Article title: Association of Insomnia and Academic Stress with the onset of Dysmenorrhea among females of Lahore, Pakistan
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ASSOCIATION OF INSOMNIA AND ACADEMIC STRESS WITH THE ONSET OF PRIMARY DYSMENORRHEA AMONG FEMALES OF LAHORE, PAKISTAN

ABSTRACT
Disturbed sleep and menstrual symptoms are prevalent health conditions with limited successful treatments. This study aimed to detect the association between sleep problems and menstrual symptoms among young women in Lahore. In this cross-sectional study, 150 young women aged 12 to 25 years and residing in Lahore City were recruited using a multistage random method. The participants were interviewed for their premenstrual disorders, primary dysmenorrhea, average daily hours of sleep, academic stress, smoking habits, menstrual health, family history and insomnia during the previous 3 months.

INTRODUCTION
Many women experience menstruation related health problems during their reproductively fertile years, such as menstrual cycle irregularity, menstrual pain, irregular flow and premenstrual syndrome such as Dysmenorrhea (1). Dysmenorrhea, which is the most common gynaecological problem among adolescent girls and women of reproductive age. It can be either primary dysmenorrhoea or Secondary dysmenorrhoea. Primary dysmenorrhea (PD) refers to painful menses or cramps in the lower abdomen before or during menstruation in the absence of any identifiable pelvic disease. It is a painful cramping that lasts for 8-72 hours that is most severe during the early days of menstruation. It is an extremely common and sometimes debilitating condition for women of reproductive age. 10-35% of the general population are affected by insufficient or nonrestorative sleep, among which women have higher prevalence of sleep disturbance than men (2,3). Sleep disturbance has many health, behavioural, occupational, and academic consequences in otherwise healthy individuals as well as those with underlying medical conditions. In comparison with men, women report more sleep disorders and pose a greater risk of insomnia (4). The high prevalence of insomnia in women is often attributed to hormonal fluctuations, or gynaecological dysfunctions, such as dysmenorrhea. Some women get afflicted with alternative oversleeping in a short while before or simultaneously at the beginning of menstruation. Biological factors might include earlier age at menarche, heavier menstrual flow, and family history of dysmenorrhea, psychological factors include stress, anxiety, and
depression, social factors include a lower level of social support and lifestyle factors include cigarette smoking and irregular diet. 25% of women in the world suffer from menstrual pain, which leads to work productivity loss (5). Most Medical Students have a poor sleep quality due to their academic tasks during their study. This poor sleep quality has a role in the pathogenesis of pain, including primary dysmenorrhea. This study aims to know the relationship between sleep quality and the prevalence of primary dysmenorrhea (6). Several studies imply that sleep may correlate with reproductive function in females. A population-based cross-sectional study conducted in Korea found that female adolescents with menstrual cycle irregularity have significantly shorter sleep duration and higher depressive mood than those without menstrual cycle irregularity (7).

However, the association between the sleep disturbance and the menstruation of females in Pakistan has not been studied yet. This work was aimed at investigating the relationship of the sleep pattern and the menstruation to healthy, young, ovulating women. Therefore, the purpose of our current study is to investigate the association of Primary Dysmenorrhea with poor sleep quality and academic stress among women in Lahore, Pakistan.

**OBJECTIVES**

- To determine the frequency of dysmenorrhea among women.
- To evaluate the relationship between dysmenorrhea and sleep quality.
- To examine prevalence and risk factors associated with primary dysmenorrhea.
- To study the association between dysmenorrhoea and academic stress in women.
- To investigate the combined effects of sleep quality and academic stress in patients with primary dysmenorrhea.

**METHODOLOGY**

**Materials/Tools:**

A descriptive and cross-sectional survey-based study was conducted at the Department of Biotechnology, Kinnaird College. Questionnaires were formulated and organized with the help of platform: Google Forms. A designed questionnaire including questions regarding menstrual cycle, menstruation pain, life style habits, nutritional habits, and symptoms associated with menstrual pain, was used. The structured questionnaire survey form comprised of 26 closed-ended questions which was used to collect primary data for the
purpose of analyzing the relation between dysmenorrhea (pelvic pain during periods) and insomnia and then the relation of dysmenorrhea with academic stress. The questionnaire had three sections: the first section was based on demographic characteristics and a set of lifestyle factors, the second section asked questions related to menstrual cycle history while the third section focused on sleeping habits. Questions were put together in such a way that each question targeted at least one of the two factors suspected of playing major role in dysmenorrhea.

