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RESEARCH ARTICLE

ASSOCIATION OF SLEEP PROBLEMS AND COMMON MENTAL HEALTH PROBLEMS IN ENGINEERING STUDENTS OF SGT UNIVERSITY, GURUGRAM, INDIA

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Abstract

Introduction: Sleep is naturally recurring state of mind and body, characterized by altered consciousness, inhibition of nearly all voluntary muscles and reduced interactions with surroundings. Chronic disturbances can lead to poor sleep quality which may manifest as increased irritability, anxiety, tension, depression, confusion. The undergraduate years are a period of vulnerability when considering sleep problems and mental health may tend to worsen over time. Alcohol, tobacco, and stimulant beverages such as tea/ caffeine affect the quality of sleep. Students are more prone to adopt and practice maladaptive sleep hygiene such as irregular bedtime, academic pressure, internet addiction, electronic media exposure, alcohol consumption and smoking, which affects quality of sleep.

Material and Methods: The study was a cross sectional, interview based, non-interventional studyconducted on the engineering students at SGT University, Budhera, Gurgaon, Haryana, India. Data was collected through questionnaires such as Pittsburgh Sleep Quality Index, The Epworth `Sleepiness Scale, Depression Anxiety Stress Scale, The general health questionnaire.

Results:A total of 274 students were included in the study. The mean age was20.11 ± 1.30 years and there were more male (77.3%) students as compared to females (22.7%). Alcohol use was present in 43(11.7%) of students, cannabis intake was present in 11(4%), nicotine intake was reported by 39(14.2%) of students and only one student reported of taking opioid. DASS-A, DASS-S, DASS-D, GHQ-12, PSQI were positively correlated with each other when associations were studied individually.

Conclusion: In our study,it was established that poor sleep quality in engineering students was significantly associated with poor mental and physical health.

Introduction:-

Sleep is naturally recurring state of mind and body, characterized by altered consciousness, relatively inhibited sensory activity, inhibition of nearly all voluntary muscles and reduced interactions with surroundings.Sleep occurs in repeating periods, in which the body alternates between two distinct modes: REM sleep and non-REM sleep.[1]

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During sleep, most of the body's systems are in an anabolic state, helping to restore the immune, nervous, skeletal and muscular systems. These are vital processes that maintain mood, memory, cognitive function and play a major role in the function of the endocrine and immune systems.[2]

Now a days, reduced sleep duration and quality are considered to be endemic in modern society.As sleep is adaptive in nature, it is easily altered or even disturbed.The advent of artificial light has substantially altered sleep timing in industrialized countries. [3]

Occasional disturbances in sleep can occur in normal life, but chronic disturbance leads to poor sleep quality which is associated with physical illnesses like cardio vascular disease, hypertension, glucose impairment, metabolic syndromes, endocrine disorders, immunological disorders and psychological health problems like psychosocial distress manifesting as increased irritability, anxiety, tension, depression, confusion are reported.[4]

Sleep deprivation is also related to impaired wellbeing, fatigue, daytime sleepiness, daytime dysfunction at individual level. It also increases risk for occupational injuries, somatic and psychiatric disorders, and work disability.[5]

Good sleep is unbroken, uneventful, has short latency and has no awakening throughout. Most important aspect of sleep health is the quality of sleep. Changes in habits and modern society practices are the cause of deviation in natural sleep pattern.[6]

The extent to which sleep disorders are associated with impairment of health-related quality of life (HRQoL) is poorly described in the developing worldwhere socioeconomic and political changes and accelerating trends towards urbanization may be associated with an increased risk of poor health, social instability, and sleep problems.[7]

The undergraduate years are a period of vulnerability when considering sleep problems and mental health. Sleep problems tend to worsen over time in undergraduate students, a finding which is concerning as even the time-limited experience of significant sleep problems is associated with reduced mental health outcomes.Poor sleep quality in students is associated with error in judgement, poor concentration, bad mood and poor cognition the next day. Poor sleep health adversely affects general health, wellbeing and quality of life.[3]

India is a country of youth, and lifestyle changes are at a very fast pace since past few decades.[3]These changes in habits and behaviours related to sleep are causing changes in pattern of sleep and affecting the health of college students. Alcohol, tobacco and stimulant beverages such as tea/ caffeine affect the quality of sleep. Undergraduate college students are more prone to adopt and practice maladaptive sleep hygiene such as irregular bedtime, academic pressure, internet addiction, electronic media exposure, alcohol consumption and smoking, which affects quality of sleep.[9]

Methods and Material:-

The study was conducted on the engineering students of SGT University, Budhera, Gurgaon, Haryana, India. It was a cross sectional, interview based, non-interventional study. After explaining the students about the research 300 students gave the written consent and filled the questionnaires. Inclusion and exclusion criteria were applied to this sample following which 26 students were excluded because of it.

