



Effect of Job Stress on Sleep Quality and Mental Health in Pink-Collar Job Workers of Coastal areas of Puducherry District – A Cross-sectional Study

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KEYWORDS

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ABSTRACT:

Background:

Pink-collar workers are individuals engaged in care-oriented or service-based jobs, often historically associated with women's work. Anganwadi Workers (AWWs) in India are a key example of this group and serve as the first point of contact between rural communities and the public health system. These workers face high levels of mental stress due to demanding responsibilities, limited resources, and socio-economic pressures. Previous studies have reported a high prevalence of mental health issues among AWWs, with one study citing a staggering 72.9% prevalence of mental illness. Sleep quality has been increasingly recognized as a critical factor influencing mental health, particularly in vulnerable occupational groups. This study aimed to evaluate the impact of sleep quality on the mental health status of Anganwadi workers in the coastal areas of Puducherry district, while also exploring the correlation between mental health, sleep quality, and daytime sleepiness.

Methodology:

A cross-sectional study was conducted over six months from February 2024 to August 2024 in Puducherry district. The study population consisted of 227 Anganwadi workers selected through simple random sampling from a total of 546 eligible workers (those with at least one year of work experience). Participants were assessed using a semi-structured questionnaire that collected demographic and occupational information. Standardized tools such as the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and the 12-item General Health Questionnaire (GHQ-12) were used to assess sleep quality, daytime sleepiness, and mental health status, respectively. Data analysis involved descriptive statistics, inferential tests (independent t-test, ANOVA), and correlation analysis (Pearson's correlation). Kruskal-Wallis H test and Dwass-Steel-Critchlow-Fligner pairwise comparisons were employed to compare mental health status across different levels of sleep quality.

Results:

The study found that poor sleep quality significantly affects the mental health of Anganwadi workers. Mental health status was measured using GHQ-12 scores, with higher scores indicating greater psychological distress. There was a statistically significant association between sleep quality and mental health ($\chi^2 = 8.64$, $df = 2$, $p = 0.013$, $\epsilon^2 = 0.0417$). Pairwise comparisons revealed that participants with good sleep quality had significantly better mental health compared to those with poor sleep quality ($W = -4.052$, $p = 0.012$). Additionally, excessive daytime sleepiness showed a positive correlation with poorer mental health outcomes ($r = 0.128$, $p < 0.05$). Socio-demographic factors such as joint family structure, lower educational level, and prior job training were associated with better mental health status, while no significant relationship was observed between mental



health and age, work experience, or weekly working hours. Pearson correlation analysis confirmed a weak but significant positive relationship between sleep quality and mental health ($r = 0.106$), and between daytime sleepiness and mental health ($r = 0.128$).

Conclusion:

This study highlights the significant impact of sleep quality on the mental well-being of pink-collar workers, particularly Anganwadi workers in coastal Puducherry. Interventions aimed at improving sleep hygiene and addressing daytime sleepiness could play a crucial role in enhancing the mental health of this essential yet vulnerable workforce.

Introduction:

There are many different jobs in the world, which are typically classified as white-collar, blue-collar, pink-collar, or green-collar jobs, etc. Every job has its characteristics based on its requirements and responsibilities¹. The term pink-collar was first used after World War II to describe occupations traditionally done by women, Pink collar worker is Someone working in the care oriented fields or in fields historically considered to be women's work. This may include job in industry, Nursing, social work, teaching, secretarial work or child care. Given the expanding range of these jobs, considering their various aspects with an effect on people who perform those jobs seems essential. Anganwadi is classified as a pink-collar job². Workplace stress is defined as the change in one's physical or mental state in response to environments at work that presents an assessed challenge or threat to that employee. This change may be influenced by a toxic work environment, a heavy workload, isolation, and difficult relationships with managers and/or coworkers, or it may be related to the number of hours worked³. Work stress influences the development of subjective stress and psychosomatic Symptoms⁴. Stress when inherent in health can negatively impact health care professionals, leading to increased depression, Job burnout, psychological distress, and decreased sleep and Quality of life. burnout is a psychological reaction to ongoing work-related pressures that have been well-documented⁵. Heavy workload, poor training, insufficient staffing, job unhappiness, lack of organizational support, and unfavorable working circumstances are all associated with higher burnout⁶. The employee's stress with her job is the primary issue that hugely influences the quality of work and individual productivity⁷. Primary health care personnel are responsible for the methodical, well-

