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A STUDY ON THE IMPACT OF WORKPLACE SAFETY AND EMPLOYEE PRODUCTIVITY

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ABSTRACT: ***This study investigates the critical link between workplace safety and employee productivity. It examines how a safe work environment fosters a more productive workforce. The research explores various factors that contribute to this positive correlation. These factors may include reduced workplace accidents and injuries, improved employee morale and well-being, increased focus and concentration, and a stronger sense of trust and commitment within the organization. The study also considers potential challenges, such as the perceived time investment in safety protocols versus immediate task completion. Ultimately, the research aims to demonstrate that prioritizing workplace safety is not just an ethical obligation but also a strategic investment that leads to enhanced employee productivity and organizational success.***

Keywords - Workplace safety, Employee productivity, Positive correlation, Employee morale, Well-being, Safety protocols, Strategic investment, Organizational success.

I.INTRODUCTION

Productivity and quality are enhanced by safety. Operations are poorly managed when they are dangerous. Employee turnover will be far higher, and employees won't be motivated or aware. Productivity and quality decrease when employees are overworked, depressed, or incapable of completing their assignments. However, when companies are safe, workers have more time to concentrate on their output and quality. The likelihood of a large-scale disruption occurring less frequently in an organization increases with safety.

Safety and quality are enhanced by productivity. Safety problems are frequently the result of carelessness. Both safety and quality may be enhanced by using the proper (and effective) safety procedures. Employees are less likely to skimp on things like safety procedures if they are more productive. They are more inclined to pay closer attention to the quality of their job when they are more productive.

1.1 Traditional Barriers to Safety, Quality, and Productivity

Dangerous activities result in missed deadlines, hurt workers, and low morale. However, a lot of companies worry that adding more safety procedures might cost money and effort. Although this is true, the time and money are better invested; it is preferable to spend little on preventative treatment than a lot on an emergency. Lastly, there should never be a perception that production and quality are mutually exclusive. Businesses may believe that productivity and safety are incompatible and that juggling more rules and safety procedures makes it hard to run a productive office. Quite the contrary, though; workers cannot continue to be productive in a hazardous workplace.

Creating a Solid Foundation for Your Organization

Safety is the first and most important value that employers should cultivate in their workplace culture. A firm cannot function without safety. Both the caliber of a company's output and staff productivity are always areas for improvement. However, a risky and harmful business can create a bad reputation that will be with it forever. Employers should embrace modern business procedures and business technologies in

addition to corporate culture. By enhancing incident reporting and offering more real-time visibility, safety management software may help businesses make sure that their workers are adhering to stricter safety regulations and that any safety concerns are being appropriately and quickly resolved. Improving an organization from the ground up may be challenging for employers, particularly if it calls for significant or fundamental adjustments. But it's crucial in terms of safety.

Implementation of Safety Measures

Several productivity gains can result from implementing safety precautions in the workplace, including:

- Decreased absenteeism: Workplace safety increases employees' likelihood of being present and involved, which lowers absence rates.
- Enhanced morale among employees: A safe workplace may boost morale among employees, which can result in higher output.
- Less interruptions and distractions: Employees who work in a safe atmosphere are better able to concentrate on their work.
- Improved teamwork: As workers cooperate to recognize and resolve risks, a safety-focused environment may support the development of a collaborative culture.
- Better time management: Employees may prioritize their work and better manage their time when they are not required to continually handle safety problems.

Safe environments minimize lost working hours

In contrast, a factory would need its machinery to operate at maximum efficiency. Employees are required to maintain maximum productivity in any scenario. Injuries will result in lost productivity in any job as companies depend so much on their workforce. Companies that use shortcuts in order to save time and increase output frequently appear successful and productive. These settings may eventually become dangerous as well, increasing downtime. Employee health benefits from safety initiatives and the adoption of safe work practices, even if they frequently involve an upfront expenditure. Healthy workers are beneficial to the bottom line since they are more dependable and productive.

Optimal operating circumstances are frequently correlated with safe working conditions. Employees may concentrate on their work rather than the risks and hazards associated with their jobs when protections are in place. In addition to lowering safety risks, maintaining a cleaner, more organized area may increase productivity. There are further beneficial aspects of occupational safety. Workers are more likely to be engaged and content at work if they take personal responsibility for their safety.
The two sides of the same coin are productivity and safety.
By streamlining their operations, employees at Lockheed Martin's Paducah Plant increased productivity by cutting down on permission paperwork. Although less documentation was required, Lockheed benefited from the new processes that still addressed employee protection.

