ABSTRACT

**Background:** Stressful life events may lead to insomnia, a very common sleep disorder. **Aim and Objectives:** The aim of the study was to study the correlation of perceived stress levels and sleep quality among physicians during the coronavirus disease-19 Pandemic. **Materials and Methods:** Physicians working in Burdwan Medical College were selected as a study group and age, sex-matched controls were selected from other non-medical workers. This online survey was conducted using Google Forms. The form was shared with participants using emails and WhatsApp. In the first section of the form the importance of the study was explained and informed consent was taken from the participants. In the second part of the form, subjects were asked to fill up demographic details and relevant history; in the third part, participants were asked to fill up two scales: Perceived Stress Scale (PSS) and Pittsburgh Sleep Quality Index (PSQI). **Results:** 128 doctors and 114 other staff participated in the present study. Doctors had significantly higher PSS and PSQI levels as compared to the other group. Doctors’ PSQI: Mean ± SD = 7.59 ± 4.37 and other staff PSQI: Mean ± SD = 5.77 ± 2.75; *P* < 0.0001**. Doctors’ PSS: 18.43 ± 4.04 and other staff PSS: 15.14 ± 1.7; *P* < 0.0001**. PSS and PSQI levels were positively correlated in both groups with *r* values of 0.975 for Doctors and 0.544 for other staff, respectively. **Conclusions:** Doctors were found to have higher PSS and PSQI levels as compared to the control group. PSS levels were found to be positively correlated with PSQI levels and more so among doctors.

**KEY WORDS:** Doctors; Perceived Stress; Insomnia; Pandemic

INTRODUCTION

Stressful life events may lead to insomnia, a very common sleep disorder.[1] Exposure to excessive stress for long periods may activate various defense mechanisms in our body and bring about various pathophysiological changes.

The responses involve the hypothalamus and pituitary glands and lead to changes in neuroendocrine functions. Immune functions may also be altered.[1-3]

Sleep is an essential for maintaining homeostasis and chronic sleep deprivation is an emerging problem of the postmodern society. The stress systems of the body continuously bring about defensive adaptive changes to maintain homeostasis while encountering changing and challenging environment and are affected by sleep loss. If these defenses fail, insomnia may result. Failure of the defense mechanisms to maintain a constancy in milieu interior may result in insomnia.[1-3]
Nearly 60% subjects suffering from insomnia neither report their problems to physicians nor seek help. Hence, in spite of insomnia being considered the most common sleep disorder, it still remains an under-recognized and undertreated problem and prevalence also varies considerably. Inadequate identification of insomniacs, under treatment of insomnia both pose a huge challenge to medical and public health implications as chronic insomnia may decrease work output and also affect the quality of life (QOL).[1-6]

Chronic insomnia can lead to increased sympathetic nervous system activity resulting in increased heart rate, vasoconstriction, and increase in body temperature. Increased skeletal muscles movements before or during sleep have also been observed in different studies.[5,6]

Different studies have observed that health-care professionals as compared to other professional counterparts perceive more stress[7] and higher occupational stress among doctors may lead to insomnia as well as various stress related health issues. A survey in Canada demonstrated that doctors of both genders perceived higher levels of occupational stress.[8] Sixty-eight percent of doctors were found to be overloaded with their work in a study conducted in a teaching hospital of Pakistan.[9] Studies conducted previously also demonstrated that female doctors have lower job satisfaction as compared to their male counterparts.[10] According to report of American Foundation for Suicide Prevention, suicidal death is about 70% more likely among male doctors and 250–400% higher among female doctors as compared to other professional counterparts.[11]

The Coronavirus disease (COVID)-19 pandemic has put human civilization into a huge challenge, especially in the field of medicine. Doctors are working as front-line workers. According to India Medical Association, seven hundred and 66 doctors have lost their lives due to COVID infection during the second wave. Huge workload, inadequate rest, and loss of lives are a few predisposing factors which have added to increased mental pressure among doctors. Thus, the present study was conducted to determine perceived stress levels (using Sheldon Cohen’s scale), Sleep quality (using Pittsburgh Sleep Quality Index [PSQI]) and study their correlation among physicians and compare these indices with selected controls.

