

In the name of God

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**Sleep Disruption and its Correlation to Psychological Distress Among
Medical Students.**

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Abstract:

Background: Medical students are a population who are at great risk to develop sleep disruption due to demanding clinical and academic duties. Knowing how much change in sleep – wake pattern is associated with subsequent psychological distress could be useful to establish a systematic mental health program in medical schools.

Methods: We performed a cross-sectional study to identify the sleep quality and its correlation to psychological distress among 159 medical students.

The instruments employed for data collection were a self report sleep- wake questionnaire, Pittsburg sleep quality index (PSQI), the general health questionnaire (GHQ) and a general questionnaire regarding demographic characteristics, use of drugs and history of psychopathology.

Result: In descriptive analysis 57.2% of subjects were defined as poor sleeper. Moreover, there was a significant correlation between sleep quality and general health status of students ($r=.6$, $p=.000$, $n=159$). Further Regression analysis showed that number of sleep disruption was a predictor for both sleep quality and psychological distress.

Conclusion: Sleep disruption due to shift work or other academic demanding could be a predictor for mental health morbidity in medical students which should be considered in education and mental health policy for this group of students.

Keywords: Sleep disruption, medical students, psychological distress.

Introduction:

Difficulty in sleeping under stressor due to various living style needs appears to be a great risk factor for physical and mental health status, At first glance; low sleep may result in over activity and increase productivity, but in long term lack of sufficient sleep may lead to psychological distress and low productivity.⁽¹⁾ Study recruiting healthy samples revealed that even low levels of sleepiness have an adverse influence on general health.⁽²⁾ Studies have demonstrated that poor sleep quality, sleep disruption and change in regular Sleep-wake pattern may cause physical and psychological burden such as impairment in job performance ,decreased work efficiency and learning disability.⁽³⁻⁸⁾ For example , Partinen et al reported an association between Inadequate sleep and cardiovascular disease and mortality.^(9,10)

Medical students is a populations that appears to be at increased risk for sleep deprivation due to demanding academic and clinical duties which in coexistent with change in living style such a s poor accommodation, being away from family put them at greater risk of poor sleeping and its subsequent mental and physical morbidity. A long prospective study at the John Hopkins University showed that insomnia during medical school is indicative of a subsequent depression and other psychiatric distress persisting at least for 30 years.⁽¹¹⁾ Lima et al in one study in Brazil concluded that different class schedule changing sleep wake pattern led to poor academic performance in medical students.⁽¹²⁾ In Puvanendran study on a

group of junior medical doctors in Singapore, it was noted that sleep deprivation due to night call adversely effect mood and general health.⁽¹³⁾ In a study on medical student in Estonia it was determined that sleep problems were related to anxiety and depressive symptoms.⁽¹⁴⁾ Considering the probability of remarkable change in sleep wake pattern of medical students under academic and clinical stress motivated us to conduct this study with the aim of survey the quality of sleep, its associated factors and the correlation of sleep pattern to general health status of a group of medical students. Knowing how much change in sleep – wake is a predictive factors for poor sleep quality and psychological distress could be useful to establish a systematic mental health program in medical schools.

Method:

Subjects:

The study sample covered medical students in Shiraz University of Medical sciences, Iran. Participants were divided according the year of school and the questionnaire were distributed before main lectures and subjects answered individually and voluntary following instruction by a trained research assistant. Students filled out a socio demographic questionnaire including two extra questions re the history of substance and psychiatric disorders. Information on sleep – wake pattern of students over the past months was obtained by a self-report sleep questionnaire addressing number of nights that participants had experi-

enced change in their regular sleep week pattern because of shift work or other academic or personal needs like preparation for exam or traveling. To detect the quality of sleep we administered the Pittsburg sleep quality index (PSQI) 15, a client self rater instruments differentiating poor sleep from good sleep by measuring seven areas of sleep habits over the past month.. General health status (psychiatry distress) was assessed by Farsi version of general health questionnaire (GHQ), a widely used and valid instrument for detecting the nonspecific psychiatric distress 16. From 202 students answered to the questionnaires , those who did not provide clear information questionnaires or reported history of current substance dependence or psychiatry disorder were excluded and 159 subjects including 79 male (49.7%) and 80 female (50%) age ranged from 17 to 28 (mean 21.5) left for analysis.

Statistics:

Data was processed using statistical package of SPSS 11.5. Descriptive analysis was used to describe demographic characteristics. To determine differences in means of GHQ and PSQI scores among groups according their sleep pattern and socio demographic variables multivariate analysis of variance (MANOVA) and independent t -test were carried out. Regression analysis was performed to determine the predictability of background and sleep related variables for psychiatric distress or quality of sleep. Pearson's correlation coefficient was used to test the correlation between psychiatric dis-

tress and the quality of sleep in study sample.

Results:

The socio demographic characteristics of the study population are presented in table 1.

