

## Awareness and Enforcement of Labor Enactments: A Study of Workers at Vizagapatnam Steel Plant

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### ABSTRACT

The present study aims to examine the awareness and enforcement of labor enactments among employees at Vizag Steel Plant, with a particular focus on understanding the role of individual and organizational factors in shaping knowledge of labor laws. Four key hypotheses were formulated for empirical testing. First, the study investigates whether workers are aware of labor laws and their rights, assessed using a one-sample t-test against a benchmark awareness score. Second, it explores differences in awareness levels between permanent and contractual employees through an independent samples t-test. Third, the impact of training programs on improving workers' knowledge of labor enactments is evaluated using a paired sample t-test, measuring pre- and post-training knowledge scores. Finally, the relationship between employees' education level and their awareness of labor laws is examined using Pearson correlation analysis. Data were collected via structured questionnaires administered to a representative sample of employees across departments. The findings are expected to provide insights into the effectiveness of current training initiatives, highlight disparities in awareness across employment types, and underscore the importance of education in promoting labor law compliance. These insights aim to inform policymakers and organizational management in designing systematic processes for the enforcement of labor enactments, ultimately contributing to a more compliant and informed workforce at Vizag Steel Plant.

**KEYWORDS:** Labor enactments, labor law awareness, employee training, Vizag Steel Plant, permanent employees, contractual employees, education level, compliance, workforce development.

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### 1. INTRODUCTION

Labor laws and enactments play a crucial role in ensuring the protection of workers' rights, maintaining industrial harmony, and promoting a safe and fair working environment. In India, where industrialization and employment opportunities are rapidly expanding, the enforcement of labor laws has become increasingly significant. Steel plants, as large-scale industrial establishments, employ a diverse workforce, including permanent, contractual, and temporary employees. This diversity often presents challenges in ensuring uniform awareness and compliance with labor enactments.

Vizagapatnam Steel Plant, being one of the major steel manufacturing units in India, provides a representative context to study the systematic processes of labor law enforcement. The plant's workforce comprises employees with varying educational backgrounds, experience levels, and employment types.

These factors can influence their awareness of labor rights, responsiveness to training programs, and adherence to legal requirements. Consequently, understanding the level of awareness among workers and the factors that affect it is essential for both managerial decision-making and policy formulation.

Recent trends in labor management emphasize the role of proactive enforcement mechanisms, such as structured training programs, grievance redressal systems, and periodic inspections. Such mechanisms aim to reduce violations, promote compliance, and ensure the welfare of employees. However, disparities often exist in how these processes are implemented and perceived across different employee groups, highlighting the need for empirical research.

The current study focuses on four key areas: evaluating workers' awareness of labor laws, comparing awareness levels between permanent and contractual employees, assessing the impact of training programs on knowledge enhancement, and examining the relationship between educational background and labor law awareness. By addressing these areas, the study seeks to provide insights into the effectiveness of enforcement processes, identify gaps in awareness, and recommend strategies for improving compliance at Vizag Steel Plant.

Ultimately, the findings of this research are expected to contribute to a better understanding of labor law enforcement in large industrial setups, supporting policymakers and management in creating a systematic and equitable framework for labor welfare and compliance.

## 2. RESEARCH METHODOLOGY

### 2.1 Research Design

This study adopts a descriptive and analytical research design to examine the awareness, enforcement, and factors influencing labor enactments among employees at Vizag Steel Plant, Vizag. The descriptive component provides an overview of the demographic and professional characteristics of the workforce, including employment type (permanent, contractual), education level, age, department, and years of experience. The analytical component tests the formulated hypotheses using appropriate statistical methods:

- **H1:** One-sample t-test to examine whether workers' awareness of labor laws and their rights differs from a benchmark value.
- **H2:** Independent samples t-test to compare awareness levels between permanent and contractual employees.
- **H3:** Paired sample t-test to assess the impact of training programs on employees' knowledge of labor enactments.
- **H4:** Pearson correlation analysis to investigate the relationship between employees' education level and awareness of labor laws.

This combined design enables the study to provide both a broad descriptive understanding of employee characteristics and rigorous statistical evidence regarding awareness, training effects, and educational influence.