organized, and effective implementation of most government programs at the grassroots level, ensuring that services are delivered to beneficiaries on a consistent basis. Health care employees are a significant group who are influenced by emotional states and stress as a result of their specific work environment⁸. Work is good for mental health, but a bad work environment can cause issues with both physical and mental health. Low honoraria, onerous register work, protracted meetings that are frequently held outside of duty hours, low attendance of children and adolescent girls despite repeated reminders, education, and community activities, and inadequate space have all been long-standing problems for primary health care workers⁹. Anganwadi workers are female and hence it needs to be looked within documented research findings that women experience more occupation stress than men.¹⁰ In study among the grass root level workers at PHC in Bagalkot, 70.66% reported mental stress in past year¹¹. In another study from Mangalore, Author have 12% of respondents as being in work stress due to work pressure¹². Anganwadi workers (AWW) are the first level of contact to health system in the periphery¹³. There is a lack of information on the anganwadi worker's occupational stress¹⁴. The main purpose of this study was to investigate the effect of occupational factors, and job stress on mental health and sleep quality (including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, and daytime dysfunction) of Anganwadi Workers.

Materials and method:

This cross-sectional study was conducted among the Anganwadi Workers (AWW) of coastal areas of the Puducherry district. ICDS divided the Puducherry districts into four projects. Since the expected prevalence of Job stress is 83.3%¹⁵ and the participants were chosen



by Simple random sampling, with a non-response rate of 10% with a 5% margin of error the prevalence was taken for sample size calculation. Thus, the sample size came out to be 227. Out of 227 AWW workers 208 answered the questions. First, necessary arrangements were made with relevant authorities for collecting and recording the required information. Then, the participants were given the necessary explanations about the process and how they can participate in the study. To collect data, a semi structured questionnaire was used that included demographic information of the participants, such as age, gender, height, weight, marital status, level of education, work experience, and working hours per week. The inclusion criteria were all consenting Anganwadi Workers with at least 1 year's work experience. The exclusion criteria included Anganwadi workers with a history of approved psychological disorder, other disorders that may affect the sleep quality such as preexisting heart disease (e.g., heart failure) or lung disease (e.g., COPD), as well as sleep disorders with other causes such as obstructive sleep apnoea, etc., and medications use or an irrelevant second job.

Data Collection Instruments

Pittsburgh Sleep quality index questionnaire (PSQI)

The PSQI was used to analyze sleep quality. The questionnaire entails 19 items, used to create seven components with a score ranging between 0 (no problem) and 3 (major problem). The total score from these seven components varies between 0 (no problem) and 21 (major problem). Based on the previous studies, a global score of ≥ 5 could be used to identify people with poor sleep quality^{16,17} So the cutoff point in this study was considered 5. People with a score of 5 or higher, experienced poor sleep quality, and those with a score of less than 5 experienced good sleep quality. The validity and reliability of the questionnaire were approved with a Cronbach's alpha of 0.77¹⁸.

Epworth Sleepiness Scale (ESS)

The ESS was employed to measure excessive daytime sleepiness. This 8-item questionnaire measures a person's general level of sleepiness and its likelihood in different situations. Each item is scored between 0 and 3.

The overall ESS score ranges between 0 (no chance of sleepiness) to 24 (high chance of sleepiness in all 8 conditions). Clinically, an ESS score higher than 10 indicates excessive daytime sleepiness¹⁹. A domestic study confirmed the validity and reliability versions of ESS²⁰.

12-item general health questionnaire

To measure mental health status, the 12-item general health questionnaire measures both positive (6 items) and negative (6 items) aspects of mental health. In this questionnaire, the Likert scale was used for data analysis. The first scoring format of this questionnaire is 0-1-2-3. A higher total score indicates problems with mental health. The second scoring format is 0-0-1-1, based on which a GHQ score higher than 2 indicates psychological distress, and scores higher than 4 indicate psychological impairment²¹. In other words, participants with an overall score of 4 or higher have a major mental disorder

Job Stress questionnaire

Job stress was measured using a tailor-made questionnaire for symptoms of job stress, which included 16 questions with five-point Likert scale to rate dimensions of job stress. Total score was made by adding the items. A high score indicated higher job stress. Cronbach's alpha = 0.903²²

Statistical analysis:

After excluding the uncompleted questionnaires, the remaining questionnaire was analyzed with Jamovi Version 2.3. The quantitative variables were expressed as mean and standard deviation and the qualitative variables as frequency and percentage. The independent t-test and ANOVA was used to examine the relationship between mental health status with demographic and occupational factors as well. One way Analysis of variance (ANOVA) was used to assess mental health status, daytime sleepiness, and sleep quality based on whole job stress and its items. A correlation test was used to assess the relationship between sleep quality, job stress, and general health. The P value is less than 0.05 is statistically significant.

