



## Relationship between Menstrual Cycle Regularity and Sleep Quality

Authors

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### Abstract

Women report more sleep disturbance than men which suggests sleep may be correlated with reproductive function in women. The aim of this study is to determine the relationship between menstrual cycle regularity and quality of sleep. A total of 113 subjects of age 18 to 21 years participated in the study. After getting consent they were given a Pittsburgh Sleep Quality Index (PSQI) questionnaire. Quality of sleep was assessed by measuring seven domains. Scoring of the answers is based on a 0 to 3 scale. Sleep quality was found to be good with a higher percentage of 62.31 in subjects with regular menstrual cycle; whereas subjects with irregular menstrual cycle have only 38.63 percentages. Our study results show the inverse relationship existing between menstrual irregularity and sleep quality

**Keywords:** menstrual cycle regularity, sleep quality

### Introduction

Menstrual disorders frequently affect the quality of life of adolescents and young adult women. Menstrual disorders include menstrual cycle irregularities (of duration or length), hypermenorrhoea, hypomenorrhoea, polymenorrhoea, oligomenorrhoea, dysmenorrhoea, amenorrhoea, menorrhagia and premenstrual syndrome (PMS)<sup>1</sup>. Irregular menstrual period was defined as <21 or >35 days<sup>2</sup>. Women commonly experience irregular menstrual cycles during their reproductively fertile years. A Women's body has a lot of physical, biological and psychological changes. Women report more sleep disturbance than men<sup>3,4</sup> which suggests sleep may be correlated with reproductive function in women. Menstrual cycle irregularity has been reported to be associated with serious health outcomes such as breast cancer, Type

2 diabetes, cardiovascular disease, osteoporosis and infertility and mental health problems. Inadequate sleep causes daytime malfunctioning, psychological and behavioural problems, and physical diseases including obesity. The poor quality sleep may disturb the circadian rhythm, which affects the menstrual cycle of females. Objective of this study was aimed to assess relationship of menstrual regularity and sleep quality.

### Materials and Methods

A total of 113 subjects of age 18 to 21 years participated in the study. A structured questionnaire was given to collect information about menstrual cycle. They were given a Pittsburgh Sleep Quality Index (PSQI) questionnaire. Before filling the questionnaire they were instructed to read the instruction carefully & informed that the survey was

anonymous. Informed consent was obtained from the participants.

**Inclusion criteria**

A total of 113 females aged 18 – 21 year participated in this survey

**Exclusion criteria**

BMI of 33kg/ m<sup>2</sup> or greater, psychological problem, endocrine disorders, any current medical diseases, female taking hormone therapy or hormonal contraceptives, female having amenorrhea, any medication known to affect sleep .

The Pittsburgh Sleep Quality Index (PSQI)<sup>5</sup> is an effective instrument used to measure the quality and patterns of sleep in the adult. It differentiates “poor” from “good” sleep by measuring seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction over the last month. Scoring of the answers is based on a 0 to 3 scale.

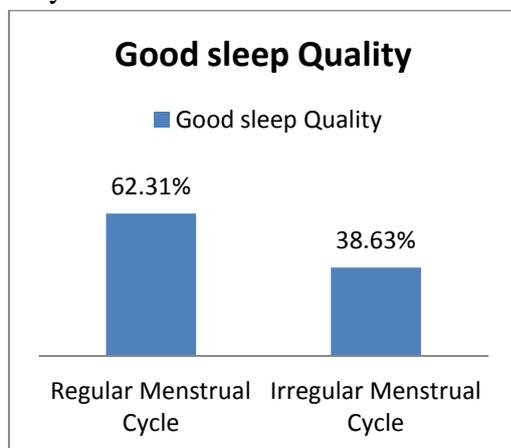
- Score 0 – Very good sleep
- Score 1 – Fairly good
- Score 2 - Fairly bad
- Score 3 - Very bad

At the end total scoring was calculated and overall sleep quality was rated. The global score greater than five reflects poor sleep.