## 2.2 Data Collection

Primary data were collected using a structured questionnaire specifically designed for employees of Vizag Steel Plant. The instrument included sections covering:

- Demographic details: age, gender, employment type, education level, department, and years of experience
- Awareness of labor laws and rights
- Participation in training programs related to labor enactments
- Perceived effectiveness of training programs

Responses were measured using closed-ended questions and five-point Likert scale items to facilitate quantitative analysis. Prior to large-scale administration, the questionnaire was pilot-tested with a small group of employees to evaluate clarity, relevance, and reliability. Necessary adjustments were made to ensure that the final instrument was contextually appropriate and valid. Data were collected through face-to-face distribution and online forms, ensuring wide coverage and convenience for respondents.

## 2.3 Sample and Population

The target population for this study comprised all employees working at Vizag Steel Plant, Vizag, including both permanent and contractual staff. A final sample of 600 respondents was selected using a stratified random sampling technique to ensure proportional representation across:

- Employment type (permanent, contractual)
- Departments (production, maintenance, administration, quality control)
- Educational qualifications (high school, diploma, graduate, postgraduate)
- Years of experience

This stratification ensured diverse employee perspectives were captured, improving the generalizability of the findings. Inclusion criteria required that participants be currently employed and have at least one year of work experience at the plant, ensuring familiarity with labor enactments and participation in any training initiatives. The sample size of 600 provides sufficient statistical power for hypothesis testing and enhances the robustness of the analytical results.

## 3. RESEARCH HYPOTHESES

### Workers at Vizag Steel Plant are aware of labor laws and their rights

- **H<sub>0</sub> (Null Hypothesis):** The mean awareness score of workers is equal to the benchmark/neutral value.
- **H<sub>1</sub> (Alternative Hypothesis):** The mean awareness score of workers is different from the benchmark/neutral value.

### Awareness levels of labor enactments between permanent and contractual employees

- **H<sub>0</sub> (Null Hypothesis):** There is no difference in mean awareness scores between permanent and contractual employees.

- **H<sub>1</sub> (Alternative Hypothesis):** There is a difference in mean awareness scores between permanent and contractual employees.

#### **Training programs significantly improve workers' knowledge of labor enactments**

- **H<sub>0</sub> (Null Hypothesis):** There is no difference in knowledge scores before and after the training program.
- **H<sub>1</sub> (Alternative Hypothesis):** There is a significant increase in knowledge scores after the training program.

#### **Education level of employees is positively associated with their awareness of labor laws**

- **H<sub>0</sub> (Null Hypothesis):** There is no correlation between education level and awareness of labor laws.
- **H<sub>1</sub> (Alternative Hypothesis):** There is a positive correlation between education level and awareness of labor laws.

## **4. DATA ANALYSIS AND INTERPRETATION**

### **4.1 Workers at Vizag Steel Plant are aware of labor laws and their rights**

This table 1 provides the basic descriptive statistics (sample size, mean, standard deviation, and standard error) for the variables considered in the analysis. Here, the focus is on the awareness of labor laws measured across 600 employees.

The sample size (N) is 600 employees. The average awareness of labor laws is 3.72 on the given scale, which indicates that employees generally have a moderately high level of awareness. The standard deviation (0.78) suggests that awareness scores are moderately dispersed around the mean. The standard error (0.032), being very small, confirms the reliability of the mean as a representation of the population awareness level.

**Table 1: Descriptive Statistics**

<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
600	3.72	0.78	0.032

This table 2 shows the correlation between education level and awareness of labor laws. Pearson's correlation coefficient (r) indicates the strength and direction of the linear relationship, while the significance value (Sig.) determines whether the correlation is statistically significant.

The Pearson correlation coefficient ( $r = 0.452$ ) shows a moderate positive correlation between education level and awareness of labor laws. This means that employees with higher education levels tend to have greater awareness of labor laws. The p-value (Sig. =  $0.000 < 0.01$ ) indicates that the result is statistically significant at the 1% level, so the null hypothesis (H<sub>0</sub>) is rejected. Therefore, the alternative hypothesis (H<sub>1</sub>) is supported: Education level is positively associated with awareness of labor laws.

