consists of 19 self-rated questions. The items are combined to form seven component scores or subscales: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. No scores are typically computed for the last two items that ask questions of the bed partner. For each component, scores can range from 0 to 3, with higher scores denoting poorer sleep. In addition, the seven component scores are summed to yield one global score that ranges from 0 to 21, with higher scores denoting poorer sleep quality. The global score has a cut-off of  $\geq 5$  that has been

used to distinguish poor sleepers ( $\geq 5$ ) from good sleepers ( $< 5$ )<sup>10</sup>.

**Validity & Reliability:**

The tool was revised by a three panel of experts in the field of community health nursing, and community medicine, Zagazig University who conducted content validity of all the items of the tool for relevance, clarity, comprehensiveness and understandability. All recommended modifications were performed.

The reliability of this tool was tested through measuring its internal consistency assessed by calculating Cronbach Alpha Coefficient. The reliability proved to be satisfactory as shown by the values of Cronbach Alpha Coefficient is 0.83.

**Field work:**

The field work of this study was completed within 3 months between October 2022 and December 2022. Once permissions were granted to proceed with the study, the researcher met with the directors of the selected nursing schools and explained to them the study aim as well as the data collection tool. The researcher went to schools, introduced herself to students in classrooms, and explained to them the purpose and nature of the study and the data collection form. The students were reassured that the information obtained is strictly confidential, and would not be used for any purposes other than research. They were asked to fill in the questionnaire under the guidance of the researcher who stayed in the classroom to answer any specific questions that arose while students completed the questionnaire. It took the student about 30 to 40 minutes to complete answering the questions.

The researcher visited the secondary nursing schools two times per week for collection of data, from 9:00 AM to 1:00 PM. The days for data collection were selected according to the work schedule of the school.

**Pilot study :**

A pilot study was done on 40 students representing 10% of the calculated total sample size to assess the feasibility, and comprehension of the items, to estimate the exact time required for filling out the questionnaire, and to evaluate the applicability of the tool. All of them received a clear explanation for the study purpose.

According to the results of the pilot study no modification made to the tool. So, the students involved in the pilot study were included in the study sample.

**Administrative and Ethical consideration:**

The official permission was obtained from the health management directorate at Zagazig city based on letters from the postgraduate affairs department, at the faculty of nursing, Zagazig University explaining the aim and procedures of the present study. Then, director of training and schools department referred the researcher to the directors of the selected secondary nursing schools with the approval letters. Then the researcher met with each of them and explained the aim of the study and the nature of tool used for data collection. The researcher gave the director of each school a copy of the tool and the formal letters.

Prior to embarking on the study, ethical approval was obtained from the Scientific Research Ethics Committee (REC) at the Faculty of Nursing, Zagazig University. Official permissions were obtained from relevant authorities to proceed with the study based on the letter from the Faculty of Nursing explaining the aim and procedures of the study. Then, the researcher met the directors of the selected nursing schools with the approval letter and explained the aim of the study and the nature of the tools used for data collection. It was also clarified that participants have the right to refuse or withdraw from the study at any time without giving any reason and that any obtained information will be used for the research purpose only and will remain anonymous and confidential. Oral informed consent for participation was obtained from each student after full explanation of the aim of the study. In addition, confidentiality and anonymity of the participants were assured through coding of all the data.

**Statistical analysis:**

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to



assess the reliability of the developed tools through their internal consistency. Qualitative categorical variables were compared using chi-square test. In order to identify the independent predictors of sleep score, multiple linear regression analysis was used and analysis of variance for the full regression models was done. To identify the independent predictors of the risk of poor sleep, multiple logistic regression analysis was used. Statistical significance was considered at  $p$ -value  $<0.05$ .

### Results:

**Table (1)** reveals that 35.3% of students in the study sample were at the age of 17, 87.8% of them had 3 siblings or more, and 60.8% of them were not the first child. Regarding marital status, 92.3% of them were single. As for residence, 78.3% of them belonged to rural areas. Additionally, 98.8% of them lived with the family. As well, 52.5% of them had hobbies and 92.8% of students had not previous school failure.

**Table (2):** shows that 56.3% of fathers of the study sample had basic and secondary education, and 58.5% of them were workers. Regarding mothers' characteristics, 59.3% of them had basic and secondary education, and 77.8% of them were housewives. Concerning family type, 88% of them belonged to nuclear families, and 86% of families had sufficient income and saved. As well, 84.8% of students had sufficient pocket money.

**Table(3)** displays the health characteristics of students in the study sample. the general health of students was normal as perceived by 85.5% of them. As well, 67.3% of them were unworried about the changes that occur during adolescence.

**Table(4)** clarifies that 93.3% of the study sample was non smokers. Regarding exercise, 40% of students practiced exercises, and 80% of them performed it for less than 120 minute per week.