**Results**

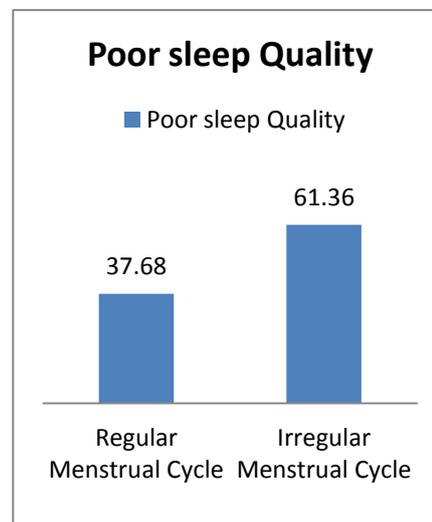
Our study results are explained in the Fig.1 and Fig.2

**Fig.1** Relationship between good sleep quality and menstrual cycle



Subjects with regular menstrual cycle had 62.31% good sleep quality and 37.68% had poor sleep Quality

**Fig.2** Relationship between poor sleep quality and menstrual cycle



Subjects with irregular menstrual cycle had 37.63% good sleep quality and 61.36% had poor sleep Quality.

**Discussion**

Considering high prevalence of women suffering from menstrual irregularities<sup>6</sup> associated with changes in circadian rhythm<sup>7</sup>; the present study was conducted to determine the relationship between menstrual cycle regularity and sleep quality in 113 young females between the age group of 18- 25 years.

Our study results show the inverse relationship existing between menstrual irregularity and sleep quality. Sleep quality was found to be good with a higher percentage of 62.31 in subjects with regular menstrual cycle; whereas subjects with irregular menstrual cycle have only 38.63 percentages. It is also found that 37.68 and 61.36 percentages of poor sleep quality was found among subjects with regular menstrual cycle and subjects with irregular menstrual cycle respectively.

Present study found that poor sleep quality is associated with increased risk of menstrual cycle irregularity in young females. Several studies have

found that sleep quality is associated with the menstrual cycle phase<sup>6,7,8,9,10,11</sup>; Vice versa menstrual cycle irregularity may also be linked with changes in luteinizing hormone resulting from disturbances of circadian rhythmicity<sup>12,13</sup>. All these finding from previous studies are supportive to the results obtained from our study.

Above results can be supported by the findings of many previous studies, in which women with ovulatory menstrual cycles have a circadian rhythm superimposed on the menstrual-associated rhythm. It is also suggested that the amplitude of melatonin and cortisol may also be blunted in the luteal phase. Subjective sleep quality was found to be lower around menstrual phase, but the timing and composition of sleep remains relatively stable across the menstrual cycle in healthy women. In addition, reduced rapid eye movement (REM) sleep during the luteal phase was also noted by few researchers.

All the above findings suggest that disturbances in menstrual function are associated with impaired sleep quality; which is associated with reduced melatonin secretion<sup>7</sup>. Significant increase in sleep onset latency and a significant decrease in sleep quality were found during the luteal phase; Women having premenstrual symptoms reported greater luteal increase in daytime sleepiness, with increase in severity<sup>8</sup>.

Subjectively women appear to feel a greater need for sleep and report poor and insufficient sleep more often than men, which may manifest with higher amplitude of slow-wave sleep in the EEG in women. These changes may be caused by neurosteroids acting on the brain. Less rapid-eye movement (REM) sleep is noticed during luteal phase with progesterone predomination. This is also associated with increased daytime sleepiness, lethargy and fatigue<sup>9</sup>.

Future study is planned to establish the relationship between menstrual cycle length, differences phases of menstrual cycle and premenstrual symptoms with quality of sleep. And it will also help to assess the etiology of menstrual cycle irregularity and its influence on sleep respectively.

## Conclusions

In the present study, results showed that females with regular cycles had a greater percentage of good sleep quality than females with irregular cycles. The current study highlights the importance of adequate sleep duration with better mental health on menstrual cycle regularity of female adolescents. A replication study is needed to increase the reliability and validity of the findings of the current study.

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