Total No. Of Students(300)
Exclusion Criteria
H/O Physical Illness 21
H/O Psychiatric Illness 3
Age less than 18 years 2
B.Tech (274)

Diagnostic measures:

1. Pittsburgh Sleep Quality Indexis an effective instrument used to measure quality and patterns of sleep in adults. It is a self-report questionnaire that assesses sleep quality over a one month time interval. The measure consists of 19 individual items, creating seven components that produce one global score and takes five to ten minutes to complete. Scoring is based on a 0–3 Likert scale, where a score of 3 reflects the negative extreme. The internal consistency of the PSQI, estimated by Cronbach's alpha, is .73[31]

2. The Epworth Sleepiness Scale is a questionnaire used to identify excessive sleepiness associated with accumulated sleep debt or clinical sleep disorders. The ESS assesses retrospectively the probability to fall asleep in eight everyday situations by means of a scale ranged from 0 (=never fall asleep) to 3 (=high probability to fall asleep). Internal consistency for the ESS, estimated by Cronbach's alpha, is .75.[23]
3. Depression Anxiety Stress Scale is made up of 21 self-report items to be completed over 5-10 minutes each reflecting a negative emotional symptom.[21] The scores ranged from 0 meaning that the client believed the item "Did not apply to them at all" to 3 meaning that the client considered the item "Apply to them most of the time". The reliability scores of the scales in terms of Cronbach's Alpha rate the depression scales at 0.91, the anxiety scale at 0.84 and stress scale at 0.90.[23]
4. The general health questionnaire is used to detect psychiatric disorder in general health population and within community. It assesses the respondent's current state and ask if that differs from his/her usual state.[24]There are various versions with 12, 28, 30 and 60 questions. Cronbach's Alpha for GHQ 12 is 0.78.[25-6]

Statistical Analysis:

Data were coded and recorded in MS Excel spreadsheet program. SPSS v23 (IBM Corp.) was used for data analysis. Descriptive statistics were elaborated in the form of means/standard deviations and medians/IQRs for continuous variables, and frequencies and percentages for categorical variables. Data were presented in a graphical manner wherever appropriate for data visualization plots/column charts for continuous data and bar charts/pie charts for categorical data. Group comparisons for continuously distributed data were made using independent sample't' test when comparing two groups. If data were found to be non-normally distributed, appropriate non-parametric tests in the form of Wilcoxon Test were used. Chi-squared test was used for group comparisons for categorical data. In case the expected frequency in the contingency tables was found to be <5 for >25% of the cells, Fisher's Exact test was used instead. Linear correlation between two continuous variables was explored using Pearson's correlation (if the data were normally distributed) and Spearman's correlation (for non-normally distributed data). Statistical significance was kept at $p < 0.05$

Results:-

Table 1:- Sociodemographic details**.**

Parameters	**(N = 274) n (%)**
Age (Years)* **	20.11 ± 1.30
Gender* **	
Male	211 (77.3%)
Female	62 (22.7%)
Marital Status (Unmarried)	274 (100.0%)
Residence* **	
Rural	130 (47.4%)
Urban	144 (52.6%)
F/H/o Sleep Disorder (Present)* **	15 (5.5%)
Details of F/H/o Sleep Disorder* **	
None	260 (94.9%)
Insomnia	11 (4.0%)
Obstructive Sleep Apnoea	3 (1.1%)
Parasomnia	0 (0.0%)
Irregular Sleep Pattern	0 (0.0%)
Alcohol Use (Present)* **	43 (15.7%)
Frequency of Alcohol Intake* **	
Once Or Twice	17 (51.5%)
Weekly	4 (12.1%)
Monthly	9 (27.3%)
Daily Or Almost Daily	3 (9.1%)
Alcohol Intake (mL)	317.88 ± 254.86
Cannabis Use (Present)	11 (4.0%)

Frequency of Cannabis Use* **	
Once Or Twice	5 (62.5%)
Monthly	0 (0.0%)
Weekly	0 (0.0%)
Daily Or Almost Daily	3 (37.5%)
Opioid Use (Present)	1 (0.4%)
Frequency of Opioid Use	
Weekly	0 (0.0%)
Daily Or Almost Daily	1 (100.0%)
Benzodiazepine Use (Present)	0 (0.0%)
Nicotine Use (Present)* **	39 (14.2%)
Frequency of Nicotine Use* **	
Once Or Twice	61 (69.3%)
Monthly	4 (4.5%)
Weekly	2 (2.3%)
Daily Or Almost Daily	21 (23.9%)