**Table(5)** clarifies that the higher percentage of students did not take the breakfast, ate main meal with the family, masticated well, eating in front of the TV, and consumed three meals (62.3%, 84.5%, 81.5%, 79.3%, 40.5%) respectively.

**Figure 1** displays that 58% of students were poor sleepers.

**Table (6)** displays that 66.0% of the study sample had very good sleep duration, 97.3% had very good sleep efficiency.

**Table(7)** demonstrates best fitting multiple linear regression model for PSQI poor sleep score. Worry about adolescence changes and previous fail were statistically significant independent positive predictors of PSQI poor sleep score. Conversely, eating breakfast and a balanced diet were statistically significant independent negative predictors of PSQI poor sleep score. According to the  $r$ -square value, the model explains 0.49% of the variation in this score.

**Table(8)** shows that the school year, and previous academic failure were statistically significant independent positive predictors of poor sleep. As well, take breakfast, perceived good diet and balanced diet were statistically significant independent negative predictor of poor sleep. According to the value of  $r$ -square, the model explains 0.16% of the variation in this score.

### Discussion :

Regarding sleep quality among students in the study sample, the existing study results displayed that three-fifth of students had poor total sleep quality. This might be due to poor academic performance and stress.

Similarly, **Şimşek & Tekgül (2019)**<sup>13</sup> conducted study in Turkey revealed that 82.0% of students had poor sleep quality (PSQI scores  $>5$ ). As well, **Wheaton et al. (2018)**<sup>14</sup> done a study in United States stated that 57.8% of students were poor sleeper.

On the same way, a study conducted by **Li et al. (2023)**<sup>15</sup> in China revealed that 76.4% of adolescents had insufficient sleep quality.

Considering best fitting multiple linear regression model for PSQI poor sleep score, study results revealed that worry about adolescence changes was statistically significant independent positive predictors of PSQI poor sleep score. From the researcher point of view, this might be due to increase of anxiety due to physiological changes occurring in adolescent's body that affect sleep quality.

This finding was on the same way with **Cavalcanti et al (2021)**<sup>16</sup> conducted a study in

Brazil found positive correlation between the quality of sleep and adolescence maturity.

Additionally, previous fail was statistically significant independent positive predictors of PSQI poor sleep score. This might be due to anxiety due to poor school performance can affect sleep quality among students.

On the same context, a study conducted by **Hershner (2020)**<sup>17</sup> in United States found that a correlation was found between poor academic performance and students' sleep quality.

Eating breakfast and a balanced diet were statistically significant independent gnegative predictors of PSQI poor sleep score. This might be due to that healthy eating habits predispose to good sleep behavior among teenagers.

This finding was agree with, **Alibabaei et al. (2021)**<sup>18</sup> conducted a study in Iran reported that there may be a direct relation between adherence to healthy diets and longer sleep duration.

Additionally, **Bacaro et al. (2020)**<sup>19</sup> done a study in Italy assumed that long sleep duration was consistently associated with healthy dietary patterns, such as “Vegetables & Healthy Proteins”, “Traditional”, “Fruit & Vegetables”, etc.

As well, **Otsuka et al. (2019)**<sup>20</sup> carried out a study in Japan found that adolescents with lower

sleep quality also tended to demonstrate adverse health-related behaviors, such as skipping breakfast.

### Conclusion :

Regarding sleep quality among students in the study sample, the existing study results displayed that three-fifth of students had poor total sleep quality. Regarding factors of poor sleep score, worry about adolescence changes and previous fail were statistically significant independent positive predictors of PSQI poor sleep score. Conversely, taking breakfast and a balanced diet were statistically significant independent negative predictors of PSQI poor sleep score.

### Recommendations:

- 1- Health education programs regarding different strategies for improving sleep quality.
- 2- Further researches should be developed to confirm the study results.
- 3- Replicate the study on a large scale to permit generalization of the results.

**Table (1): Socio-demographic characteristics of students in the study sample (n=400)**

|                  | Frequency | Percent |
|------------------|-----------|---------|
| Age:             |           |         |
| <16              | 71        | 17.8    |
| 16-              | 129       | 32.3    |
| 17-              | 141       | 35.3    |
| 18+              | 59        | 14.8    |
| Range            | 15.0-19.0 |         |
| Mean±SD          | 16.5±1.0  |         |
| Median           | 15.5      |         |
| School year:     |           |         |
| I                | 114       | 28.5    |
| II               | 149       | 37.3    |
| III              | 137       | 34.3    |
| No. of siblings: |           |         |
| 1-2              | 49        | 12.3    |
| 3+               | 351       | 87.8    |
| Range            | 1-7       |         |
| Mean±SD          | 3.6±1.0   |         |
| Median           | 4.0       |         |
| Firstborn:       |           |         |
| No               | 243       | 60.8    |
| Yes              | 157       | 39.3    |
| Marital status:  |           |         |