MATERIALS AND METHODS

Physicians employed in Burdwan Medical College and Hospital were selected as study group and age, sex-matched controls were selected from other non-medical staff working in the hospital. Institutional ethical clearance was taken from the Institutional ethics committee and informed consent from the subjects was obtained before conduction of the study. The study was conducted in 3 months during the second wave of the present pandemic. Subjects aged more than 30 years were included in the study. Before the age of thirty physicians does not usually join a job, they are busy with their undergraduate and post-graduate training. Their lifestyle is different in that time interval. Hence, doctors above this age group were chosen for the present study.

Inclusion Criteria

Subjects above the age of thirty with permanent service and having education level of minimum graduation were only included.

Exclusion Criteria

(1) Subjects suffering from psychiatric problems.
(2) Subjects on medication that may alter the sleep cycle.
(3) Drug addicts and alcoholics.

Sample size calculation and sampling method:

360 physicians are working in Burdwan Medical College at present who fulfill the above inclusion criteria. The sample size was calculated using an online sample size calculator at Calculator.net (Confidence level 95%; Confidence interval 5%). The sample size calculated was 186.

Procedure

The present online survey was using Google Forms. The form was shared with participants using emails and WhatsApp. Email addresses and WhatsApp numbers were collected from the college records. In the first section of the relevance of the study was explained and informed consent was taken from the participants. In the second part of the form, subjects were asked to fill up demographic details and relevant history; in the third part, participants had to fill up two scales: Perceived Stress Scale (PSS) of Sheldon Cohen and PSQI.

The prevalence of insomnia has been observed to be higher among older individuals as compared to younger counterparts in different studies.[12] Women are more affected by stressors as compared to men.[13] Hence, subjects of the two groups were age- and sex- matched.

Measures

The PSS of sheldon cohen[7]

This is the most widely used psychological instrument for measuring perceived stress scores. This instrument measures how much stressful a person perceives his or her life under prevailing circumstances during the past month. The scale uses several queries about the present levels of experienced stress. It consists ten items. Four of these are reverse-scored. All items are measured on a 5-point scale from 0 to 4. The total score of a subject may vary from 0 to 40.
**PSQI**

PSQI is a 19-item questionnaire which evaluates sleep quality as well as disturbances in the past 1 month. The first 4 items consist of open questions; Items 5–19 are rated on a 4-point Likert scale. Each item scores yield seven components. The total score may vary from 0 to 21 and is obtained by adding the seven component scores. A score of more than five indicates poor sleep quality as per this instrument.

**Statistical Analysis**

Data were checked for normality, outliers, and missing data. Data analysis was done using SPSS version 16, with a 2 tailed $\alpha$ level of 5%. $t$-test was used to compare PSS and PSQI levels of the two groups.

**RESULTS**

This cross-sectional study was carried during the second wave of the present pandemic in 3 months. This online survey was conducted using Google Forms. 140 doctors and 121 other staff had responded in the survey, but all could not be included as per exclusion criteria. 128 doctors and 114 other staff participated in the present study. Perceived stress levels were assessed using Sheldon Cohen Scale and PSQI levels were calculated using PSQI. The subjects were age and gender-matched (Doctors: 72.7% were males; 27.3% were females versus Other staff: 71.9% were males and 28.1% were females). Age distribution of both groups was as follows: Doctors-48.7% Age Group 30–40; Age Group 41–50: 22.8%; Age Group: 51–60: 24.6%; Age Group: 61 and above: 3.5%. Other staff-50% Age Group 30–40; Age Group 41–50: 21.9%; Age Group: 51–60: 25%; Age Group: 61; and above: 3.1%). Doctors had significantly higher PSS and PSQI levels as compared to the other group [Figures 1 and 2]. Doctors’ PSQI: Mean ± SD = 7.59 ± 4.37 and other staff PSQI: Mean ± SD = 5.77 ± 2.75; $P$ < 0.0001**. Doctors’ PSS: 18.43 ± 4.04 and other staff PSS: 15.14 ± 1.7; $P$ < 0.0001**. PSS and PSQI levels were positively correlated in both groups with r values of 0.975 for doctors and 0.544 for other staff, respectively [Figures 3 and 4].