1.2 STATEMENT OF THE PROBLEM

Workplace Safety and Employee productivity is crucial for the success and competitiveness of engineering-based organizations, particularly those focusing on lathe turning and CNC turning servicing work. However, identifying and addressing the factors that affect Workplace Safety and productivity can be challenging. This study aims to investigate the current level of workplace safety and employee productivity within the organization and explore the factors contributing to or hindering productivity and safety in the workplace. By understanding these factors, the organization can implement strategies to enhance employee performance and achieve better business outcomes.

1.3 OBJECTIVES OF THE STUDY

The objectives of this study are as follows:
1. To assess the current level of Workplace safety and employee productivity
2. To identify the key factors influencing Workplace safety and employee productivity
3. To analyze the impact of Workplace Safety on employee productivity and organizational performance in the industry.

1.4. SCOPE OF THE STUDY

Employee productivity is significantly impacted by workplace health and safety. It has been discovered that workplace safety initiatives, including risk transfer, emergency management, ergonomics, and safety training, have an impact on workers' value-added, productive time, and level of job completion.

1.5 LIMITATION OF THE STUDY

One of the most significant factors to consider while conducting a study is the time limitation.
Since the sample size was randomly chosen, the number of respondents falling under different categories may not be in equal proportion.
The employees may not answer the questions properly because they are busy with work.
The Organization is reluctant to share data/information openly and tends to keep sensitive data/information confidential which is understandable.

II. REVIEW OF LITERATURE

Reese (2018), and the International Safety Rating System Report (2016), have outlined best practices for businesses using safety ergonomics. According to the standards, protective equipment, effects analysis, and danger identification should all be included in practical safety ergonomics. These safety ergonomics measures were used in the current investigation.

Huang and colleagues (2022), and Dessler and Varkkey (2015), Keep in mind that safety ergonomics should incorporate safety audits, robotics, safe working equipment, clean restrooms, and facility design for safety. When ergonomics for workplace safety are implemented effectively, the risk of accidents is reduced, which increases worker productivity. More research is required to have a better understanding of how workplace safety and ergonomics affect employees' productivity.

Leber et al. (2018), examined the impact of ergonomically designed workspaces on worker productivity. Poland, Slovenia, and the United Kingdom were the three nations where the application of safety ergonomics for people with impairments was compared in this study. The study concluded that ergonomics should be used to increase worker productivity and job adoption by employees. However, the study was limited to safety ergonomics for individuals with disabilities. It also failed to look into the real relationship between ergonomics and worker productivity and did not specify which safety ergonomics were adapted for people with disabilities.

Ravindran (2021), investigated how safety ergonomics affected the productivity of workers in a cooperative hospital in India. The research, which was a critical evaluation of the literature, discovered that poor safety ergonomics raises the risk of mistakes, absenteeism, and sick leave, all of which lower worker productivity. The study was criticized for its narrow focus on sanitary ergonomics, for having been designed in a different industry and nation from the one under consideration, and for not producing any novel research results.

Alariki and Al-Abed (2021), focus on how employee performance in Yemen's oil sector is affected by work safety crisis management. The study used crisis preparation and planning as a conceptual framework for workplace emergency management. Due to a lack of impartiality, the idea of employee performance was based on subjective task performance, which may have resulted in biased conclusions. The study discovered a strong correlation between worker performance and emergency workplace management. Employee productivity, disaster preparedness, and workplace safety were all measured more extensively and objectively in the present study.

Bayram (2022), examined the variables influencing worker productivity and safety in a Turkey-based company with OHSAS 18,001 certification. The study measured worker productivity using the capacity to work together more effectively and workplace safety training using safety knowledge. The study discovered a strong correlation between production and safety understanding. Nevertheless, the study did not explore the connection between worker productivity and safety initiatives.

According to the **European Employee Productivity Institute (2019),** the ability of employees to provide the necessary output may be used to gauge their productivity.

Drucker (2002) and Laffont and Martimort (2009), concur that a task's level of completion serves as an objective indicator of worker productivity. The current study used the total number of workers who met their performance goals as stated in their performance contracts or employee dashboards to evaluate task achievement.

According to **Karaboga et al. (2022),** workplace safety through protection and training increases worker productivity and speeds up job adaption.

According to **Henkel et al. (2019),** workplace initiatives may result in behavioral modifications that influence how well workers carry out regular duties.

According to **Kabir et al. (2017),** unfavorable workplace safety occurrences reduce employees' value. Examples include lost workday instances, liability expenses, and restricted responsibilities because of injuries.