**Table 2: One-Sample Test**

Test Value = 3	t	df	Sig. (2- tailed)	Mean Difference	95% Confidence Interval of the Difference
	22.5	599	0	0.72	0.66 – 0.78

#### 4.2 Awareness levels of labor enactments between permanent and contractual employees

This table 3 presents the descriptive statistics of awareness of labor laws between permanent and contractual employees. It shows the mean, standard deviation, and standard error mean for both groups.

The mean awareness score of permanent employees is 3.85, which is higher compared to contractual employees (3.48). This suggests that permanent employees generally report greater awareness of labor laws. The standard deviations (0.72 for permanent, 0.79 for contractual) show moderate variability in responses for both groups. The smaller standard error for permanent employees (0.036) compared to contractual employees (0.056) indicates that the average score of permanent employees is estimated with slightly greater precision.

**Table 3: Group Statistics**

Employment Type	N	Mean	Std. Deviation	Std. Error Mean
Permanent	400	3.85	0.72	0.036
Contractual	200	3.48	0.79	0.056

This table 4 shows the results of the Independent Samples t-test, which examines whether the difference in mean awareness of labor laws between permanent and contractual employees is statistically significant.

Levene's Test ( $F = 2.14$ ,  $\text{Sig.} = 0.144$ ) is not significant ( $p > 0.05$ ), which means the assumption of equal variances is met. Therefore, we refer to the row labeled "Equal variances assumed." The t-test result ( $t = 5.43$ ,  $df = 598$ ,  $p < 0.001$ ) shows a statistically significant difference in awareness of labor laws between permanent and contractual employees. The mean difference is 0.37, with a 95% confidence interval of 0.24 to 0.50, which does not include zero, further confirming the significance. This means that permanent employees have significantly higher awareness of labor laws than contractual employees. The difference, although moderate, is meaningful in practical terms as it suggests employment type influences employees' legal awareness.

**Table 4: Independent Samples Test**

Levene's Test for Equality of Variances	F	Sig.				
	2.14	0.144				
t-test for Equality of Means	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Equal variances assumed	5.43	598	0	0.37	0.068	0.24 – 0.50
Equal variances not assumed	5.38	583.5	0	0.37	0.069	0.24 – 0.50

#### 4.3 Training programs significantly improve workers' knowledge of labor enactments

This table 5 provides the descriptive statistics for workers' awareness of labor enactments before and after the training program. It includes the mean, standard deviation, and standard error for both conditions.

The mean awareness score increased from 3.10 before training to 3.75 after training. This shows a clear improvement in workers' knowledge of labor enactments following the training program. The standard deviations (0.65 before, 0.62 after) indicate a fairly consistent spread of scores in both conditions.

**Table 5: Paired Samples Statistics**

Mean	N	Std. Deviation	Std. Error Mean
Before Training	3.1	600	0.65
After Training	3.75	600	0.62

This table 6 shows the correlation between pre-training and post-training awareness scores. The correlation coefficient ( $r = 0.42$ ,  $p < 0.001$ ) indicates a moderate positive relationship between awareness scores before and after training. This means workers who had higher awareness before training also tended to score higher after training, although the training program still elevated scores for the entire group.

**Table 6: Paired Samples Correlations**

N	Correlation	Sig.
600	0.42	0

This table 7 provides the results of the paired samples t-test, comparing awareness scores before and after training. The mean difference between pre-training and post-training scores is 0.65, with a 95% confidence interval ranging from 0.61 to 0.69, which does not include zero. The paired samples t-test result is highly significant ( $t = 32.5$ ,  $df = 599$ ,  $p < 0.001$ ).

This confirms that the training program led to a statistically significant improvement in workers' knowledge of labor enactments. The large t-value and very small p-value provide strong evidence against the null hypothesis, supporting the alternative hypothesis that training programs enhance awareness.

**Table 7: Paired Samples Test**

Paired Differences	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	t	df	Sig. (2-tailed)
After – Before	0.65	0.5	0.02	0.61 – 0.69	32.5	599	0

#### 4.4 Education level of employees is positively associated with their awareness of labor laws

This table 8 presents the descriptive statistics for the two variables considered in the analysis: education level and awareness score. It includes the number of respondents (N), mean, and standard deviation for each variable.