|                          |     |      |
|--------------------------|-----|------|
| Single                   | 369 | 92.3 |
| Engaged                  | 31  | 7.8  |
| Residence:               |     |      |
| Rural                    | 313 | 78.3 |
| Urban                    | 87  | 21.8 |
| Live with family:        |     |      |
| No                       | 5   | 1.3  |
| Yes                      | 395 | 98.8 |
| Have hobbies:            |     |      |
| No                       | 190 | 47.5 |
| Yes                      | 210 | 52.5 |
| Previous school failure: |     |      |
| Never                    | 371 | 92.8 |
| Once                     | 25  | 6.3  |
| >1                       | 4   | 1.0  |

Table (2): Family characteristics of students in the study sample (n=400)

|                       | Frequency | Percent |
|-----------------------|-----------|---------|
| Father education:     |           |         |
| None                  | 43        | 10.8    |
| Basic/secondary       | 225       | 56.3    |
| University            | 132       | 33.0    |
| Father job:           |           |         |
| Employee              | 147       | 36.8    |
| Manual worker         | 234       | 58.5    |
| Retired               | 19        | 4.8     |
| Mother education:     |           |         |
| None                  | 49        | 12.3    |
| Basic/secondary       | 237       | 59.3    |
| University            | 114       | 28.5    |
| Mother job:           |           |         |
| Housewife             | 311       | 77.8    |
| Working               | 89        | 22.3    |
| Family type:          |           |         |
| Nuclear               | 352       | 88.0    |
| Extended              | 48        | 12.0    |
| Parents cohabiting:   |           |         |
| No                    | 21        | 5.3     |
| Yes                   | 379       | 94.8    |
| Crowding index:       |           |         |
| <2                    | 270       | 67.5    |
| 2+                    | 130       | 32.5    |
| Family income:        |           |         |
| Insufficient          | 56        | 14.0    |
| Sufficient/saving     | 344       | 86.0    |
| Have pocket money:    |           |         |
| No                    | 6         | 1.5     |
| Yes                   | 394       | 98.5    |
| Pocket money (n=394): |           |         |
| Insufficient          | 18        | 4.6     |

|                  |     |      |
|------------------|-----|------|
| Sufficient       | 334 | 84.8 |
| More than enough | 42  | 10.7 |
| Media at home:   |     |      |
| Dish             | 368 | 92.0 |
| Computer         | 191 | 47.8 |
| Internet         | 315 | 78.8 |

**Table (3): Health characteristics of students in the study sample (n=400)**

|                                    | Frequency | Percent |
|------------------------------------|-----------|---------|
| General health perception:         |           |         |
| Excellent                          | 42        | 10.5    |
| Normal                             | 342       | 85.5    |
| Weak                               | 16        | 4.0     |
| Worried about adolescence changes: |           |         |
| No                                 | 269       | 67.3    |
| Yes                                | 131       | 32.8    |

**Table 4: Health behaviors of students in the study sample (n=400)**

|                            | Frequency | Percent |
|----------------------------|-----------|---------|
| Smoking:                   |           |         |
| No                         | 373       | 93.3    |
| Yes                        | 27        | 6.8     |
| Exercise:                  |           |         |
| No                         | 240       | 60.0    |
| Yes                        | 160       | 40.0    |
| Exercise hrs/week (n=160): |           |         |
| <120                       | 128       | 80.0    |
| 120+                       | 32        | 20.0    |

**Table (5): Dietary habits as reported by students in the study sample (n=400)**

|                               | Frequency | Percent |
|-------------------------------|-----------|---------|
| Eat breakfast:                |           |         |
| No                            | 249       | 62.3    |
| Yes                           | 151       | 37.8    |
| Reasons (n=249): <sup>@</sup> |           |         |
| No time                       | 107       | 43.0    |
| Not used to                   | 35        | 14.1    |
| No appetite                   | 104       | 41.8    |
| Not available                 | 22        | 8.8     |
| Prefer to eat with friends    | 67        | 26.9    |
| Other                         | 41        | 16.5    |
| Eat 3 meals                   | 162       | 40.5    |
| Eat main meal with family     | 338       | 84.5    |
| Eat between meals             | 113       | 28.3    |
| Eat in front of TV            | 317       | 79.3    |
| Eat in a hurry                | 135       | 33.8    |
| Good mastication              | 326       | 81.5    |
| Force self to stop eating     | 85        | 21.3    |



