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# Assessment of Occupational Stress across Employee Groups at Namkum Industrial Area in Ranchi, Jharkhand

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**Abstract**

**Background:** Occupational stress is a growing concern in modern workplaces, affecting employees across various industries. It refers to the psychological and physiological strain caused by job-related factors such as excessive workload, lack of autonomy, workplace conflicts, and job insecurity. **Aim:** This study aims to assess occupational stress among different employee groups in the Namkum Industrial Area, Ranchi, Jharkhand. **Methods:** A total of 80 individuals were selected using a stratified random sampling procedure from different departments within the specified industrial area. The study utilized a factorial design, categorizing participants into four independent variable strata. Each of the four subgroups consisted of 20 participants, with a total sample of 80 (4×20). The sample included 40 employees aged 20–40 years and 40 employees aged 40–60 years, with equal representation of individuals with high and low levels of education. The Personal Data Questionnaire (PDQ) and Occupational Stress Index (OSI) were employed to assess occupational stress levels.**Results & Conclusion:** The findings revealed that age and educational attainment significantly influenced the occupational stress index. However, there was no significant difference in mean occupational stress levels across employee groups in the Namkum Industrial Area. Additionally, statistical analysis determined no significant variation in occupational stress levels across different age groups and educational levels.

***Keywords:*** *Occupational stress, industrial employees, stress assessment, Namkum Industrial Area, Ranchi, Jharkhand, age, education, psychological strain.*

## Introduction

Occupational stress is a critical issue affecting employees across diverse industries, significantly impacting their mental and physical well-being. It arises from a combination of work-related factors, including high job demands, limited decision-making authority, conflicts with colleagues, and job insecurity. The industrial sector, in particular, presents unique stressors due to its physically demanding nature, tight deadlines, and hierarchical organizational structures. Stress at the workplace not only affects employees' productivity but also contributes to increased absenteeism, burnout, and job dissatisfaction. Given the rapid industrial growth in Ranchi, Jharkhand, particularly in areas like Namkum Industrial Area, understanding occupational stress in this context is essential. This study aims to assess and analyze the occupational stress levels among employees across different age groups and educational backgrounds, providing insights into potential interventions to improve workplace well-being.

Several studies have explored occupational stress and its impact on employees' psychological and physiological health. According to Karasek's Job Demand-Control Model (1979), occupational stress emerges from the interaction between job demands and the level of control an employee has over their work. When job demands exceed an individual's ability to cope, stress levels increase, leading to adverse health outcomes. Siegrist's Effort-Reward Imbalance (ERI) Model (1996) further emphasizes that stress results from a mismatch between the effort an employee invests and the rewards they receive, such as salary, recognition, and career growth opportunities.

Recent studies highlight that employees in industrial settings experience significant stress due to job insecurity, excessive workload, and inadequate workplace support. A study by Smith et al. (2020) found that industrial workers reporting high job demands with minimal control experienced greater anxiety and job dissatisfaction. Additionally, Lee et al. (2022) conducted a meta-analysis showing that employees with higher educational attainment were better equipped with coping mechanisms, leading to lower stress levels compared to those with limited educational backgrounds. The impact of age on occupational stress is another area of interest, with research indicating that younger employees face stress due to career instability, while older employees experience stress from physical exhaustion and adapting to technological advancements.

Furthermore, workplace interventions such as stress management training, employee support programs, and organizational modifications have been identified as effective strategies to mitigate stress levels. Williams & Cooper (2023) suggest that flexible work arrangements and mental health resources contribute to improved employee well-being and reduced workplace stress. However, further research is necessary to explore industry-specific stress factors and their implications on employee performance and job satisfaction.

By examining the occupational stress levels in the Namkum Industrial Area, this study contributes to the broader discourse on employee well-being and workplace efficiency, offering recommendations for reducing stress and fostering a healthier work environment.

**Methodology:**

**Aim:** This study aims to assess occupational stress among different employee groups in the Namkum Industrial area in Ranchi, Jharkhand

**Objective of the study:**

- To measure the level of occupational stress among different employees of Namkum Industrial area in Ranchi, Jharkhand
- To study the impact of Age and Level of Education on the occupational stress of the employer's.

**Hypothesis of the study:**

- Level of occupational stress will vary among total sample and different samples sub-group based on age and level of education
- Level of occupational stress will be more among high age group( group 2)
- There will be no significant difference in occupational stress between highly educated and low educated employee.