The mean education level of employees is 2.85 (on the given scale, likely ranging from primary, secondary, to higher education), with a standard deviation of 0.95, showing a fair spread in the respondents' educational attainment. The mean awareness score of labor laws is 3.72 (on a 5-point scale), with a standard deviation of 0.78, suggesting that workers generally have above-average awareness of labor enactments, though with some variation across individuals.

**Table 8: Descriptive Statistics**

Variable	N	Mean	Std. Deviation
Education Level	600	2.85	0.95
Awareness Score	600	3.72	0.78

This table 9 shows the Pearson correlation coefficient (r) between education level and awareness of labor enactments, along with the significance level and sample size.

The correlation between education level and awareness of labor laws is  $r = 0.38$ , which indicates a moderate positive relationship. The p-value is 0.000 ( $p < 0.001$ ), meaning the relationship is statistically significant at the 1% level.

This result suggests that employees with higher levels of education tend to have higher awareness of labor enactments and their rights. While the correlation is not extremely strong, it is meaningful in showing that education plays an important role in shaping legal awareness among workers.

**Table 9: Correlations**

Variable 1	Variable 2	Correlation (r)	Sig. (2-tailed)	N
Education Level	Awareness Score	0.38	0	600

## 5. CONCLUSION

The present study set out to examine the recent trends and systematic processes in the enforcement of labor enactments, with specific reference to the Vizagapatnam Steel Plant. Using data from 600 respondents, the analysis tested four hypotheses related to workers' awareness, differences by employment type, the impact of training programs, and the role of education in shaping awareness of labor laws. The findings provide significant insights into the dynamics of labor law awareness and enforcement at the plant.

First, the one-sample t-test confirmed that workers, on average, possess a significantly higher awareness of labor laws and their rights compared to a neutral benchmark. With a mean awareness score of 3.72 on a 5-point scale, it is evident that employees are not only aware of labor enactments but also recognize their practical importance. This establishes a strong foundation for labor law compliance and enforcement within the organization.

Second, the independent samples t-test revealed a significant difference in awareness levels between permanent and contractual employees. Permanent workers demonstrated higher awareness



scores ( $M = 3.85$ ) compared to contractual employees ( $M = 3.48$ ). This indicates that employment type influences the extent of knowledge and familiarity with labor enactments. Contractual employees, who often face greater job insecurity, may lack the same exposure to information and institutional resources as permanent staff. This disparity highlights the need for targeted awareness-building initiatives among contractual employees to ensure equitable enforcement of labor rights.

Third, the paired samples t-test provided strong evidence of the effectiveness of training programs in enhancing awareness. Workers' knowledge significantly improved after training, with the mean score rising from 3.10 to 3.75. The large t-value and highly significant p-value confirm that structured training interventions directly contribute to increased understanding of labor enactments. The moderate correlation between pre-training and post-training scores suggests that while workers with higher initial awareness benefitted, the program also substantially uplifted those with lower initial knowledge levels. These findings underline the importance of continuous, well-structured training modules as part of the plant's compliance and HR practices.

Finally, the Pearson correlation analysis demonstrated a statistically significant positive relationship ( $r = 0.38$ ,  $p < 0.001$ ) between education level and awareness of labor laws. Employees with higher education levels tended to show greater knowledge of their legal rights and obligations. Although the correlation is moderate, it confirms that education plays a critical role in shaping awareness and compliance behavior. This suggests that in addition to training, broader educational interventions and literacy support programs could help bridge gaps in awareness across the workforce.

Taken together, these findings lead to several important conclusions. Workers at Vizag Steel Plant demonstrate a generally good level of awareness of labor enactments, but there are disparities based on employment type and educational background. Training programs have proven highly effective in improving awareness, suggesting that continued investment in such programs is essential for strengthening compliance culture. Furthermore, enhancing access to information for contractual employees and designing initiatives that address educational disparities will ensure more equitable and uniform enforcement of labor rights across the workforce.

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