

ORIGINAL ARTICLE



Assessment of Sleep Quality and Stress Level in Bus Drivers in and around Chennai City – A Cross Sectional Study

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The city bus drivers are more prone to various physical and mental stress due to the heavy traffic in the city. They are also on shift work causing decrease in the sleep quality which results in increase in stress level and negatively impacts on the health and quality of life.

Objective: To assess the stress level among bus drivers in and around city of Chennai Methods: A Cross-sectional study was conducted on a group of 100 city bus drivers from January 2019 to March 2019. The "Perceived Stress Scale (PSS)" questionnaire was used to measure stress level. The Pittsburgh Sleep Quality Index (PSQI) was used to measure of sleep quality.

Results: The PSQI scores were poor in 89% of the studied population. The mean PSQI scores were 10.05 and standard deviation of 3.016. Scores of the Perceived Stress Scale shows that 23 % had low stress, 28 % had moderate stress and 49 % had high stress levels. The study shows significant association between stress levels and poor sleep quality.

Conclusion: The result of the study show that the bus drivers in the city are stressed and the stress is high during middle age.

Key words: Perceived Stress Scale (PSS), Pittsburgh Sleep Quality Index (PSQI)

The city bus drivers are more prone to various physical and mental stress due to the heavy traffic in the city. This stress gives many physical, mental and behavioral issues (Kompier, Di Martino, 1995). There are several adverse psychophysical effects due to driving bus, in which the most common is hypertension (Johansson *et al.*, 2012). This stress level also makes the bus drivers more susceptible to the usage of alcohol, tobacco, illegal drugs and over the counter medicines (Ragland *et al.*, 2000).

Occupational stress makes people dread going to work every morning and then make them worry at night. Occupational stress has become more globalized and affects all workers irrespective of the job profile or category. The high amount of stress in the working environment leads to these risky habits which brings further health complications (Azagba & Sharaf, 2011).

The bus drivers because of their seating positions and the ergonomics of the seat have an increased risk of getting musculoskeletal disorders which causes serious health problems, physical and mental stress which may increase the risk of cardiovascular illness in comparison to the other professional groups (Tse *et al.*, 2006).

Shift-work is very common among the bus drivers and they do not get proper sleep due to several trips throughout the day and night which makes them susceptible to problems like irritability, daytime sleepiness and insomnia, resulting in the further increase in stress level and people who are stressed end up eating more, indulge in smoking and drinking. This affects their sleep-wake cycle and quality of sleep, negatively impacting on their health and quality of life (Hauri, 1982). The lack of sleep causes mental fatigue which in turn results in loss of attention and eventually more number of accidents (Florez-Lozano, 1980). Stress at work place is also carried home which creates problems in their household as well where they expect to find peace. (Sagar *et al.*, 2013).

Hence this study was taken up to assess the sleep quality and stress level and to find its association among bus drivers in and around the city of Chennai.

MATERIALS AND METHODS

Study design

A Cross-sectional study was conducted on a group of 100 city bus drivers who are professionally active from January 2019 to March 2019, after obtaining ethical approval from the Institutional Ethics Board, Saveetha Medical College and Hospital. Prior written informed consent was obtained from all the participants. Data collection was done using the Perceived Stress Scale (PSS) which is a questionnaire widely used to measure stress level, validated by Sheldon Cohen *et al.* (1983) and by the Pittsburgh Sleep Quality Index (PSQI).

The Perceived Stress Scale (PSS) is a classic stress assessment tool developed in 1983 and remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about feelings and thoughts during the last month. The participants will be asked to indicate how often they felt or thought a certain way.

Individual scores on the PSS ranges from 0 to 40, higher scores indicate higher perceived stress. PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing all items. Scores ranging from 0-13 would be considered as low stress. Scores ranging from 14-26 would be considered as moderate stress. Scores ranging from 27-40 would be considered as high perceived stress.

The Pittsburgh Sleep Quality Index (PSQI) developed by Buysse and colleagues to provide a standardized measure of sleep quality is based on eighteen self-reported questions; measuring: subjective sleep quality, sleep latency, habitual sleep efficiency, sleeping medication usage, sleep duration, sleep disturbances, and daytime dysfunction. The score from each category is added to get a global score ranging from 0-21. A cut-off score of 5 or above is indicative of a sleep disturbance.

It contained responses ranging from 0 to 4 for each question. Each response corresponds to various feelings and thoughts as indicated below.

Statistical Analysis

Then the data was entered in database Statistical Package for the Social Sciences (SPSS) software version 21. Statistical analysis of the data was done using Data analysis was done using Fisher's exact test and P-value < 0.05 was considered as significant.

RESULTS

The study was conducted among bus drivers in and around city of Chennai using PSQI and Perceived Stress Scale and the results are tabulated below.

Sleep quality assessment (PQSI)

Table 1 shows that the Subjective sleep quality was bad in 29%, the Sleep latency was more than 31 min in 29%, sleep duration was less than 6hrs in 50% and the habitual sleep efficiency was less than 84% in 81%.

Table 3 shows the PSQI scores which were poor in 89% of the studied population. The mean PSQI scores were 10.05 and standard deviation of 3.016

Table 4 shows association between subjective characteristics like Sleep disturbances, Hours of sleep and quality of sleep and the P value was found to be <0.05.

Stress scores:

Scores of the Perceived Stress Scale:

Scores ranging from 0-13 – 23 %

Scores ranging from 14-26 - 28 %

Scores ranging from 27-40 - 49 %

Table 5 shows the association between PSQI and Perceived Stress Scale scores and the P value was found to be <0.05.