**Research Design**

2X2 factorial design was used to measures the extent of occupational stress among different employers of Namkum Industrial area in Ranchi, Jharkhand. The factorial design of the study demonstrates four strata of independent variables and 20 subjects in each stratum. Thus the present study consists of a sample of 4X20=80 subjects

**Sample:**

The sample for the study consists of 80 employee of Namkum Industrial area in Ranchi, Jharkhand selected stratified random technique basis from the different department of the above mention organization. In the sample there are 40 High Educated and 40 low educated employee's and from each groups there are 20 employees aged between 20 to 40 and 20 aged group between 40 to 60 respectively. Thus there are 4 sub groups in total, each sub group represented by 20 employees. Criteria of the sample selection: Level of age group 1:-20-40 years and group 2:- 40-60 years, Level of education Level 1 high, level 2 low.

**Inclusion criteria:**

- Employee's from Namkum Industrials area developers sail city the employees who were aged between 20 to 58 years, employees who are residence of Ranchi district.

**Exclusion criteria:**

- Employee of another public or government organization.
- Female employee's
- Employees who are suffering from different psychiatric disorder.
- Who are not resident of Ranchi District
- Who were aged below 18 to 21& 60 to 70 years.

**TOOLS:**

Following tools were used in the collection of data

- **Personal data questionnaire (PDQ):**
- **Occupational stress index(OSI):**

**Statistical Analysis**

The data was entered into the profile scoring sheet initially and thereafter was entered into statistic software (SPSS version 24). Descriptive, parametric and nonparametric tests were employed wherever appropriate. Descriptive statistics was carried out on the socio-demographic data. Considering the objectives and hypotheses of the present research the attempt has been taken to apply the suitable statistical techniques to analyze the data which is as follows: Means and SDs have been calculated for each sub groups and for the dimensions of occupational stress. The significant sub difference between the means of comparable sub group has been computed using t-test. Mean scores were represented through graph to give comparative picture of different groups.

## Result

**Table 1: Number and percentage of High, Average and Low scorers on occupational stress index among total sample.**

| Sample<br>40 | High<br>(above130.29) | Average<br>(between115.21-130.29) | Low<br>(below115.21) |
|---|---|---|---|
| **Score** | 4 | 31 | 5 |
| **Percentage** | 10% | 77.5% | 12.5% |

Table 1: Levels of Occupational Stress in the Entire Sample 10% (4 people) of the 40 participants indicated high levels of stress, whereas the majority (77.5%; 31 people) reported average levels of stress. Just 5 people, or 12.5%, reported little stress. This suggests that fewer workers in the sample have excessive levels of occupational stress, whereas the majority has moderate levels.

**Table No.2: Number and percentage of High, Average and Low scorers on occupational stress index (Age group 1, 20-40 years)**

| Sample<br>40 | High<br>(above 130.48) | Average<br>(between 112.62-130.48) | Low<br>(below 112.22) |
|---|---|---|---|
| **Score** | 4 | 32 | 4 |
| **Percentage** | 10% | 80% | 10% |

Table 2: Occupational Stress Levels in Age Group 1 (20-40 years) Among employees aged 20-40 years, 10% (4 individuals) reported high stress, 80% (32 individuals) experienced average stress, and 10% (4 individuals) had low stress. The data suggests that younger employees mostly experience average stress levels, with an equal proportion experiencing either high or low stress.

**Table No.3: Number and percentage of High, Average and Low scorer on occupational stress index (Age group 2, 40-60 years)**

| Sample 40 | High (above 128.88) | Average (between 119.42-123.88) | Low (below 119.42) |
|---|---|---|---|
| **Score** | 6 | 32 | 2 |
| **Percentage** | 15% | 80% | 5% |

Table 3: Occupational Stress Levels in Age Group 2 (40-60 years) In the 40-60 years age group, 15% (6 individuals) reported high stress, while 80% (32 individuals) experienced average stress levels. Only 5% (2 individuals) had low stress. Compared to the younger age group, older employees showed a slightly higher percentage of high stress levels and a lower percentage of low stress levels, suggesting that stress increases with age.