**DISCUSSION**

This cross-sectional pilot study was conducted online in a teaching hospital of eastern India during the present Pandemic (second wave). Doctors were found to have higher perceived stress scores and PSQI levels as compared to the controls. The
average PSQI level of doctors was 7.59. Scores measured by this instrument with values greater than 5 indicate poor sleep quality. The findings of the present study observed poor sleep quality among doctors. Perceived stress levels were found to be positively correlated with PSQI levels and more so among doctors with r values of 0.975 for Doctors and 0.544 for other staff, respectively. PSQI was developed in 1989. This instrument provides reliable and standardized measure of sleep quality and discriminated between “good” and “poor” sleepers. It also evaluates a range of sleep disturbances which affect sleep quality.[3] In the present study, we have also used PSQI to assess sleep quality.

Burdwan Medical College caters to a huge load of patients from five districts. Hence, there is always a huge patient load and doctors of many clinical specialties are overburdened with their work. Due to the high infectivity of the present pandemic, treatment has posed a huge challenge to doctors in this busy government hospital. In medical colleges, doctors also take part in medical education. This COVID-19 pandemic has also forced them to continue medical education online and many are not very technology-friendly. The sudden conversion of medical education to an online mode is also adding a lot of stress on medical educators.[14] We had conducted a study previously on healthcare professionals[7] and found that they perceived more stress as compared to non-medical counterparts and this is similar to findings of many previous studies.[14-16]

Basta et al.[1] suggested that various physiological as well as psychological factors may be responsible for development of short term and chronic insomnia. Subjects having anxious personality traits and facing severe stressful life events are more likely to develop insomnia. Ageing and menopause are two physiological states of life which may alter the sleep homeostasis due to various neuro endocinial changes taking place in the body. Hence, during treatment of insomnia a doctor needs to look into multiple aspects.

Han et al.[2] conducted a study to review potential mechanisms that may bring changes in the sleep wakefulness cycle. A thorough review of literature was conducted. The activity of the hypothalamus, pituitary, and adrenal glands, which are the main parts of the neuroendocrine system which are essentially active, were studied to assess relationship of stress and insomnia. In the present study correlation perceived stress and quality of sleep was assessed.

Sahimi et al. conducted a study to assess the factors that influence health anxiety among healthcare workers (HCW) during the present pandemic. An online survey was conducted on seven hundred and nine HCW. Results showed that subjects who perceived higher risk for COVID-19 and had higher cautious attitude towards COVID-19 also had higher levels of Health Anxiety Inventory scores.[17]

We had conducted a study during the first wave of the pandemic to study PSS, burnout, and job satisfaction of physicians and non-medical counterparts. Doctors, as well as non-medical staff, had high PSS levels with no difference between the two groups, and all were mostly satisfied with their jobs and burnout scores were not at all alarming.[19] In the present study, doctors had significantly higher PSS and PSQI scores as compared to the other group.

A study was conducted by Kakodkar et al.[19] to assess the fear of the present pandemic and its impact on the QOL of the subjects during the Lockdown period. The study was carried among 198 teaching faculty in a teaching hospital. The fear scale of COVID-19 and QOL-BREF Qol was the two assessment tools used. The study concluded that there was certainly a fear about COVID-19, but it had not impacted the QOL. This study was also conducted during the first wave of the present pandemic. We conducted the present study during the second wave.

In the present cross-sectional study, we have observed that doctors had higher stress scores as compared to controls and this may have negatively affected their quality of sleep.

A study was conducted by Panda et al.[20] to determine the level of the psychological impact of the COVID-19 pandemic on young adults. The online survey was conducted using Impact of Event Scale-Revised and Depression, Anxiety, and Stress Scale. The researchers observed high levels of depression as well as anxiety among the study population with female preponderance. Our subjects in both groups were age and gender-matched and we also observed higher levels of stress in both groups.

Strengths and Limitations

The present study was carried during the second wave of the present pandemic and nearly eight hundred Indian doctors have already lost their lives from COVID infection during this period. To formulate strategies to improve the mental status of doctors it is of utmost importance to know their mental health issues which make this study very relevant in the present scenario. The present study was only conducted in a teaching hospital in an urban setting and no follow-up was done. PSQI does not address a specific night objectively but it summarizes sleep quality over a month. These factors do add limitations to the present study.

CONCLUSIONS

Doctors were found to have higher PSS and PSQI levels as compared to the control group. PSS levels were found to be positively correlated with PSQI levels and more so among doctors.
REFERENCES


