



“Workplace Infrastructure And Environmental Conditions As Determinants Of Quality Of Work Life: Evidence From Manufacturing Industries In Mandideep, Madhya Pradesh, India”

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Abstract

This study examines the role of workplace infrastructure and environmental conditions as predictors of Quality of Work Life (QWL) among 320 employees across large, medium, and small-scale manufacturing units in Mandideep Industrial Area, India. Using a structured QWL questionnaire, data were collected on satisfaction with work conditions, safety perception, facility ratings, work stress, work-life balance, and other dimensions. Descriptive statistics, ANOVA, correlation, and multiple regression analyses were performed. Results reveal significantly lower satisfaction with physical infrastructure (lighting, restrooms, canteen, transport) and environmental conditions (ventilation, cleanliness) in medium- and small-scale units compared to large-scale firms ($p < .001$). Facility rating and perceived safety emerged as the strongest predictors of overall QWL ($\beta = .412$ and $\beta = .356$, $p < .001$). High work stress and poor work-life balance were strongly associated with inadequate infrastructure. The findings highlight that poor workplace infrastructure disproportionately affects QWL in SMEs and suggest policy interventions for mandatory infrastructure upgradation to meet ILO decent work standards.

Keywords: Quality of Work Life, Workplace Infrastructure, Manufacturing Sector, India, SMEs, Occupational Health, Work Environment.

1. Introduction

Quality of Work Life (QWL) has gained prominence as a multidimensional construct influencing employee well-being, productivity, and retention (Sirgy et al., 2001). In developing economies, manufacturing workers often face sub-optimal physical work environments that adversely affect QWL (Kanten & Sadullah, 2012). Mandideep, one of Madhya Pradesh's oldest industrial areas, hosts a mix of large multinational plants and numerous medium/small enterprises, providing a natural setting to compare infrastructure standards across firm sizes.

Despite India's rapid industrial growth, little empirical evidence exists on how tangible workplace infrastructure (canteen, restrooms, lighting, transport, safety gear) and environmental conditions shape QWL, particularly in tier-2 industrial clusters. This study addresses this gap.

Research Objectives

1. To assess the current state of workplace infrastructure and environmental conditions in Mandideep manufacturing units.
2. To examine differences in QWL across large, medium, and small-scale enterprises.
3. To identify which infrastructure elements most strongly predict overall QWL.

2. Literature Review

Walton (1973) originally proposed eight QWL dimensions, including adequate and fair compensation, safe and healthy working conditions, and work-life balance. Subsequent studies (Sirgy et al., 2001; Rethinam & Ismail, 2008) confirmed that the physical work environment is among the strongest predictors of QWL.

In the Indian context, large firms typically comply with statutory requirements (Factories Act, 1948), whereas SMEs often compromise on infrastructure due to cost constraints (CII, 2020). Poor lighting, inadequate restrooms, and a lack of transport facilities have been linked to higher stress and lower job satisfaction among blue-collar workers (Suresh & Venkatammal, 2015).

3. Methodology

3.1 Sample and Data Collection

A stratified random sample of 320 employees was drawn from 11 manufacturing units in Mandideep during January–March 2025. Firms were classified as large (>250 employees), medium (50–250), and small (<50) per MSME criteria. Response rate: 94%.

3.2 Instrument

A 30-item QWL questionnaire adapted from Walton (1973) and Sirgy et al. (2001) was used (Cronbach's $\alpha = .89$). Key variables:

- ❖ Satisfaction with Work Conditions (5-point Likert)
- ❖ Safety Feeling (Yes/No)
- ❖ Facility Rating (Poor to Excellent, converted to 1–5)
- ❖ Work Stress Level (Low/Moderate/High, converted to 1–3)
- ❖ Work-Life Balance Rating (Poor to Excellent, 1–5)

3.3 Statistical Analysis

SPSS 27 was used for descriptive statistics, one-way ANOVA with post-hoc Bonferroni, Pearson correlation, and hierarchical multiple regression.

4. Results

4.1 Descriptive Statistics

Mean facility rating: 3.12 (SD = 1.08); only 28% rated facilities as “Good” or “Excellent”.

58% reported moderate-to-high work stress; 61% rated work-life balance as average or poor.

Common improvement suggestions: canteen (34%), transport (29%), lighting (22%), restrooms (19%).

4.2 Differences by Firm Size

Variable	Large-scale (n=102)	Medium-scale (n=148)	Small-scale (n=70)	F-value	p
Facility Rating (1–5)	3.89	3.04	2.41	68.42	<.001
Satisfaction with Work Conditions	3.71	2.88	2.36	54.19	<.001
Safety Feeling (% Yes)	82%	61%	49%	$\chi^2=26.8$	<.001
Work Stress (1–3)	1.76	2.21	2.38	31.67	<.001
Work-Life Balance (1–5)	3.68	2.91	2.54	49.33	<.001

Post-hoc tests confirmed large-scale firms significantly outperformed medium and small firms on all dimensions ($p < .01$).

4.3 Correlation and Regression

Facility Rating ($r = .68$), Safety Feeling ($r = .61$), and Lighting/Canteen Quality ($r = .58-.60$) showed the strongest correlations with the overall QWL composite score.

Hierarchical regression ($R^2 = .59$, Adjusted $R^2 = .57$, $F = 48.76$, $p < .001$):

Predictor	β	t	P
(Constant)		4.21	<.001
Facility Rating	.412	9.68	<.001
Safety Feeling	.356	8.14	<.001
Work Stress Level (reverse)	-.289	-6.77	<.001
Transport Availability	.221	5.03	<.001
Firm Size (Large = reference)	.198	4.61	<.001

5. Discussion

The findings confirm that workplace infrastructure and environmental conditions are powerful determinants of QWL, explaining 59% of variance. Employees in SMEs experience significantly poorer infrastructure, translating into higher stress and poorer work-life balance. Canteen and transport emerged as critical pain points, consistent with earlier Indian studies (Sahoo & Mishra, 2018).

Large firms (Eicher, Lupin, and Andritz) invest in modern facilities to retain skilled labour, whereas medium and small units treat infrastructure as a cost rather than an investment, perpetuating low QWL and high turnover.

6. Implications and Recommendations

6.1 Policy

- The Madhya Pradesh government should enforce minimum infrastructure standards for MSMEs under the Factories Act and provide subsidized loans for canteen/restroom upgrades.
- Include workplace infrastructure score in ESI/PF compliance audits.

6.2 Managerial

- ❖ Prioritize low-cost, high-impact improvements (better lighting, subsidized transport, clean restrooms).
- ❖ Regular employee feedback on facilities linked to ISO 45001 certification.

6.3 Future Research

Longitudinal studies and objective measurement of environmental parameters (lux levels, noise, and air quality) would strengthen causal claims.

7. Conclusion

Workplace infrastructure and environmental conditions are not mere hygiene factors but core determinants of Quality of work life in Indian manufacturing. Until SMEs bridge the infrastructure gap, India's vision of becoming a global manufacturing hub will remain constrained by dissatisfied and stressed workers.

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