Table no 1 depicts sociodemographic details of the study which included n=274 after applying exclusion criteria to 26 students. The mean age was 20.11 ± 1.30 and there were more male (77.3%) students as compared to females (22.7%). All of them were unmarried, 130(47.4%) were living in rural area and 144(52.6%) were living in urban area. 14 of the students had family history of sleep problems, out of them 11(4.0%) reported to have insomnia and 3 reported obstructed sleep apnoea (1.1%). Alcohol use was present in 43(11.7%) of students, cannabis intake was present in 11(4%), only one student reported of taking opioid, none of them was taking benzodiazepines and nicotine intake was reported by 39(14.2%) of students.

Table no 2:-Association between all scales and parameters.

Parameters	DASS-D Score	p value	DASS-S Score	p value	DASS-A Score	p value	GHQ Score	p value	ESS Score	p value	PSQI Score	p value
Age (Years)	Correlation Coefficient (rho) = -0.06	0.340[1]	Correlation Coefficient (rho) = -0.01	0.854[1]	Correlation Coefficient (rho) = -0.03	0.656[1]	Correlation Coefficient (rho) = 0.25	**<0.001**	Correlation Coefficient (rho) = -0.01	0.806[1]	Correlation Coefficient (rho) = 0.05	0.406[1]
Gender		0.342[3]		0.029[3]		0.612[3]		**<0.001[3]**		0.544[3]		0.580[3]
Male	9.91 ± 8.54		11.28 ± 8.48		9.90 ± 7.60		8.83 ± 7.19		7.34 ± 3.99		5.98 ± 4.05	
Female	11.89 ± 10.40		14.56 ± 10.21		11.02 ± 9.12		16.95 ± 7.86		8.00 ± 4.64		6.05 ± 3.45	
Marital Status (Unmarried)	10.34 ± 9	-	12 ± 8.99	-	10.13 ± 7.96	-	10.62 ± 8.08	-	7.47 ± 4.15	-	5.97 ± 3.92	-
Residence		0.513[3]		0.816[3]		0.492[3]		**0.004[3]**		0.172[3]		0.806[3]
Rural	10.05 ± 8.96		11.79 ± 8.56		9.75 ± 7.72		12.17 ± 8.44		7.80 ± 3.90		5.93 ± 3.84	
Urban	10.60 ± 9.07		12.19 ± 9.39		10.47 ± 8.18		9.23 ± 7.51		7.17 ± 4.36		6.01 ± 4.00	
Alcohol Use		0.662[3]		0.944[3]		0.675[3]		0.580[3]		0.768[3]		0.982[3]
Present	11.23 ± 10.15		12.56 ± 10.46		9.74 ± 8.17		11.33 ± 8.42		7.23 ± 4.03		5.70 ± 3.26	
Absent	10.17 ± 8.79		11.90 ± 8.71		10.20 ± 7.94		10.49 ± 8.03		7.51 ± 4.18		6.02 ± 4.04	
Cannabis Use		0.754[3]		0.950[3]		0.244[3]		0.915[3]		0.134[3]		0.984[3]
Present	10.45 ± 7.97		11.45 ± 8.77		7.36 ± 7.02		10.18 ± 7.90		5.73 ± 2.53		6.09 ± 4.72	
Absent	10.33 ± 9.06		12.02 ± 9.01		10.25 ± 7.99		10.64 ± 8.11		7.54 ± 4.20		5.97 ± 3.89	
Opioid Use		0.612[3]		0.128[3]		0.128[3]		0.338[3]		0.232[3]		0.874[3]
Present	12.00 ± 0		0.00 ± 0		0.00 ± 0		17.00 ± 0		3.00 ± 0		5.00 ± 0	
Absent	10.33 ± 9.02		12.04 ± 8.97		10.17 ± 7.95		10.60 ± 8.09		7.49 ± 4.15		5.97 ± 3.93	
Nicotine Use		0.601[3]		0.722[3]		0.999[3]		0.609[3]		0.676[3]		0.611[3]
Present	10.90 ± 11.54		12.28 ± 11.14		10.49 ± 9.03		9.90 ± 7.83		7.34 ± 4.28		6.38 ± 4.50	
Absent	10.25 ± 8.54		11.95 ± 8.60		10.07 ± 7.79		10.74 ± 8.13		7.49 ± 4.14		5.90 ± 3.82	
PSQI Score**	Correlation	**<0.001[1]**	Correlation	**<0.001[1]**	Correlation	<0.001[1]	Correlation	**<0.001[1]**	Correlation	**<0.001[1]**		**<0.001[3]**

