



# Assessment of Quality of Sleep among Urban Working Women Using Pittsburgh Sleep Quality Index

Sathvik N Rai<sup>1</sup>, Mayur S Sherkhane<sup>2</sup>

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## Author's Affiliation:

<sup>1</sup>Postgraduate; <sup>2</sup>Professor and Head, Dept of Community Medicine, SDM College of Medical Sciences and Hospital, Dharwad

## Correspondence

Dr. Mayur S Sherkhane  
drmayurss@gmail.com

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## ABSTRACT

**Introduction:** Sleep disorder is a common and complicated health problem, which cause morbidity, mortality, decreasing functional capacity and quality of life. Working women are at increased risk for developing sleep disorders due to work-life imbalance added with family responsibilities. The study was conducted to assess the quality of sleep and factors affecting it among working women using Pittsburgh Sleep Quality Index (PSQI).

**Methodology:** Community based cross sectional study was conducted among 234 working women aged 18 years and above. Data was collected and PSQI was used to assess quality of sleep.

**Results:** 41.5% working women were in the age-group of 30-39 years, 53.4% belonging to Class I SES, 83.3% married and 85.9% working between 4-8 hours. Poor sleep quality was seen in 72.6% working women with mean PSQI score of 5.24 (SD  $\pm$  1.408). 90.6% married women had poor sleep quality compared to 35.9% unmarried, who had normal sleep [ $\chi^2=23.55$ , df=1,  $p<0.0001$ ]. 92.4% women with poor sleep quality worked for  $\leq 8$  hours per day as compared to 7.6% who worked for  $>8$  hours [ $\chi^2=6.007$ , df=1,  $p=0.0143$ ].

**Conclusions:** PSQI can be used as a screening tool for early diagnosis. Counselling and health education sessions can be initiated at the earliest at work place.

**Key-words:** PSQI, Quality, Sleep, Urban, Working, Women.

## INTRODUCTION

Sleep plays a vital role in maintaining the equilibrium of human psychosocial behaviour and sleep-wake cycle forms one of the essential biological rhythms.<sup>1</sup> Sleep is a cardinal part of the physiological processes in humans which contributes to health and general well-being of the individuals. Well-being is associated with positive emotions, recall of more positive episodes, optimism, and lower feelings of anxiety, negativity, and depression.<sup>2</sup> One of the important aspects of sleep is the quality of sleep, which includes quantitative aspects of sleep, such as its duration, latency or number of arousals, as well as subjective aspects like depth or restfulness of sleep.<sup>3</sup>

Sleep disorder is a common and complicated health problem resulting in increased morbidity, mortality and decrease in functional capacity and quality of life (QOL).<sup>4</sup> Poor sleep quality has become a common problem in today's generation because of deviation in natural sleep pattern, which is mainly due to changing habits and practices related to sleep in modern society.<sup>5</sup> Factors such as socio-demographic and co-morbid health factors, psychosocial stress and lifestyle are also associated with quality of sleep.<sup>6</sup>

Indian families are undergoing rapid and drastic changes due to the increased pace of urbanization and modernization. Indian women belonging to all classes have now entered into paid occupations. At

the present time, Indian women's exposure to educational opportunities is substantially higher than it was some decades ago, especially in the urban setting.<sup>7</sup> With increasing female education and more liberty for their rights and privileges, women's attitude towards their stereotyped role is changing.<sup>8</sup> This has opened new vistas, increased awareness and raised aspirations of personal growth along with economic pressure, which has been instrumental in influencing women's decision to enter the work force.<sup>7</sup> The entry of women in the paid jobs is not accompanied with a simultaneous shift in the social division of labour. Women who work outside the home are required to make many socio-familial adjustments, thus confronted with the challenge of playing the dual-role to excel at home as well as at the workplace, which leads to overwork and often are stressed out. Since the tasks done by women at home for the nurturing of family have been of great significance, their under fulfilment may lead to further problems in the society.<sup>9</sup> So, this in turn leads to increased stress and strain among working women.