Table 1. Distribution of Study Participants Based On Their Subjective Sleep Patterns (N=100)

Characteristics	Categories	Frequency (n=100)	Percent (%)
Subjective sleep quality	Very good	13	13
	Fairly good	48	48
	Fairly bad	10	10
	Very bad	29	29
Sleep latency	< 15 mins	25	25
	16- 30 mins	46	46
	31- 60 mins	8	8
	> 60 mins	21	21
Sleep duration (hours)	>7	12	12
	6-7	38	38
	5-6	12	12
	<5	38	38
Habitual sleep efficiency (score)	>85%	19	19
	75- 84%	20	20
	65- 74%	18	18
	<65%	43	43

Table 2. Subjective Sleep Disturbances Experienced By the Participants in the Past Week (n=100)

Sleep disturbances	Number (n=100)	Percent (%)
Waking in the middle of the night	54	54
Getting up to use the wash room	42	42
Due to breathing difficulty	11	11
Cough or snoring	28	28
Feeling too cold	9	9
Feeling too hot	6	6
Having bad dreams	38	38
Feeling pain	4	4
Other reasons	20	20

Use of medications	7	7
Trouble staying awake at work	53	53
Reduced enthusiasm at work	57	57

Table 3. Sleep Quality (PSQI scores)

Sleep quality	Number	Percent
Good	11	11
Poor	89	89
Total	100	100%

Table 4. Association between subjective characteristics and quality of sleep

Characteristics	Categories	Quality of sleep			Fisher's exact test	P value
		Good	Poor	Total		
Sleep disturbances	No disturbances	3	0	3	16.25	<0.05
	Mild	7	43	50		
	Moderate	1	36	37		
	Severe	0	10	10		
	Total	11	89	100		
Hours of sleep	> 7	5	7	12	12.11	<0.05
	6-7	5	33	38		
	5-6	0	12	12		
	<5	1	37	38		
	Total	11	89	100		

Table 5. Test of significance (p value) between PSQI AND PSS

Sleep quality	High stress	Moderate Stress	Low Stress	P value
Good	0	3	8	<0.05
Poor	49	25	15	

DISCUSSION

The study was conducted among bus drivers in and around city of Chennai using PSQI and Perceived Stress Scale. This study revealed that the Subjective sleep quality was bad in 29%, the Sleep latency was more than 31min in 29%, sleep duration was less than 6hrs in 50% and the habitual sleep efficiency was less than 84% in 81%. The PSQI scores were poor in 89% of the studied population. The mean PSQI scores were 10.05 and standard deviation of 3.016. The study shows significant association between subjective characteristics like Sleep disturbances, Hours of sleep

and quality of sleep (<0.05). Scores of the Perceived Stress Scale shows that 23 % had low stress, 28 % had moderate stress and 49 % had high stress levels. The study also shows significant association between stress levels and poor sleep quality.

Fundamentally the results of this study ties well with the study by Yamada et al. (2008). The study showed that the bus drivers don't spend sufficient time with family due to their hectic job which affects their psychosocial behaviour and contributes largely to the stress and lead to consumption of alcohol and tobacco which hamper their sense during driving causing accidents.

The results of our study support the study by Duffy & McGoldrick (1990). The study was conducted among 376 male bus drivers in a major UK city to identify stress using a questionnaire survey. The bus drivers demonstrated lower job satisfaction and unfavourable scores on mental- health indices compared to normative samples.

Gangwisch *et al.* (2007) studied the effect that sleep duration had on the risk factors for diabetes. There was a noted increase in the risk for diabetes for the subjects who slept < 5 or > 9 hours per night.

Stamatakis and Brown (2008) examined the correlation between sleep duration and obesity-related risk factors and found that the subjects that had short sleep duration had more risk factors for obesity. Also in a study by Baker & Driver (2008) it was found that sleep disturbances in nurses exposed them to physical, emotional, mental and social stress. Sleep changes in women affects the different phases of the menstrual cycle, Pregnancy, postpartum recovery and menopause.

Tse *et al.* (2006) in their research demonstrated that stressors result in physical (cardiovascular disease, musculoskeletal problems, gastrointestinal disorders, fatigue), psychological (anxiety, depression, post-traumatic stress disorder) and behavioural outcomes (substance abuse). Bus driver health problems lead to consequences like employee absence, labour turnover and accidents.

Additionally, researchers at the National Institute of Health have reported that decreased sleeping may lead to a decrease in total lifespan (National Institute of Neurological Disorders and Stroke, 2017). In a study by Labyak *et al.* (2002) in nurses, it was found that poor sleep quality tends to increase rates of cancer, cardiovascular diseases, digestive diseases and irregular menstrual cycles.

CONCLUSION

The result of the study shows that the bus drivers in the city are stressed irrespective of age. The stress level can be improved with the care of the Government by making the PayScale of bus drivers sufficient and satisfactory and the drivers should be provided appropriate holidays whenever needed. Also, performance appraisal schemes have to be devised and

sufficient medical care and assistance should be provided to them. Support should be given by the public by following the traffic rules. It is essential that traffic rules must be introduced at a younger age in school.

In the present study, the PSS score was calculated for positive questions only. More elaborate study can be made considering all the questions for the PSS score.

LIMITATIONS OF THE STUDY:

The sample size is less so, Similar study can be repeated in other intensive care units and by increasing the size of the sample. only the bus drivers from state government (CMBT) and private depot were considered; no female bus drivers could be included due to unavailability during my research.

ETHICAL CLEARANCE

Ethical approval was obtained from the Research Ethics Board, RIMS, Imphal before the beginning of the study.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interests.

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