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Impact of Shift Work on General Health Status of Medical Residents.

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Abstract:

Background: Medical residents 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 for medical residents.

Method: a cross sectional study was conducted to explore the association between shift works and general health status of 128 medical residents. A self report sleep-wake questionnaire and general health questionnaire (GHQ) were used to test the pattern of sleep-wake and general health status respectively.

Result: There was a significant correlation between sleep disruption and general health status of study sample ($p=0.001$). number of night shift was a predictor for general health among medical residents.

Conclusion: sleep disruption due to shift work could be a predictor for mental morbidity. Reduce in night time shift among medical residents might prevent both physical and mental morbidity among them.

Background:

From a bio-behavioral aspect human being follows a diurnal model of living activities with sleeping at night and being

awake during the day. The biological clock recognizes night as a time to sleep. Any irregularities in this model causes a psychosomatic tension. Changes in cir-

adian rhythm function due to working at night disrupt the usual function of biological clock which in turn brings about psychological and physical distress. Colquhoun and Rutens Frens believe that not only biologic changes due to shift work but also psychological tension for coping to disrupted sleep pattern could affect both physical and mental health of individuals. In a multidimensional model, psychological distress due to shift work has been attributed to three distinct factors: circadian rhythm, sleep and social factors.⁽¹⁾

Based on current findings; changes in sleep-wake pattern via sleep deprivation and inability to sleep is a potential risk factor for individual overall health. There is some evidence that shift work increases rate of psychosomatic disorders such as cardiovascular, GI and even in female reproduction function.⁽²⁻⁵⁾

Association between shift work and its subsequent sleep deprivation has been replicated in various studies. The result from these studies motivated occupational medicine professional to design regular periodic medical examination for individuals working in a shift work schedule.⁽⁶⁻¹²⁾ And general health status considered as a part of sleep deprivation assessment. Medical residents is a population who would encounter serious changes in their sleep-wake pattern due to shift work, on call duties and huge academic demands. Disruption in sleep wake pattern not only affect general health of medical residents, but also affect their clinical duties as a physicians such as quality of examination and treatment of their patients.⁽¹³⁾

There is some evidence that even mild sleep deprivation could damage general health of medical residents. Most studies examined the effect of sleep deprivation on cognitive and performance of residents in particular immediate to on-call night.^(14, 15) nevertheless other studies noted that mood affected more than cognitive and motor performance. And it is clearly showed that residents' mood state significantly affected due to shift work fatigue.

There is clear evidence that medical doctors experience severe depression symptoms even suicide ideation.⁽¹⁶⁾ In a prospective study it was showed anxiety and depression caused by every four night on call resolved after one night sleep with seven hour sleep. Meanwhile changes in their mood status affect occupational performance.⁽¹⁷⁾ Brown et al in a study on 21 medical residents noted that four hour sleep deprivation causes fatigue and slow motor activity while there was not relationship between sleep deprivation and learning abilities.⁽¹⁷⁾ In contrast, Kievnonet et al. did not detect association between sleep deprivation and mood status of a group of medical residents concluding most people cope with complication of chronic sleep deprivation and enough rest could help residents to adopt adverse effects of sleep deprivation. Shift work and its subsequent sleep deprivation to depressive symptoms could interfere with an empathetic relationship between residents and their patients.^(16, 18-20)

Results from previous studies motivated educational authorities to reduce presence of residents in shift work and other educational and caring programs. Never-

theless, it has not been approved yet. It is not clear if reduces in night work hours could improve general mental health and caring.⁽²¹⁾

Methodology:

Sampling: the study sample was selected from medical residents working in shift work at least over past 6 months. Subjects were excluded if they reported history of current substance use, received hypnotic drugs for other reasons and finally if they were not agree to participate. Instrument was offered when there was greater chance for residents to attend like morning report or general grand round. Sample covered 1/3 of all residents training in each field of medicine in the hospitals affiliated to Shiraz Medical School in Iran

Measures:

In addition to a demographic questionnaire, residents were requested to complete general health questionnaire (GHQ). Data from wake –sleep pattern of participants was gathered using a sleep-wake questionnaire (swq) covering 4 subtype question about the sleep-wake pattern of the individuals. SWQ encompassed 4type question:

1. Average number of shift work per week over the past 3 months
2. Average of time spent in bed during each night shift work.
3. Frequency of awakening during an on-call night
4. Number of refreshing and regular hour of sleep during off-call shift.