Sleep-related disorders (SRDs) though frequent, are under-reported and their implications are often neglected.<sup>10</sup> These findings suggest a need for research on determining the factors related to poor sleep quality among working women. Very few community-based studies have been conducted in India to understand this problem. Hence the present study was undertaken to assess the quality of sleep and factors affecting it among working women in the urban area using Pittsburgh Sleep Quality Index (PSQI).

## METHODOLOGY

This study was a community based, cross-sectional study, which was carried out for a period of 6 months, from August 2016 to January 2017. The study was conducted among working women, in the field practice area of Urban Health Training Centre attached to a tertiary care hospital.

The sample size calculated was 234, using the formula  $4pq/L^2$ , where p is the prevalence (30.04%)<sup>11</sup>, q = 1-p (69.96%) and L the permissible error, taken as 20% at 5% alpha error.

A house-to-house survey was carried out by doing systematic random sampling (every 10<sup>th</sup> house was considered). Only one working women was considered from each house, as she was considered to be representative of the selected family. Women who were paid wages for the work done by them were considered as working women.

Women aged 18 years and above, residing in the study area for more than 1 year, who consented to

participate on a voluntary basis, were included in the study. Women not complying with the inclusion criteria were excluded.

Data was collected by interviewing all 234 working women by conducting house-to-house survey using a pre-designed, pre-tested proforma and Pittsburgh Sleep Quality Index (PSQI) questionnaire.<sup>12</sup> Tested proforma included questions on the socio-demographic profile, their monthly income and their work status. The PSQI was used to assess quality of sleep during the past month and contained 19 self-rated questions from which seven component scores were calculated.<sup>13,14,15</sup> The component scores consist of subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Component scores were summed into a global score with higher scores representing worse sleep quality. The component scores range from 0 to 3 and global scores range from 0 to 21.<sup>16,17</sup> A global score of less than 5 was considered as normal and any score equal to or greater than 5 was indicative of poor sleep quality.<sup>3,18</sup> The PSQI questionnaire used for the study purpose was translated to vernacular language and validated by the investigators.

Data was collected after signing a written informed consent form on voluntary basis and confidentiality was assured. The study was approved and ethical clearance was obtained from Institutional Ethics Committee. Data were analysed using SPSS software version 20.0. Descriptive statistics and Chi-square test was applied to find an association between two attributes and P<0.05 was considered as statistically significant.

**Statistical analysis:** Data was entered in Epidata data entry client v3.1 and analysed in SPSS v20.0. Descriptive statistics like frequencies, percentages, mean and standard deviation were applied and chi square test ( $\chi^2$ ) was applied to determine association between two attributes and p<0.05 was considered as statistically significant. Odds ratio with 95% confidence interval was calculated.

## RESULTS

A total of 234 working women were included in the study. The socio-demographic characteristics of the study participants are shown in Table.1, where majority of 41.5% were in the age group of 30-39 years. 34.6% women had completed high school education, 53.4% belonged to Class I socio-economic status (SES, Modified B. G. Prasad's Classification 2016 - India)<sup>19</sup> and 83.3% were married.

Table.2 shows the working pattern of the study participants, where majority 49.6% of study partic-

ipants were doing sedentary work, 85.9% were working for 4-8 hours per day and 2.1% of working women even did night shifts.

**Table 1: Socio-demographic Characteristics of the Study Participants**

Socio-demographic Characteristics	Working women (n = 234) (%)
<b>Age ( in years)</b>	
20-29	54 (23.1)
30-39	97 (41.5)
40-49	64 (27.4)
50-59	17 (7.3)
>60	2 (0.9)
<b>Educational status</b>	
Illiterate	6 (2.6)
Primary	31 (13.2)
High school	81 (34.6)
Secondary	30 (12.8)
Graduate	65 (27.8)
Postgraduate	21 (9)
<b>Marital Status</b>	
Married	195 (83.3)
Unmarried	33 (14.1)
Widow / Divorced / Separate	6 (2.6)
<b>Socio economic status*</b>	
Class 1	125 (53.4)
Class 2	52 (22.2)
Class 3	36 (15.4)
Class 4	19 (8.1)
Class 5	2 (0.9)

\*As per Modified B. G. Prasad classification 2016.