In descriptive analysis 104 students (65.4%) reported sleep disruption at least for one night per week over the past month {60 (37.7%), 1 or 2 night, 44(27.7%) 3 or more night} and 55 students (34.6%) did not report change in their usual sleep-wake pattern.

Of 159 subjects, 91(57.2%) were defined as poor sleeper according to PSQI score while 68 (42.8%) subjects felt in good sleeper group. In Pearson co relational analysis there was a significant linear correlation between GHQ score and PSQI score ($r = .6$, $p = .000$, $n = 159$). Further analysis including multiple analysis of variance (MANOVA) comparing means of GHQ and PSQI scores between groups based on demographic variables sex, field , years of schools, residential status and sleep related variables failed to detect significant difference between groups for PSQI scores and GHQ score. yet independent t-test comparing means of GHQ and PSQI score between subjects who reported sleep disruption at least for one night per week and those who did not report sleep disruption there was significant difference in mean of GHQ ($p = .034$). Subjects who reported nights with sleep disruption had more psychological distress than those with no sleep disruption. In regression analyses, quality of sleep and number of nights with sleep disruption (NONWSD) were predic-

tors for psychological distress. Table 2 provides result of regression analyses.

Table 1: demographic characteristics of study sample.

Socio demographics	N	%
Age		
Mean	21.52	
SD	2.67	
Sex		
Female	80	50.3
Male	79	49.7
Residential status		
With family	55	34.6
Without family	104	65.4
Years of school		
Year 1	38	23.9
Year 2	25	15.7
Year 3	12	7.5
Year 4	26	16.4
Year 5	20	12.6
Year 6 or more	38	23.9

Table2. Regression analysis of GHQ

Variables entered	r	R2	df	Adjusted r	Significant F
PSQI score					
NONWSD*	.616	.380	2	.372	.000

*NONWSD= Number of nights with Sleep disruption

Note: excluded variables = age, sex, year of school, residential status.

Discussion:

Working on a shift work schedule and changes in sleep wake pattern is a risk for sleep deprivation and its subsequent mental and physical morbidity. Studies conducted with professionals submitted to shift work have revealed that a high percentage of errors during work are due to partial sleep deprivation. The various effects of sleep deprivation include neuro physiological alterations like decreased alertness, psychological alterations such as mood variations, and direct effects on

performance. Various studies supported the effect of Shift work de synchronization on psychological and physical status of under and postgraduate nurses resulting in sleep disturbances , change in immune functioning and other psychobiologic problems.⁽¹⁷⁻¹⁹⁾

Medical students are populations who are at increased risk for sleep disturbance. Sleep disruption in medical students may happen because they are involved in simultaneously clinical and academic duties. There is some evidence that insom-

nia and sleep disruption under stress is a potential predictive factor for development of depression in medical students. Results from our study revealed that a significant proportion of medical students (65.4%) had experienced sleep disruption at least for one night per week due to hospital roster or other academic needs in the previous month; moreover, more than half of participants (57.2%) were poor sleeper. These findings are not consistent with earlier studies. For instance, veldi et al in a survey on 413 medical students using different sleep questionnaire found that only 7% of participants subjectively reported poor sleep quality. In veldi study sleep quality was associated with living condition, leisure activity but not to students workload.⁽²⁰⁾ Whereas in current study variables such as accommodation status, year of school were not a significant predictors for poor sleep quality and subsequent psychological distress:

The main finding of this study is that sleep disruption due to shift work or other academic needs and poor sleep quality significantly linked to psychological distress in medical students. This finding is in the line with previous studies recruiting medical students. Chang et al in a 34 years prospective study on 1053 men in John Hopkins University concluded that insomnia in young men is a relative risk factor for subsequent clinical depression.⁽¹¹⁾ In a cross sectional study in Brazil, Hidalgo and colleagues found that fewer than 7 hours sleep per day in association with insomnia, arousal and other sleep disturbances have a significant risk ratio for developing minor psychiatric disorders.⁽²¹⁾ In a study on medical stu-

dent in Estonia it was determined that sleep problems were related to anxiety and depressive symptoms.⁽¹⁴⁾ Although poor sleep quality could be an aspect of psychological distress, but it is unlikely that sleep complaint being the only symptoms of mental health morbidity. Vollrath et al. observed that 52 % of insomnia were free of anxiety and depression and insomnia at age 21 is no a precursor for the onset of depression or anxiety within a 2 year follow up.⁽²²⁾ In addition to that, in present study, we excluded subjects who reported history of mental disorders. Concluding that sleep disruption due to various academic and clinical duties in undergraduate medical students may be a risk factor for subsequent mental morbidity. While association between mental distress and sleep disturbances have been reported in various studies, the causality is not clear and minor psychopathology should be considered as a potential confounding factor for poor sleeping. A potential limitation of this study is that students with sleep problems were less likely to attend lectures when we were collecting data. Another methodological limitation for our study is that cross sectional design is not a good method to exam the direct relationships and further controlled prospective studies is needed.

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