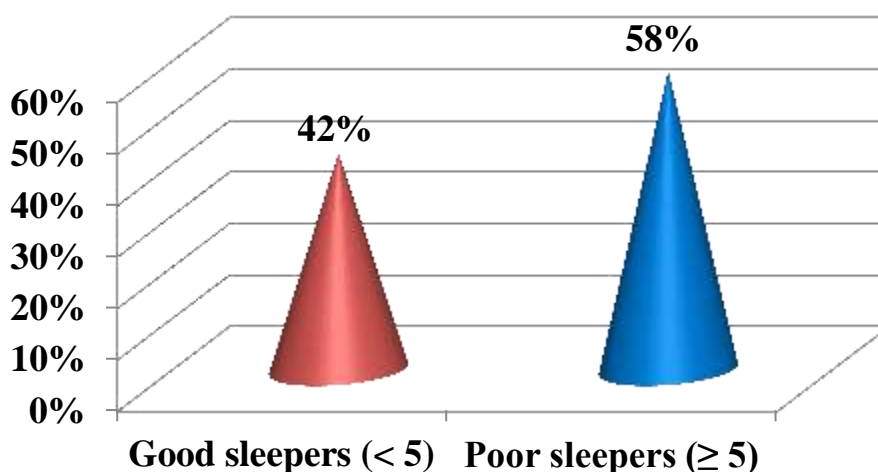


Figure 1: Overall sleep quality among students in the study sample (n=400)

Table (6): Sleep quality among students in the study sample (n=400)

| Sleep quality        | Very good |      | Good |      | Bad  |      | Very bad |      |
|----------------------|-----------|------|------|------|------|------|----------|------|
|                      | No.       | %    | No.  | %    | No.  | %    | No.      | %    |
|                      | Duration  | 264  | 66.0 | 75   | 18.8 | 41   | 10.3     | 20   |
| Efficiency           | 389       | 97.3 | 10   | 2.5  | 1    | 0.3  | 0        | 0.0  |
| Disturbance          | 12        | 3.0  | 225  | 56.3 | 150  | 37.5 | 13       | 3.3  |
| Latency              | 10        | 2.5  | 296  | 74.0 | 88   | 22.0 | 6        | 1.5  |
| Use sleep medication | 243       | 85.8 | 28   | 7.0  | 22   | 5.5  | 7        | 1.8  |
| Daytime functioning  | 5         | 1.3  | 61   | 15.3 | 288  | 72.0 | 46       | 11.5 |

Table (7): Best fitting multiple linear regression model for the PSQI poor sleep score

|                           | Unstandardized Coefficients |            | Standardized Coefficients | t-test | p-value | 95% Confidence Interval for B |       |
|---------------------------|-----------------------------|------------|---------------------------|--------|---------|-------------------------------|-------|
|                           | B                           | Std. Error |                           |        |         | Lower                         | Upper |
| Constant                  | 5.41                        | 1.12       |                           | 4.844  | <0.001  | 3.06                          | 7.77  |
| Worried about adolescence | 2.42                        | 0.89       | 0.50                      | 2.710  | 0.015   | 0.54                          | 4.30  |
| Previous fail             | 4.10                        | 0.96       | 0.76                      | 4.277  | 0.001   | 2.08                          | 6.12  |
| Eat breakfast             | -3.03                       | 0.91       | -0.62                     | -3.342 | 0.004   | -4.94                         | -1.12 |
| Balanced diet             | -1.90                       | 0.45       | -0.92                     | -4.278 | 0.001   | -2.84                         | -0.97 |

r-square=0.49

Model ANOVA: F=5.25, p=0.004

Variables entered and excluded: age, birth order, marital status, residence, parents' education and job, live with family, income, crowding index, disability, medications, junk food frequency, exercise

Table (8): Best fitting multiple logistic regression model for poor sleep

|  | Wald | Df | P | OR | 95.0% CI |
|--|------|----|---|----|----------|
|--|------|----|---|----|----------|

|  |        |   |      |      | for OR |       |
|--|--------|---|------|------|--------|-------|
|  |        |   |      |      | Upper  | Lower |
| Constant                                     | 8.400  | 1 | .004 | 7.82 |        |       |
| School year                                  | 8.917  | 1 | .003 | 1.53 | 1.16   | 2.03  |
| Engaged                                      | 4.708  | 1 | .030 | 0.40 | 0.18   | 0.92  |
| Previous fail                                | 3.300  | 1 | .069 | 2.13 | 0.94   | 4.80  |
| Eat breakfast                                | 12.836 | 1 | .000 | 0.45 | 0.29   | 0.69  |
| Perceived good diet                          | 4.051  | 1 | .044 | 0.72 | 0.53   | 0.99  |
| Balanced diet                                | 6.991  | 1 | .008 | 0.79 | 0.67   | 0.94  |
| Nagelkerke R Square: 0.16                    |        |   |      |      |        |       |
| Hosmer and Lemeshow Test: p=0.499            |        |   |      |      |        |       |
| Omnibus Tests of Model Coefficients: p<0.001 |        |   |      |      |        |       |

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