**Table 1: Distribution of study participants according to their socio-demographic profile and work-related status**

Variables	N (n=208)	%	
Age category (In Years)	<45	128	61.5 %
	≥45	80	38.5 %
Educational Qualification	High School	28	13.50%
	Higher Secondary	46	22.10%
	Graduate	134	64.50%
Type of family	Nuclear	196	94.20%
	Joint	12	5.80%
Socio-economic status (Modified BG Prasad Scale)	Class-1	34	16.40%
	Class-2	125	60.40%
	Class-3	30	14.50%
	Class-4	12	5.80%
	Class-5	6	2.90%
Marital status	Single	11	5.30%
	Married	197	94.70%
BMI	Underweight	51	24.50%
	Normal	65	31.30%
	Overweight	33	15.90%
	Obese	59	28.40%
Physical activity	Yes	142	68.30%
	No	66	31.70%
Job category	Permanent	191	91.80%
	Contract based	17	8.20%
Training of Job	Yes	190	90.90%
	No	19	9.10%
Job security	Yes	191	91.40%
	No	18	8.60%
Medical illness	No illness	166	79.80%
	Type-2DM	29	13.90%
	HTN	13	6.30%



Years of experience	Less than 15	157	75.50%
	More than 15	51	24.50%

[Table 1] Out of 227 questionnaires distributed among participants, 208 were completed with a response rate of 90%. Totally, 208 female participants were part of the study. 134 (64.5%) had completed graduation; 197 (94.7%) were married; 196 (94.2%) belonged to the nuclear family, and 128 (61.5%) belonged to the age group of fewer than 45 years, 125 (60.4%) belonged to

class 2 (Modified BG Prasad classification 2021). Moreover, (68.3%) had physical activity exercised regularly, 42 (20.2%) had a medical illness, 191(91.8%) had a permanent job, 190 (90.9%) had received training before appointment to a job, 191 (91.8%) had job insecurity, and 157 (75.5%) had work experience of fewer than 15 years.

Table-2: Assessing mental health status based on demographic and occupational factors by independent t-test

Variables		GHQ_ -12 Mean±SD	p-value
Age category (In Years)	<45	12.1±2.89	0.967
	≥45	12.1±2.94	
Educational Qualification	High School	10.9±2.35	0.023*
	Higher Secondary	12.3±2.98	
	Graduate	12.3±2.87	
Type of family	Nuclear	12.2±2.90	0.041*
	Joint	10.4±2.64	
Socio-economic status	Class-1	11.5±3.22	0.148
	Class-2	12.2±2.87	
	Class-3	12.1±2.74	
	Class-4	11.8±3.19	
	Class-5	14.0±1.79	
Marital status	Single	10.5±3.56	0.072
	Married	12.2±2.85	
BMI	Underweight	12..3±3.22	0.852
	Normal	11.9±2.91	
	Overweight	11.9±2.91	
	Obese	12.2±2.66	
Physical activity	Yes	7.76±2.39	0.993
	No	7.76±2.05	
Job category	Permanent	12.1±2.78	0.247



	Contract based	11.7±4.13	
Training of Job	Yes	12.2±2.94	0.021
	No	10.7±2.21	
Job security	Yes	12.0±2.90	0.216
	No	12.9±2.84	
Medical illness	No illness	12.0±2.89	0.330
	Type-2DM	12.8±2.99	
	HTN	11.5±2.88	
Years of experience	Less than 15	12.0±3.07	0.578
	More than 15	12.3±2.36	

(Table 2) Data on mental health status: Assessing mental health status based on demographic and occupational factors by independent t-test. The mean general health score in the participants was 7.66 ± 2.28 with the lowest and highest scores of 0 and 33, respectively. The t-test results showed that mental health was significantly better

in nuclear family, had received training before appointment to a job Training: The mean score of ESS was 13.7 ± 3.38 with the lowest and highest scores of 0 and 24, respectively. About 79 participants (84.6%) had abnormal daytime sleepiness (score >10).