Data were analyzed in SPSS version 16.analysis of variance (ANOVA) and t-

test for equality of means was carried out.

Results:

135 residents in the teaching hospitals affiliated to Shiraz University of Medical sciences in Iran participated in the study. Seven subjects were excluded because of history of regular hypnotic and psychotropic use.

the mean ange of age of sample was 30.8(range27-36). In term of sex 74 (57.8%) were male and 54 (42.2%) were female. 48.4% of sample was in year 2 and 27.3% and 24.3% were in years 1 and 3 of residency respectively. 16.4% of sample were recruited from residents in internal medicine followed by residents in pediatric (13.3%), general surgery (10.9%), obstetrics and gynecology(15.6%), psychiatry (5.4%), cardiology (5.4%), etc.

Residents were divided in two groups based on the number of night shift work per week: group 1 included those with two or less shift and group 2 includes those with 3 or more shift in a week. Based on frequent of awakening participant were divided in 3 groups: subjects awaked two times, subjects awaked 3 times and group 3 included individuals who waked more than 4 times during night shift work.

The rate of sleep deprivation was defined by: desired sleep during non shift night-total sleep during night shift. Subjects felled in 3 groups based on their own subjective report:

Group 1: sleep deprivation for 1 to 2 hours.

Group2: sleep deprivation for 3 to 4 hours

Group3: sleep deprivation for more than 4 hours.⁽¹⁷⁾

In comparative analyses residents with two or less night shift work per week had lower GHQ score than those with 3 or more night shift work ($P = .001$). In analyses of variance there was significant statistical differences in mean GHQ score between groups according their level of sleep deprivation. So that residents with more sleep deprivation reported poor general health status than those with less sleep deprivation. ($p = .001$).

Considering the frequency of awakening during the night shift, there was not significant difference in mean of GHQ score between groups ($p = .092$)

Discussion:

The main finding of current study is that shift work could affect general health status of medical residents. This effect is linearly related to number of night shift work and its subsequent sleep deprivation. So that findings from present study showed that resident with three or more shift work potentially experienced poor mental health. In the other word residents with more shift work and its associated sleep deprivation had lower general health status.

Finding from present study is in line with previous studies. Brown and et al. In a study on medical residents and students noted that sleep deprivation for four hours and more causes fatigue and psychomotor retardation.⁽²⁰⁾

Changes in sleep wake pattern leads to both immediate and delayed onset complications. Some studies reported changes in mood and cognitive performance immediately to shift night.^(22, 23) on the other hand in a longitudinal investigation, Chang et al. found depressive symptoms among a group of medical students 24 year after of their graduation.

In contrast to earlier studies, in present study frequency of awakening during the shift night was not associated with general health status of subjects. In Rose et al., study, Increase in number of call during the sleep causes depression and irritability in residents.⁽¹⁴⁾

In conclusion, being awake could not be a potential risk factor for sleep related health problem. But the time of being awake is associated with amount of sleep deprivation might brings about acute and chronic psychosomatic disturbance. The strength of this study a good sample with a logical distribution. A limitation of current study is that it is a cross sectional study and is not able to detect the effect of continuous changes secondary to shift work and its subsequent sleep problems. In addition to that individuals with sleep problem might not present in educative programs starting in the early morning like morning report. In sum further retrospective study controlling other confounding factors is recommended

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