**Table 2: Working pattern of Study Participants**

Working Pattern	Working women (n = 234) (%)
<b>Type of work</b>	
Sedentary	116 (49.6)
Moderate	106 (45.3)
Heavy	12 (5.1)
<b>Working hours</b>	
< 4 hours	8 (3.4)
4 - 8 hours	201 (85.9)
> 8 hours	25 (10.7)
<b>Night shift</b>	
No	229 (97.9)
Yes	5 (2.1)

**Table 3: Grading and Component-wise score analysis of Pittsburgh Sleep Quality Index.**

PSQI Grading	Working women (n= 234)
Poor sleep quality (≥5) (%)	170 (72.6)
Normal sleep quality (<5) (%)	64 (27.4)
<b>PSQI component</b>	<b>Mean (SD)</b>
Subjective sleep quality	1.01 ± 0.217
Sleep latency	1.08 ± 0.664
Sleep duration	1.24 ± 0.586
Habitual sleep efficiency	0.35 ± 0.626
Sleep disturbances	0.97 ± 0.260
Use of sleeping medication	0
Daytime dysfunction	0.59 ± 0.509

Table.3 shows the PSQI grading of quality of sleep, where a majority 72.6% of working women had a Global PSQI score of 5 and above, indicating poor sleep quality. The remaining 27.4% of working women had a Global PSQI score of less than 5, indicating normal quality of sleep. Mean PSQI score of study participants was 5.24 ± 1.408. Component wise score analysis of PSQI was done among study participants and mean scores were found to be, subjective sleep quality (1.01 ± 0.217), sleep latency (1.08 ± 0.664), sleep duration (1.24 ± 0.586), habitual sleep efficiency (0.35 ± 0.626), sleep disturbance (0.97 ± 0.260), use of sleep medication (0) and daytime dysfunction (0.59 ± 0.509) respectively.

Table.4 shows the association between demographic characteristics, working pattern and sleep quality among study participants. A majority 45.3% of study participants with normal sleep and 40% with poor sleep belonged to 30-39 year age group. 90.6% married women had poor sleep quality compared to 35.9% unmarried, who had normal sleep, which was statistically significant [ $\chi^2=23.55$ ,  $df=1$ ,  $p<0.0001$ ,  $OR=0.1852$  (95% CI = 0.08968 to 0.3825)]. 96.5% who were literates had poor sleep quality as compared to 3.5% who were illiterates. A majority of working women with normal sleep (39.1%) and with poor sleep (58.8%), belonged to Class I socio economic group (as per modified B. G. Prasad classification 2016), as compared to other socio economic groups, which was statistically significant ( $\chi^2=26.25$ ,  $df=3$ ,  $p<0.0001$ ). 92.4% women with poor sleep quality worked for ≤8 hours per day as compared to 7.6% who worked for >8 hours, which was statistically significant [ $\chi^2=6.007$ ,  $df=1$ ,  $p=0.0143$ ,  $OR=0.3588$  (95% CI = 0.1541 to 8.354)].

## DISCUSSION

The present study was aimed at assessing the quality of sleep among working women. In our study, 72.6% of study participants had poor sleep quality i.e., 7 out of 10 working women were suffering from poor sleep quality. Mean PSQI score of our study population was also on the higher side (5.24 ± 1.408). The reason being, working women has to finish her daily family chores in the morning and evening hours, as well as she has to work for a stipulated 7-9 hours at her work place, which adds up to the stress and strain leading to poor quality of sleep.

Our study showed that a majority, 41.5% of working women were in the age group 30-39 years, 83.3% were married, 34.6% were educated upto high school and 49.6% did sedentary level of physical activity as compared to a study done in Malaysia by Aazami S, et al.,<sup>20</sup> where a majority 37.8%

**Table 4: Comparison of Socio demographic characteristics with PSQI Grading**

Characteristics	PSQI Grading		P value	OR (95%CI)
	Normal sleep quality (n=64) (%)	Poor sleep quality (n=170) (%)		
<b>Age ( in years)</b>				
20-29	28 (43.8)	26 (15.3)	<0.0001	
30-39	29 (45.3)	68 (40.0)		
40-49	2 (3.1)	62 (36.5)		
>50	5 (7.8)	14 (8.2)		
<b>Educational status</b>				
Illiterate	0 (0)	6 (3.5)	0.2897	0.1962 (0.01089-3.535)
Literate	64 (100)	164 (96.5)		
<b>Marital Status</b>				
Married	41 (64.1)	154 (90.6)	<0.0001**	0.1852 (0.08968-0.3825)
Unmarried / Others	23 (35.9)	16 (9.4)		
<b>Socio economic status*</b>				
Class I	25 (39.1)	100 (58.8)	<0.0001**	
Class II	20 (31.3)	32 (18.8)		
Class III	19 (29.7)	17 (10.0)		
Class IV + V	0 (0)	21 (12.4)		
<b>Working hours</b>				
≤8 hours	52 (81.3)	157 (92.4)	0.0143**	0.3588 (0.1541-8.354)
> 8 hours	12 (18.8)	13 (7.6)		
<b>Night shift</b>				
Yes	3 (4.7)	2 (1.2)	0.0978	4.131 (0.6737-25.33)
No	61 (95.3)	168 (98.8)		

\*As per modified B. G. Prasad classification 2016; \*\*P value <0.05 indicate statistical significance

were in the age group 30-39 years, all the study participants were married, 65.5% had completed graduation and 66.2% of working women did sedentary work.

In our study it was found that the mean PSQI score of study participants was  $5.24 \pm 1.408$ . The sub-component scores of sleep duration ( $1.24 \pm 0.586$ ), sleep latency ( $1.08 \pm 0.664$ ), sleep disturbance ( $0.97 \pm 0.260$ ) and subjective sleep quality ( $1.01 \pm 0.217$ ) were comparatively higher. Similar findings were also noted in a study conducted in Chandigarh, India by Kaur G, et al.,<sup>5</sup> where the mean PSQI score was  $4.77 \pm 2.518$  and component scores of sleep latency ( $1.14 \pm 0.888$ ), sleep disturbance ( $1.20 \pm 0.569$ ) and subjective sleep quality ( $0.89 \pm 0.750$ ) were on higher side. In both these studies the minimum score was seen in sleep medication component, which means that consuming medicine for sleep deprivation is not a common behavior practiced among working women.

In our study, majority 83.3% of working women were married and among them 78.9% had poor sleep quality, which was higher when compared to that of single working women. Similar findings were seen in a study conducted in Iran by Asghari A, et al.,<sup>21</sup> where the mean global PSQI score was independently higher among married ( $5.38 \pm 3.43$ ), as compared to single subjects and the difference was statistically significant ( $p=0.04$ ). This may be because of increased domestic and childcare responsibilities among married working women leading to higher levels of work-family conflicts.

## CONCLUSION

Our study findings suggest that poor sleep quality was frequent among working women with lack of awareness acting as a major detrimental factor. Thus results emphasizes the importance of screening among working women for sleep related disorders at an early stage, which can be done at home and at work place. Positive psychology interventions like counselling, health education sessions regarding quality of life to improve work-life balance need to be implemented at work place across all levels, for improving sleep quality and maintaining well-being of working women population.