Data Collection:

The target population included women who were menstruating monthly. The exclusion criteria were as follows: (1) women who were pregnant or breastfeeding, (2) women having gynecological conditions like PCOs (3) women who had suffered menopause and (4) Women with any endocrine disorders, chronic disease or who had undergone major surgery. [8] Women who met the inclusion and exclusion criteria were asked to fill in the questionnaire survey. The target population was from different cities including Lahore, Peshawar, Islamabad and Karachi etc. The survey was distributed through online platforms like WhatsApp, Facebook and Instagram. Personal information of participants was kept confidential so that no ethical laws could be breeched during data collection through survey.

Statistical analysis:

The responses received were 151 and these 151 responses were considered the final sample size. A dataset was prepared prior to the analysis. The data was then analyzed using statistical software IBM SPSS version 22. The descriptive statistics including means and standard deviations for categorical variables were obtained. Group differences were calculated using Independent t Test and Chi-square Test for the categorical variables pelvic pain, academic stress and insomnia. Multiple Logistic Regression analysis was used to figure out the impact of insomnia and academic stress on dysmenorrhea. A p-value less than 0.05 was considered to be significant.

RESULTS

A total of 151 Pakistani women belonging to Lahore city between age group 17-35 years participated in this survey research. Age of menarche of these women varied between 11-18 years. The descriptive statistics calculated the mean age and of menarche of women. The
mean appeared to be 22 years and the mean age of menarche was 13 years. In this study, the relation of insomnia and academic stress with onset of dysmenorrhea was studied in females.

**Insomnia and dysmenorrhea:**

The relation between insomnia and dysmenorrhea was examined. Statistical analysis was done to determine the association of insomnia with onset of primary dysmenorrhea in females. An independent t-test between insomnia and dysmenorrhea to check association between the two variables. The p-value that this test generated was **0.035**, it shows significant effect of insomnia on onset of dysmenorrhea. Then a Pearson’s Chi-Square test was performed and the results given p-value of **0.011**, it also shows highly significant effect of insomnia and dysmenorrhea. The results of multiple regression analysis gave the p-value of **0.000** when dysmenorrhea and insomnia were compared, that shows significant relation of insomnia with dysmenorrhea. So, these statistical results confirmed the association of insomnia with primary dysmenorrhea in women.

*Table 1: Results of statistical tests performed to check association between insomnia and dysmenorrhea in women*

<table>
<thead>
<tr>
<th>No.</th>
<th>Statistical tests</th>
<th>P-Value</th>
<th>Level of significance</th>
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<tbody>
<tr>
<td>1.</td>
<td>Independent t-test</td>
<td>0.035</td>
<td>0.05</td>
</tr>
<tr>
<td>2.</td>
<td>Pearson’s Chi square test</td>
<td>0.011</td>
<td>0.05</td>
</tr>
<tr>
<td>3.</td>
<td>Multiple Regression Analysis</td>
<td>0.000</td>
<td>0.05</td>
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**Academic stress and dysmenorrhea:**

To further examine the effect of academic stress on dysmenorrhea, independent t-test, Chi-Square test and multiple regression analysis were done. The p-value for independent t-test was appeared to be **0.78**, this shows that there is no association between academic stress and dysmenorrhea. The p-value for Pearson’s Chi-Square test was **0.163**, this also rules out any significant relation between the two variables. P-value for Multiple Regression Analysis appeared to be **0.61** that is also greater than level of significance. So, the results showed that there is no significant relation between academic stress and primary dysmenorrhea.
Table 2: Results of statistical tests for testing association of academic stress and dysmenorrhea

<table>
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**DISCUSSION**

Through our findings we came to know that poor sleep quality and insomnia are leading cause of menstrual problems that ultimately led to primary dysmenorrhea in women of Lahore, Pakistan. Although other factors were also included in our study but according to our research this was the main cause. This factor was seen mostly in young aged females.

The results showed that the women with insomnia are more likely to have dysmenorrhea as compared to those who are not experiencing insomnia. Poor sleep quality and insomnia are related to onset of primary dysmenorrhea according to this research study. The other variable i.e., academic stress does not seem to have any association with dysmenorrhea in women.

The current study provides confirmation of association between insomnia and severity of dysmenorrhea in women. The results indicate that women suffering from insomnia and taking < 4 hours of sleep are more likely to have primary dysmenorrhea. This sleep disturbance might be affected by academic stress of females, but there is no direct relation between academic stress and dysmenorrhea according to our results.

Several limitations were present in this research study that are notable. Firstly, the data of this study was based on self-report. Secondly, there was no formal clinical assessment of the mentioned problems. Thirdly, the participants who were interested and also those who were facing the problem were included in the study to avoid biased results.

**CONCLUSION**

The results of current study showed that insomnia and poor sleep quality are associated with increased risk dysmenorrhea in females of Lahore, Pakistan. The effect of academic stress was also tested if it has any association with onset of dysmenorrhea. The results showed that academic stress is not directly associated with dysmenorrhea in women under study.
REFERENCES: