

A Study On The Effectiveness Of Workplace Health And Safety Upon Employee Wellbeing At Sri Vigneshwara Cold Forge

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Abstract: *This research paper explores effectiveness of employee workplace health and safety upon employee wellbeing which includes physical health, mental health, engagement, productivity and job satisfaction. Key variables including training programs, ergonomics measures, safety protocols and organizational support will be examined in relation to employee physical and mental wellbeing indicators such as injury rates, absenteeism, job satisfaction and stress levels. The total population is 200 and sample size is 132. The tools used for non-parametric U test, H test and Spearman Rank Correlation, Chi-square, Weighted average and Interval Estimation. Through a combination of qualitative and quantitative research methods, including surveys, interviews and data analysis, this research aims to suggest suitable health and safety measures for employee wellbeing for Sri Vigneshwara Cold Forge.*

Key words: *Physical Health Impact, Safety Perception, Hazard Identification, Policy Compliance, Training Programs.*

I.INTRODUCTION

WORKPLACE SAFETY PRACTICES:

Workplace safety practices play a crucial role in ensuring the wellbeing of employees. When employees feel safe and protected in their work environment, it positively impacts their overall wellbeing. Implementing effective workplace safety practices not only reduces the risk of accidents and injuries but also contributes to improved physical and

mental health, job satisfaction, and productivity. By prioritizing safety measures such as proper training, hazard identification, and preventive measures, organizations create a supportive and secure work environment. This, in turn, fosters a sense of trust and confidence among employees, leading to increased job satisfaction and reduced stress levels.

When employees feel safe, they are more likely to be engaged and motivated in their work. They can focus on their tasks without worrying about potential hazards, which ultimately enhances their overall wellbeing. Effective safety practices also promote a positive organizational culture, where employees feel valued and cared for, resulting in higher levels of job satisfaction and employee retention.

Effectiveness of workplace safety practices:

Moreover, the effectiveness of workplace safety practices in cold forging extends beyond physical well-being. Clear communication of safety guidelines and regular training sessions not only reduces accidents but also enhances employees' knowledge and confidence in handling machinery and materials. This proactive approach cultivates a culture of awareness, teamwork, and accountability, fostering a positive work environment. Ultimately, the combination of physical and psychological well-being through stringent safety measures contributes to increased productivity, employee morale, and long-term success in the cold forging sector.

Workplace safety practices in cold forging are paramount for ensuring the well-being of employees. This comprehensive approach

encompasses both physical and mental aspects, contributing to a healthier and more productive work environment.

II. REVIEW OF LITERATURE

Daniel Lundqvist, Cathrine Reineholm, Christian Ståhl, Mattias Hellgren (2024), Occupational health and safety management: examining managers' organizational conditions and their impact on employee well-being.

There is extensive knowledge about the significance of the psychosocial work environment for workplace health and well-being. However, there is a need for more understanding regarding how managers' organizational conditions relate to the actual implementation of occupational health and safety management (OHSM) and its effects on employee health. This study aims to investigate the association between managers' organizational conditions and OHSM implementation, and how this impacts the psychosocial work environment and employee well-being. Surveys were conducted among managers and employees in ten different organizations in Sweden, resulting in 1,097 valid responses. Structural equation modeling (SEM) was employed to analyze the collected data, revealing that managers' conditions influenced employee well-being through OHSM and the psychosocial work environment.

Tetu M Mutegi, Paul M Joshua, Jesse K Maina (2023), Workplace safety, Employee safety attitudes, and employee productivity in manufacturing firms.

Despite the implementation of safety programs and laws in the manufacturing sector in Kenya, there are ongoing challenges with employee safety attitudes impacting workplace safety and productivity. This study explores the intervening role of workplace safety attitudes on the relationship between workplace safety and employee productivity in Kenyan manufacturing

firms. Using a sample of 124 firms across 14 subsectors, regression analysis highlighted the significant mediating effect of workplace safety attitudes on this relationship. Improving employee safety attitudes is crucial for enhancing workplace safety and productivity in manufacturing settings.

Metin Bayram, Bulent Arpat, Yilmaz Ozkan (2022), Influence of safety priority, rules, and participation on safety behavior.

This study investigates how employee perceptions of management's safety priorities, rules, and training influence safety participation and behavior in the metal sector. Surveying 822 employees, statistical analyses revealed direct positive effects of safety priority on rules and training, rules on training, and training on participation and behavior. Additionally, safety training mediated relationships between safety priority/rules and participation/behavior. Management's emphasis on safety, coupled with comprehensive training, fosters a safer workplace and employee engagement in safety practices.

Ajmal, NAS Isha, MS Nordin, Jinnah Bus (2021), Safety management practices and occupational health and safety performance.

This paper reviews existing literature on safety management practices and their impact on occupational health and safety performance. Findings emphasize the importance of safety management practices such as management commitment, safety rules, procedures, and training in enhancing safety performance across various industries and countries. Quantitative approaches dominate the literature, highlighting areas for future research and the need for holistic safety management models to mitigate workplace risks effectively.

Severine SA Kessy, Rutasimbala Raymond (2021), The Role of Occupational Health and Safety Management Systems in Tanzania's Manufacturing Industries.

Workplace hazards are a growing concern in Tanzanian manufacturing. This study assesses the roles of occupational health and safety management systems (OHSMS) in mitigating workplace hazards. Through surveys with 285 respondents from major manufacturing companies, the study highlights the crucial role of effective OHS guidelines, programs, and administration in reducing accidents, injuries, damages, and work-related diseases. Recommendations include prioritizing and implementing robust OHSMS to ensure workplace safety.

Shadrach OMOFOWA, Rita AKHIDUE-OGOGO, Chijioke NWACHUKWU, LAM Trung (2021), Best Practices for Workplace Health and Safety: Organizational Culture's Mediating Role.

This study examines best practices for ensuring workplace health and safety and their relationship with organizational culture at a glass manufacturing company in Nigeria. Findings underscore the positive impacts of training, leadership quality, and safe work procedures on employee health and safety. Moreover, organizational culture significantly mediates these relationships, highlighting the importance of a supportive culture in promoting workplace safety and employee well-being.

Kassu Jilcha, Daniel Kitaw (2020), Understanding Global Occupational Safety and Health Practices & Accident Severity.

This literature review identifies gaps in global occupational safety and health management, emphasizing the need for future research areas. The review integrates findings from various studies, highlighting challenges such as operational hazards, environmental factors, and knowledge transfer gaps. Recommendations include developing comprehensive safety

management models to reduce workplace risks effectively.

Paige M Hulls, Rebecca C Richmond (2020), Evaluating Workplace Interventions for Employee Health and Wellbeing.

This systematic review assesses workplace interventions targeting employee health and well-being in male-dominated industries. It includes randomized controlled trials and non-randomized intervention studies, aiming to improve physical and mental health in the workplace. The review prioritizes effective interventions based on their impact, offering valuable insights for future implementation.

Paige M Hulls, Rebecca C Richmond (2020), Impact of Safety Culture and Climate on Safety Performance.

Exploring the influence of safety culture and climate on safety performance is crucial for manufacturing enterprises. This study conducted in the Ethiopian manufacturing sector highlights the significant impact of safety culture and climate on safety performance. Employee engagement plays a crucial mediating role in this relationship, underscoring the importance of fostering a positive safety culture and climate for improved safety outcomes.

III. NEED FOR THE STUDY

1. Evaluate the current workplace safety policies and procedures within the cold forge industry.
2. Investigate workplace accidents and injuries, aiming to reduce absenteeism and boost productivity.
3. Assess how workplace safety practices influence employee wellbeing.
4. Explore effective strategies for improving workplace safety practices and promoting employee wellbeing in the cold forge industry.

5. Analyze how workplace practices affect employee morale and job satisfaction.

and draw meaningful conclusions from the collected data among employees.

IV.OBJECTIVES OF THE STUDY

Primary objective:

1. To study the effectiveness of workplace health and safety practices upon employee wellbeing at Sri Vigneshwara Cold Forge.

Secondary objectives:

2. To examine the correlation between workplace health & safety practices and employee job satisfaction at Sri Vigneshwara Cold Forge.
3. To identify the key factors that contribute to workplace accidents and injuries at Sri Vigneshwara Cold Forge.
4. To evaluate the effectiveness of current health & safety policies, procedures and identify areas of improvement.
5. To evaluate the effectiveness of safety training programs in promoting employee job satisfaction.

V. RESEARCH METHODOLOGY

RESEARCH DESIGN:

The research design used for this study is descriptive study. Descriptive study is a facts finding investigation with an adequate interpretation. It is the simplest type of research and is more specific.

SIMPLE RANDOM SAMPLING:

For this study Simple Random Sampling is used. Simple random sampling offers researchers an opportunity to perform data analysis and a way that creates a lower margin of error within the information collected.

STATISTICAL TOOLS USED:

The research employed a variety of statistical tools, including Mann Whitney U-test, Kruskal Wallis H-test, CHI Square and Weighted average to analyze

NOMALITY TEST

Null Hypothesis (Ho): The data follows normal distribution

Alternative Hypothesis (H1): The data significantly deviates from normal distribution

| Tests Of Normality | | | | | | |
|------------------------|----------------------------------|-----|----------|-----------------------|-----|------|
| | Kolmogorov -Smirnov ^a | | | Shapiro-Wilk | | |
| | St ati sti c | Df | Si g. | St ati sti c | Df | Sig |
| Physical Health Impact | .183 | 132 | .000 | .918 | 132 | .000 |
| Safety Perception | .217 | 132 | .000 | .858 | 132 | .000 |
| | | | | | | |
| Hazard Identification | .150 | 132 | .000 | .917 | 132 | .000 |

| | | | | | | |
|---------------------------------------|------|-----|------|------|-----|------|
| Policy Compliance | .28 | 132 | .000 | .835 | 132 | .000 |
| Training Programs | .183 | 132 | .000 | .885 | 132 | .000 |
| A. Lilliefors Significance Correction | | | | | | |

| | Gender | N | Mean Rank | Sum Of Ranks |
|------------------------|--------|----|-----------|--------------|
| Physical Health Impact | Female | 35 | 43.87 | 1535.5 |
| | Male | 97 | 74.66 | 7242.5 |
| Safety Perception | Female | 35 | 39.9 | 1396.5 |
| | Male | 97 | 76.1 | 7381.5 |
| Hazard Identification | Female | 35 | 64.64 | 2262.5 |
| | Male | 97 | 67.17 | 6515.5 |
| Policy Compliance | Female | 35 | 43.09 | 1508 |
| | Male | 97 | 74.95 | 7270 |
| Training Programs | Female | 35 | 46.76 | 1636.5 |
| | Male | 97 | 73.62 | 7141.5 |

INTERPRETATION:

From the results of Kolmogorov – Smirnov test, Since **P (sig) value < 0.05**, we reject Null Hypothesis. It infers that the data is significantly deviated from Normal distribution. Hence, non-parametric tools are applied for the study.

MANN WHITNEY U -TEST

Null Hypothesis (Ho): There is no significant difference between the mean rank of Female and Male with respect to physical health impact, Safety perception, Hazard identification, Policy compliance and Training programs.

Alternative Hypothesis (H1): There is significant difference between the mean rank of Female and Male with respect to physical health impact, Safety perception, Hazard identification, Policy compliance and Training programs.

| | | Test Statistics(A) | | | |
|--|------------------------|--------------------|-----------------------|-------------------|-------------------|
| | Physical Health Impact | Safety Perception | Hazard Identification | Policy Compliance | Training Programs |

| | | | | | |
|------------------------|--------|--------|--------|--------|--------|
| Mann-Whitney U | 905.5 | 766.5 | 1632.5 | 878 | 1006.5 |
| Wilcoxon W | 1535.5 | 1396.5 | 2262.5 | 1508 | 1636.5 |
| Z | -4.098 | -4.819 | -0.336 | -4.335 | -3.578 |
| Asymp. Sig. (2-Tailed) | 0 | 0 | 0.737 | 0 | 0 |

INFERENCE:

Male has high reliability in physical health impact, safety perception, hazard identification, policy compliance and training programs when compared to the mean rank of Female

(43.87 < 74.66), (39.9 < 76.1), (64.64 < 67.17), (43.09 < 74.95), (46.76 < 73.62).

Safety perception, Hazard identification, Policy compliance and Training programs.

KRUSKAL WALLIS H – TEST:

(AGE)

Null Hypothesis (Ho): There is no significant difference among the mean rank of Age with respect to physical health impact, Safety perception, Hazard identification, Policy compliance and Training programs.

Alternative Hypothesis (H1): There is significant difference among the mean rank of Age with respect to physical health impact,

| | RANKS | | |
|------------------------|----------|----|-----------|
| | AGE | N | MEAN RANK |
| PHYSICAL HEALTH IMPACT | 20-25 | 41 | 42.02 |
| | 25-30 | 83 | 80.77 |
| | Above 30 | 8 | 43.94 |
| SAFETY PERCEPTION | 20-25 | 41 | 38.7 |

| | | | |
|-----------------------|----------|----|-------|
| | 25-30 | 83 | 82.18 |
| | Above 30 | 8 | 46.31 |
| HAZARD IDENTIFICATION | 20-25 | 41 | 71.94 |
| | 25-30 | 83 | 61.69 |
| | Above 30 | 8 | 88.56 |
| POLICY COMPLIANCE | 20-25 | 41 | 33.49 |
| | 25-30 | 83 | 83.98 |
| | Above 30 | 8 | 54.31 |
| TRAINING PROGRAMS | 20-25 | 41 | 44.94 |
| | 25-30 | 83 | 78.93 |
| | Above 30 | 8 | 48.06 |

Inference:

This indicates that Age may not play a substantial role in influencing perception or abilities related to Hazard Identification.

CHI-SQUARE:

Null Hypothesis (Ho): There is no dependency between gender and education.

Alternative Hypothesis (H1): There is dependency between gender and education.

| Gender * Education Qualification Crosstabulation | | | | | | | | |
|--|--------|-------|------|------|---------|----|----|-------|
| Education Qualification | | | | | | | | Total |
| | | | 10th | 12th | Diploma | UG | PG | |
| Gender | Female | Count | 2 | 5 | 2 | 7 | 19 | 35 |

| | | | | | | | | |
|-------|------|----------------|----------------|-----------|---------------|---------------|---------------|-----|
| | | Expected Count | 9.01515 152 | 6.0984848 | 5.303030 3 | 8.484848 5 | 6.09848 48 | 35 |
| | Male | Count | 32 | 18 | 18 | 25 | 4 | 97 |
| | | Expected Count | 24.9848 485 | 16.901515 | 14.69697 | 23.51515 2 | 16.9015 15 | 97 |
| | | Count | 34 | 23 | 20 | 32 | 23 | 132 |
| Total | | Expected Count | 34 | 23 | 20 | 32 | 23 | 132 |

| Gender * Education Qualification Crosstabulation | | | | | | | | |
|--|--------|-------------------------|----------------|---------------|---------------|---------------|-----------|-------|
| | | Education Qualification | | | | | | Total |
| | | | 10th | 12th | Diploma | UG | PG | |
| Gender | Female | Count | 2 | 5 | 2 | 7 | 19 | 35 |
| | | Expected Count | 9.0151515 2 | 6.098484 8 | 5.303030 3 | 8.484848 5 | 6.0984848 | 35 |
| | Male | Count | 32 | 18 | 18 | 25 | 4 | 97 |
| | | Expected Count | 24.984848 5 | 16.90151 5 | 14.69697 | 23.51515 2 | 16.901515 | 97 |
| Total | | Count | 34 | 23 | 20 | 32 | 23 | 132 |
| | | Expected Count | 34 | 23 | 20 | 32 | 23 | 132 |

| | Value | Df | Asym. Sign(2 Sided) |
|------------------------------|------------|----|---------------------|
| Pearson Chi-Square | 47.9927412 | 4 | .000 |
| Likelihood Ratio | 45.5160315 | 4 | .000 |
| Linear-By-Linear Association | 28.1329665 | 1 | .000 |
| N Of Valid Cases | 132 | | |

Inference:

This means that gender and education qualification are not independent in this sample, suggesting that there are likely differences in education levels based on gender.

WEIGHTED AVERAGE:

| Factors | 1 | 2 | 3 | 4 | 5 | Weight | Rank |
|---|----------|----------|----------|----------|----------|--------|------|
| Weights | 5 | 4 | 3 | 2 | 1 | | |
| Healthier and more inclusive culture | 27 | 9 | 15 | 16 | 65 | 20.8 | 2 |
| Better job satisfaction | 20 | 20 | 14 | 28 | 50 | 21.8 | 1 |
| More comfortable and relaxed at the workplace | 10 | 15 | 27 | 34 | 46 | 20.3 | 3 |
| Less absenteeism | 12 | 13 | 20 | 35 | 52 | 19.6 | 4 |
| Better mental health | 9 | 8 | 18 | 30 | 67 | 17.2 | 5 |

Healthier and more inclusive culture:

$$\begin{aligned} \text{Weighted average} &= (27 * 5) + (9 * 4) + (15 * 3) + \\ &+ (16 * 2) + (65 * 1) / (1+2+3+4+5) \\ &= 313/15 \\ &\approx 20.8 \end{aligned}$$

Better job satisfaction:

$$\begin{aligned} \text{Weighted average} &= (20 * 5) + (20 * 4) + (14 * 3) + \\ &+ (28 * 2) + (50 * 1) / (1+2+3+4+5) \\ &= 328/15 \\ &\approx 21.8 \end{aligned}$$

More comfortable and relaxed at the workplace:

$$\begin{aligned} \text{Weighted average} &= (10 * 5) + (15 * 4) + (27 * 3) + \\ &+ (34 * 2) + (46 * 1) / (1+2+3+4+5) \\ &= 305/15 \\ &\approx 20.3 \end{aligned}$$

Less absenteeism:

$$\begin{aligned} \text{Weighted average} &= (12 * 5) + (13 * 4) + (20 * 3) + \\ &+ (35 * 2) + (52 * 1) / (1+2+3+4+5) \\ &= 294/15 \\ &\approx 19.6 \end{aligned}$$

Better mental health:

$$\begin{aligned} \text{Weighted average} &= (9 * 5) + (8 * 4) + (18 * 3) + (30 \\ &* 2) + (67 * 1) / (1+2+3+4+5) \\ &= 258/15 \end{aligned}$$

≈17.2

INFERENCE:

It seems that while there are positive aspects to the workplace culture such as better job satisfaction, comfort, and lower absenteeism rates, there is still room for improvement in mental health-related aspects. The weighted average for better mental health is notably lower than other factors, indicating that organizations may need to focus more on initiatives and support systems that promote and maintain good mental health among employees. This could involve implementing mental health resources, destigmatizing conversations around mental health, and creating a supportive and understanding environment for employees facing mental health challenges.

VI. SUGGESTION

Targeted Training Programs:

Develop gender-specific training programs addressing physical health impact, safety perception, policy compliance, and hazard identification to bridge the observed gaps.

Inclusive Safety Culture:

Foster an inclusive safety culture that values input from all genders, ensuring everyone feels equally responsible for workplace safety.

Tailored Training Modules:

Develop age-specific training modules focusing on physical health impact, safety perception, policy compliance, and training programs to address age-related differences effectively.

Mentoring Programs:

Implement mentoring programs where experienced workers guide younger employees on safety practices, emphasizing their importance and ensuring compliance across age groups.

Customized Training Paths:

Offer customized training paths based on education qualifications, emphasizing specific strengths identified in the findings.

Continuous Learning Initiatives:

Encourage continuous learning and upskilling opportunities for employees at all education levels to improve safety perceptions and practices.

Integrated Safety Programs:

Develop integrated safety programs that emphasize the interconnectedness of physical health impact, safety perception, policy compliance, hazard identification, and training programs.

Feedback Mechanisms:

Implement robust feedback mechanisms to gauge safety perceptions regularly, allowing for adjustments and improvements in safety policies and practices.

Comprehensive Mental Health Initiatives:

Develop and promote mental health initiatives, resources, and destigmatization efforts to prioritize and support employees' mental well-being effectively.

Enhanced Safety Equipment Use:

Increase awareness and training on the proper use of safety equipment, particularly for items with lower ratings like earplugs and helmets, to ensure consistent and effective usage across the workplace.

Data Review:

Regularly analyze gender-based education data to monitor trends and identify areas needing attention.

Targeted Programs:

Develop educational initiatives tailored to address gender-specific disparities in education.

Policy Review:

Evaluate existing policies for their effectiveness in promoting gender equity in education and advocate for necessary changes.

Awareness Campaigns:

Launch campaigns to raise awareness about the importance of gender equity in education and garner support for initiatives.

VII. CONCLUSION

The analysis highlights significant variations in workplace health and safety practices across different demographics and correlation patterns. While hazard identification shows no gender or age differences, there are notable disparities in physical health impact, safety perception, policy compliance, and training program effectiveness. Education background also influences strengths in

these areas. Strong correlations exist between physical health impact, safety perception, and training programs, underlining the importance of a robust safety culture. However, mental health aspects and consistent safety item usage need improvement. Addressing these differences through targeted training, fostering continuous learning, integrating safety programs, and promoting mental health initiatives is essential for a safer and healthier work environment for all employees. Regular feedback mechanisms are vital for ongoing improvements in workplace safety practices.

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