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## REFERENCES

- Menon B, Karishma HP, Mamatha IV. Sleep quality and health complaints among nursing students. *Ann Indian Acad Neurol* 2015;18(3):363-4.
- Shubha D, Titiksha C, Amitabh D, et al. Sleep Quality and its Relationship to General well-being in Ageing Adults. *Int Res J Social Sci* 2015;4(6):64-7.
- Neves GSML, Noe RA, Gomes MM. Sleep quality and quality of life in patients with epilepsy in a public teaching hospital in Rio de Janeiro, Brazil. *Rev Bras Neurol* 2015;51(2):53-8.

4. Zamanian Z, Nikeghbal K, Khajehnasiri F. Influence of Sleep on Quality of Life among Hospital Nurses. *ElecPhy* 2016;8(1):1811-6.
5. Kaur G, Sharma V, Singh A. Association of sleep quality with general health: an Indian college students study. *Int J Med SciPublic Health* 2015;4(12):1767-71.
6. Sun W, Yu Y, Yuan J, et al. Sleep Duration and Quality among Different Occupations - China National Study. *PLoS ONE* 2015;10(3):e0117700. doi:10.1371/journal.pone.0117700.
7. Reddy NK, Vranda MN, Ahmed A, et al. Work-Life Balance among Married Women Employees. *Indian J Psychol Med* 2010;32(2):112-8.
8. Mankani RV, Yenagi GV. Comparative study of mental health of working and non-working women. *Karnataka J. Agric. Sci* 2012;25(4):510-13.
9. Chandra V. Women and Work-Family Interface: Indian Context. *J Asia Pac Studies* 2010;1(2):235-58.
10. Panda S, Taly AB, Sinha S, et al. Sleep related disorders among a healthy population in South India. *Neurology India* 2012;60(1):68-74.
11. Mumbai's working women sleep deprived says survey. *The Times of India* 2015. Available at: <http://timesofindia.indiatimes.com/city/mumbai/Mumbais-working-women-sleep-deprived-says-survey/articleshow/46569286.cms>. Accessed Aug 7<sup>th</sup>, 2017.
12. Smyth C. Try this. *General assessment series* 2012(6.1). Available at: <http://www.sleep.pitt.edu/content.asp?id=1484&subid=2316>. Accessed Aug 7<sup>th</sup>, 2017.
13. Manzar MD, Moiz JA, Zannat W, et al. Validity of the Pittsburgh Sleep Quality Index in Indian University Students. *Oman Med J* 2015;30(3):193-202.
14. Bower B, Bylisma LM, Morris BH, et al. Poor reported sleep quality predicts low positive affect in daily life among healthy and mood-disordered persons. *J Sleep Res* 2010;19:323-32.
15. Mollayeva T, Thurairajah P, Burton K, et al. The Pittsburgh sleep quality index as a screening tool for sleep dysfunction in clinical and non-clinical samples: A systematic review and meta-analysis. *Sleep Med Rev* 2016;25:52-73.
16. Lo CMH, Lee PH. Prevalence and impacts of poor sleep on quality of life and associated factors of good sleepers in a sample of older Chinese adults. *Health Qual Life Out* 2012;10(1):72-9.
17. Knutson KL, Rathouz PJ, Yan LL, et al. Stability of the Pittsburgh Sleep Quality Index and the Epworth Sleepiness Questionnaires Over 1 Year in Early Middle-Aged Adults: The CARDIA Study. *Sleep* 2006;29(11):1503-6.
18. Burkhalter H, Sereika SM, Engberg S, et al. Structure validity of the Pittsburgh Sleep Quality Index in renal transplant recipients: A confirmatory factor analysis. *Sleep Biol Rhythms* 2010;8:274-81.
19. Tabassum N, Rao RLL. An Update on B.G.Prasad's Socio-Economic Classification. *Journal of Medical Pharmaceutical and Allied Sciences* 2017:670-3.
20. Aazami S, Mozafari M, Shamsuddin K, et al. Work family conflict and sleep disturbance: the Malaysian working women study. *Industrial Health* 2016;54:50-7.
21. Asghari A, Farhadi M, Kamrava SK, et al. Subjective Sleep Quality in Urban Population. *Archives of Iranian Medicine* 2012;15(2):95-8.