Statistical Results:

Table 3: Comparison of General Health score between different levels of job stressors by analysis of variance One way ANOVA)

		General Health Score	p-value
Coping adequately with your job	Suffering from the job& Preventive action	-1.32	0.272
	Prevention action to avoid Job burnout	-2.48	0.016*
	You are burning & develop comprehensive Job stress Management	-1.875	0.553
Suffering from the job& Preventive action	Prevention action to avoid Job burnout	-1.16	0.066
	You are burning & develop a comprehensive Job stress Management Plan	-0.554	0.967
Prevention action to avoid Job burnout	You are burning & develop a comprehensive Job stress Management Plan	0.607	0.963

Interpretation: A one-way ANOVA was performed to compare job stress on Mental health status. Participants were classified into four groups, group 1 (n =32), group

2 (n =112), group 3 (n =56), and group 4 (n =8). Based on a visual examination of the Q-Q plot, it was determined that the General Health questionnaire was



normally distributed for each group. The equal variance assumption was not made as the Levene statistics ($p < 0.001^*$, $F\text{-value} = 8.20$) are significant. Post-hoc comparison using the Games Howell was chosen to look for individual differences between the group. This test

showed that the mean difference for Coping adequately with your job (Mean difference = -2.48) was significantly differed, from preventive action to avoid job burn out. The mean difference was significant at the level of 0.005. However, no significant difference between other groups

Table-4: Comparison of Epworth sleepiness scale between different levels of job stressors by analysis of variance One way ANOVA)

		Epworth Sleepiness Scale	p-value
Coping adequately with your job	Suffering from the job& Preventive action	-4.58	<0.01
	Prevention action to avoid Job burnout	-9.07	<0.01
	You are burning & develop comprehensive Job stress Management	-7.66	<0.004*
Suffering from the job& Preventive action	Prevention action to avoid Job burnout	-4.49	<0.01*
	You are burning & develop a comprehensive Job stress Management Plan	-3.08	0.233
Prevention action to avoid Job burnout	You are burning & develop comprehensive Job stress Management Plan	1.41	0.770

Interpretation: A one-way ANOVA was performed to compare the effect of job stress on sleepiness. Participants were classified into four groups, group 1 ($n = 32$), group 2 ($n = 112$), group 3 ($n = 56$), and group 4 ($n = 8$). Based on a visual examination of the Q-Q plot, it was determined that the Epworth Sleepiness score was normally distributed for each group. The equal variance assumption was not made as the Levene statistics ($p\text{-value} = < .001^*$, $F\text{-value} = 20.1$) are significant. Post-hoc comparison using the Games Howell was chosen to look for individual differences between the group. This test

showed that the mean difference for Coping adequately with your job (-4.58) was significantly differed from Suffering from the job and Preventive action, Preventive action to avoid job burn out (M.D = -9.07) as well as you are burning and develop comprehensive job stress management (M.D = -7.76). Suffering from the Job and preventive action (M.D = -7.79) significantly differed from prevention action to avoid job burn. the mean difference was significant at the level of 0.005. However, no significant difference between other groups

Table-5: Comparison of Pittsburg sleep Quality between different levels of job stressors by analysis of variance One way ANOVA)

		Pittsburg sleep Quality	p-value
Coping adequately with your job	Suffering from the job& Preventive action	-2.19	0.08
	Prevention action to avoid Job burnout	-3.30	0.007



	you are burning & develop comprehensive Job stress Management	-5.50	0.01
Suffering from the job& Preventive action	Prevention action to avoid Job burnout	-1.12	0.44
	you are burning & develop a comprehensive Job stress Management Plan	-3.31	0.18
Prevention action to avoid Job burnout	you are burning & develop comprehensive Job stress Management Plan	-2,20	0.58

Interpretation: A one-way ANOVA was performed to compare the effect of job stress on Sleep quality. Participants were classified into four groups, group 1 (n =32), group 2 (n =112), group 3 (n =56), and group 4 (n =8). Based on a visual examination of the Q-Q plot, it was determined that the pits burg sleep quality score was normally distributed for each group. The equal variance assumption was made as the Levene statistics (p-value = <.002*, F-value= 4.94) are significant. Post-hoc comparison using the Tukey was chosen to look for individual differences between the group. This test showed that the mean difference for Coping adequately with your job (-3.30) was significantly differed from Preventive action to avoid job burnout ((M.D =-9.07). Coping adequately with your job (M.D =-5.50) significantly differed from You are burning and develop comprehensive job stress management. The mean difference was significant at the level of 0.005. However, no significant difference between other groups

Fig.1 Scatter plot for relationship between sleep quality, job stress and general health score

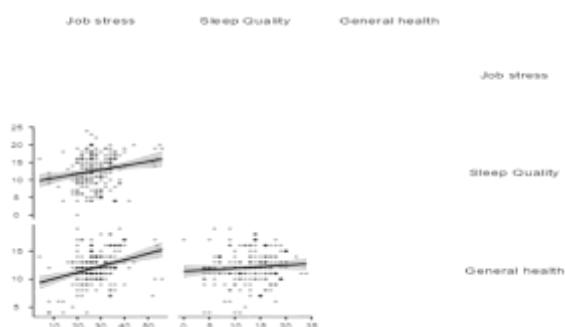


Figure 1: Scatter plot for relationship between sleep quality, job stress and general health score

Pearson's product-moment correlation was to find out the relationship between Job stress, Sleep quality, and General health. Preliminary analyses showed the relationship to be linear between all pairs of variables, all variables are normally distributed as indicated by the Q-Q plot. There was a mild positive correlation between sleep Quality and Job stress ($p < 0.003^*$) and General health and Job stress were statistically significant ($p < 0.003^*$)

Discussion

The present study aimed to investigate the effect of work-related factors on sleep quality and mental health of Anganwadi workers. The mean score of general health was 7.66 ± 2.28 workers 68% of the participants indicated significant psychological impairment, which was higher in this studies compared to others studies on AWW¹². According to family type, this study found that nuclear families had statistically significant levels of poor mental health. The Results from current study shows (84.5%) Respondents having high level of job stress in comparison with Study done by Bhatnagar et al. showed that 71.5% AWWs have moderate stress level²³. Study done by Shabsank et al. showed that the schedule of working health care professionals is ever growing which could be possible factor for increased stress²⁴. The Present Study shows 26.9% having moderate stress 2.9% having severe stress .Ashwathy et al. among Anganwadi workers at Kasargod, Kerala showed 83.3% had moderate levels and 16.7% had severe levels of stress¹⁵. All these studies have shown that Emotional labour and burnout related to work have widely confederated with jobs that demand high public interaction and also have showed that Community health workers who are associated with people and need interaction with people



have higher chances of stress and work-related burnout. Study done by Li et al. showed that low salary, heavy workload and few promotion opportunities were the most frequently cited workplace stressors²⁵. The study done by Dyrbye et al. high prevalence of burnout among Health care professionals was also noted²⁶. All these studies have shown that stress related to work has ramified primary health workers physical and mental health ascending to professional burnout syndrome mainly because of work situations at field level. The present study showed higher scores of Burnouts among various factors although with statistically significant difference

Timely identification of this emotional diminution is needed to avoid the reification of the health care worker-patient relationship. Burnout needs to be addressed as a health care professional's Stress reducing physical activity like established stress management exercise with mindfulness-based intervention, improving the competence by regular training and performance by regular evaluation, working on strengthen mental health added with reduced inter- colleague and inter-organizational changes are extremely necessary in reducing stress anxiety and burnout among health care workers²⁷. Contribution of AWW workers towards basic biomedical care has been increasing with time. Their contribution towards health education and providing primary health care at the village level has been indispensable. AWW workers have become inevitable part of primary health care playing a pivotal role forming the much-needed link between village and health care. AWW workforce has become a strategic opportunity to reduce pressure on the health system. Therefore measures must be taken at early to protect this workforce from mental health abnormalities because of community level challenges faced by them.²⁸

Examining the relation between job stress and sleep quality, it was found that job stress is directly correlated with poor sleep quality. Various studies have been conducted on the relation between job stress and sleep quality. For instance, a study Deng et.al., on the effect of job stress on sleep quality in job stress negatively correlated with sleep Quality²⁹. But that strength has led to some limitations. Using several questionnaires could reduce the participants' accuracy in answering all the questions.

Strength and Limitation of the Study

Our study achieved adequate response rate of 90%. Our study used standard validated tools for collecting the data among study participants. Our study focussed on coastal population of Puducherry district. Due to nature of study design, this study cannot establish the causal relationship or temporality. Our study recommend to provide periodic training for the pink collar job worker

Conclusion

Based on the findings of this study, mental health was significantly better in nuclear family, had received training before appointment to a job Training. However, effect was found between various Job stress on sleep quality and Job stress on general health status. There was a significant relationship between sleep quality and mental health score in that poor sleep quality was associated with a lower level of mental health. There was no significant relationship between sleep quality with age, BMI, and work experience.

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