*	Coeffi cient (rho) = 0.3		Coeffi cient (rho) = 0.38		Coeffi cient (rho) = 0.39		Coeffi cient (rho) = 0.33		Coeffi cient (rho) = 0.29			
ESS Score* **	Correl ation Coeffi cient (rho) = 0.25	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.37	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.38	<0.001[1]	Correl ation Coeffi cient (rho) = 0.26	**<0.001[1]**		**<0.001[3]**		**<0.001[3]**
DASS-A Score* **	Correl ation Coeffi cient (rho) = 0.65	**<0.001[1]**	26.63 ± 7.21		20.11 ± 7.47		20.26 ± 6.40		Correl ation Coeffi cient (rho) = 0.38	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.39	**<0.001[1]**
DASS-S Score* **	Correl ation Coeffi cient (rho) = 0.68	**<0.001[1]**	22.97 ± 7.58		Correl ation Coeffi cient (rho) = 0.74	<0.001[1]	15.90 ± 7.32		Correl ation Coeffi cient (rho) = 0.37	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.38	**<0.001[1]**
GHQ Score* **	Correl ation Coeffi cient (rho) = 0.41	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.39	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.34	<0.001[1]	12.00 ± 9.06		Correl ation Coeffi cient (rho) = 0.26	**<0.001[1]**	Correl ation Coeffi cient (rho) = 0.33	**<0.001[1]**

Table no 2 depicts that scores of DASS-A, DASS-S, DASS-D, GHQ-12, PSQI were positively correlated with each other when associations were studied individually.

Discussion:-

In our study, age ranged from 18-25 years with the mean age being20.11 ± 1.30 years with more male prevalence (77.3%) as compared to females (22.7%). Reason for this could be that in India, females still hesitate to take engineering as their career.

In our study PSQI score was positively significant with DASS-Sscores implying that stress was more in students who had poor sleep quality. This finding was similar with the findings of cross-sectional study which was conducted from April to May 2016 at the College of Medicine at King Saud bin Abdulaziz University for Health Sciences in Riyadh, Saudi Arabia. A high prevalence of poor sleep quality (76%) and stress (53%) was found, and there was a statistically significant association ($p < 0.001$) between the two. Logistic regression indicated that students who were not suffering from stress are less likely to have poor sleep quality, and the risk of having poor sleep quality is almost four times higher in students whose cumulative grade point average (GPA) is less than 4.25.[23]

In our study PSQI scores were significant with DASS-A, DASS-S, DASS-D scores implying that poor sleep quality is associated with an overall poor mental health. Similar finding was reported in another study which was conducted on seventy-one students of a large public university after having been recruited through the undergraduate participant pool or through advertisements placed on campus. Although participants did not report clinically concerning mental health issues as a group, global sleep quality was associated with mental health.[24]

Based on a cross-sectional survey of 2495 full-time final year university students in China, it was found that there was a strong association between sleep quality and psychological well-being. Having normal sleep quality is associated with lower level of psychological well-being problems.[25]

In a cross-sectionalstudy involving first year students of medical, engineering, arts & commerce colleges was undertaken. Percentage of psychiatric cases was 17.07%, significantly more in male students and those in medical and engineering colleges.[28]

In our study PSQI was significantly associated with GHQ scores implying that poor sleep quality is associated with poor physical health. Similar finding was reported in astudy which was done onstudents at MIT and Brigham and Women's hospital, which measured over 100,000 hours of multi-sensor and smartphone use data from 168 college students, recruited together with their social groups. It was found that sleep irregularity was statistically significantly associated with bad health.[26]

In our study 15.7% student reported alcohol use, 14.3 % reported nicotine intake and 4% were using cannabis. Another cross-sectional study, descriptive in nature was conducted in two engineering colleges. Ever use of tobacco product was found to be 66.0% and 22.0%, of alcoholic beverages: 72.0% and 26.0%, of cannabis: 46.0% and 14.0%for students of government and private engineering college respectively. High level of substance abuse was found to be present among male engineering students staying at hostels.[27]

Conclusion:-

In our study,it was established that poor sleep quality in engineering students was significantly associated with poor mental and physical health.

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