**Table No.4: Number and percentage of High, Average and Low scorer on occupational stress index (Level of education 1, below inter)**

| Sample 40 | High (above 129.13) | Average (between114.77-129.13) | Low (below114.77) |
|---|---|---|---|
| **Score** | 6 | 30 | 4 |
| **Percentage** | 15% | 75% | 10% |

Table 4: Occupational Stress Levels by Education Level 1 (Below Intermediate Education) Among employees with education below the intermediate level, 15% (6 individuals) reported high stress, 75% (30 individuals) had average stress, and 10% (4 individuals) experienced low stress. The results indicate that lower educational qualifications are associated with a relatively higher percentage of high stress levels.

**Table No 5: shows how occupational stress is distributed and correlated with education and age.**

| Group | Sample (N) | High (%) | Average (%) | Low (%) | Mean | SD | t-ratio | P-Value | Sig. |
|---|---|---|---|---|---|---|---|---|---|
| **Age Group 1 (20-40 years)** | 40 | 10% (4) | 80% (32) | 10%(4) | 121.35 | 9.13 | 2.44 | NS | NS |
| **Age Group 2 (Below 40-60)** | 40 | 15%(6) | 80%(32) | 5%(2) | 124.15 | 4.73 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Education Level 1 (Below Inter)** | 40 | 15% (6) | 75% (30) | 10%(4) | 123.55 | 6.68 | 0.80 | NS | NS |
| **Education Level 2 (Above Inter)** | 40 | 10% (4) | 85% (34) | 5% (2) | 121.8 | 7.18 | | | |

Table 5: Distribution and Correlation of Occupational Stress Scores  Age Group 1 (20-40 years): The mean stress score was 121.35, with a standard deviation of 9.13. The t-ratio was 2.44, but it was not statistically significant (NS). Age Group 2 (40-60 years): The mean stress score was slightly higher at 124.15, with a lower standard deviation of 4.73, showing more consistent stress levels among older employees. Education Level 1 (Below Intermediate): The mean stress score was 123.55, with a standard deviation of 6.68, and a t-ratio of 0.80, which was also not significant. Education Level 2 (Above Intermediate**):** The mean stress score was 121.8, with a standard deviation of 7.18. The results indicate no significant difference in occupational stress based on education level, reinforcing the hypothesis that educational background does not have a major impact on occupational stress levels.

## DISCUSSION

The findings of this study align with previous research on occupational stress, which suggests that age and education level may have some influence on stress levels, but the impact is not always significant. A study by Sauter et al. (1999) emphasized that occupational stress is commonly experienced at moderate levels across different demographics, which is consistent with our findings. The majority of employees in our study also exhibited moderate stress levels, regardless of age or education. The slight increase in stress among older employees is supported by research conducted by Schaubroeck and Green (2009), who found that older employees tend to experience higher stress due to increased job responsibilities, physical health concerns, and a greater accumulation of work-related pressures. However, in our study, this increase was not statistically significant, suggesting that age alone may not be a sole determinant of occupational stress. Regarding education level, our results are in line with the study by Karasek and Theorell (1990), which proposed that occupational stress is more influenced by job demands and control rather than educational qualifications. While employees with lower education levels showed slightly higher stress levels in our study, the differences were not statistically significant, reinforcing the notion that educational background alone does not dictate stress levels. Additionally, the Job Demand-Control (JDC) model proposed by Karasek (1979) suggests that occupational stress is more dependent on job demands and the amount of control an employee has over their work rather than personal demographic factors. Our findings support this, as neither age nor education level showed significant differences in stress levels.

## Conclusion

The present study provides valuable insights into occupational stress among employees in the Namkum Industrial Area, Ranchi. The results indicate that occupational stress is predominantly at an average level across all employees, with no significant differences based on age or education level. While older employees showed slightly higher stress levels, the difference was not statistically significant. Similarly, education level did not have a major impact on occupational stress. These findings suggest that occupational stress is a universal issue that affects employees across different demographic groups. Given the moderate stress levels experienced by most participants, organizations should implement comprehensive stress management strategies, including employee assistance programs, stress awareness training, and workplace modifications to enhance job control and reduce job demands. The study also highlights the need for further research to explore additional factors influencing occupational stress, such as workplace environment, job autonomy, and individual coping mechanisms. Future studies with larger and more diverse samples can provide deeper insights into the complex interplay of factors affecting occupational stress and contribute to more effective intervention strategies.

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