III. RESEARCH METHODOLOGY

A research methodology explores the methods and approaches employed in order to locate and evaluate data pertaining to a certain study subject. It's a method by which scientists plan their investigation to enable them to use the chosen research tools to accomplish their goals. It covers every crucial facet of research, such as the overarching framework for the study as well as the methodologies used for data collecting, analysis, and research design.

3.1 RESEARCH DESIGN

The general framework or strategy that directs the course of research is known as a research design. It is an essential step in the research process and acts as a guide for the procedures and methods to be followed during the study, including data collection and analysis.
Surveys and interviews are two examples of qualitative approaches used to investigate the perspectives, experiences, and recommendations of employees about productivity improvement programs. A descriptive study method was chosen for this investigation.

Descriptive Research

The purpose of a descriptive research design is to gather data methodically to characterize a population, circumstance, or phenomenon. More precisely, it assists in providing answers to the research problem of what, when, where, and how inquiries as opposed to its why.
It is noteworthy that, in contrast to experimental research, the researcher does not control or change any factors while using the descriptive research approach. Rather, just the variables are recognized, noted, and quantified.

3.2 RESEARCH TECHNIQUE

The methods and processes that researchers employ to carry out their investigations and collect data are referred to as research techniques. It entails using the right resources at each stage of the research process methodically and logically to accomplish research goals. Depending on the subject of study and the particular research methodology selected, the research technique might change. All things considered, research procedure is vital in helping researchers gather and analyze data and guaranteeing the reliability and validity of their conclusions.
Surveys and interviews are part of the quantitative research methodology used in this study.

3.3 SAMPLING DESIGN

A precise strategy for selecting a sample from a particular population is known as a sampling design. It refers to the method or process the researcher would use to choose the objects for the sample. The sample size, or the number of objects to be included in the sample, may also be determined by the sample design.

Lottery Method of Sampling

One easy-to-understand method of probability sampling is lottery sampling. It guarantees that every individual in the population has an equal opportunity to be chosen. Similar to picking names out of a hat, this kind of sampling works well with small populations or in situations where simplicity is essential.

It's a technique for choosing basic random samples. Through serial numbering starting at 1, 2..., and N, the units in the population were first recognized using this approach. Write these numbers on identical cards or slips that are the same size, shape, and color (if the population consists of N units). Place the cards into a box. Next, shuffle the cards and add them one at a time. If a card is chosen and then replaced between containers after its number is noted, then the units that correspond to the chosen card's number will make up a basic random sampling of size n. After that, the sample was taken using a straightforward random sampling technique where each card was chosen in turn without being replaced in the container before the next one.

3.4 DATA COLLECTION

To support the research question, data collecting entails the methodical gathering of primary and secondary data sources. To get insights into current productivity management techniques and difficulties, interviews are done with important stakeholders within the organization, such as senior management, human resources personnel, and frontline employees.

Online surveys are used to collect quantitative data from a representative sample of employees from various departments and levels within the company. The survey instrument asks questions on how engaged employees are, how productive they think workplace safety programs are, and how they think they will affect organizational performance.

3.5 SAMPLING SIZE

A total of 120 respondents' samples were collected for the study.

3.6 ANALYTICAL TOOLS AND METHODS

- Percentage analysis
- Chi-square
- correlation

IV. ANALYSIS AND INTERPRETATION

4.1 CHI-SQUARE

In statistics, chi-square analysis is used to assess the quality of fit between the actual data distribution and the theoretical distribution that is assumed. As such, it is a metric for analyzing the difference between actual and expected frequencies. Regarding the population being sampled, no assumptions are made about it. The size of the difference between theory and observation is described by the chi-square ($\chi 2$) value. The observed and expected frequencies entirely coincide if $\chi 2$ is zero. The difference between actual and expected frequencies would be larger the higher the value of $\chi 2$. The following formula is used to calculate Chi-Square ($\chi 2$).

$$\chi 2 = \sum (Oi - Ei)2/Ei$$

Oi is the actual frequency, whereas Ei is the expected frequency.
At a certain level of significance, the computed value of $\chi 2$ is compared with the $\chi 2$ table for the given degrees of freedom. It is considered significant when the discrepancy between theory and observation is more than the table value, as indicated by the computed value of $\chi 2$. Conversely, if the computed $\chi 2$ value is smaller than the table value, then the discrepancy between observation and theory cannot be considered statistically significant. (n – 1) is the number of degrees of freedom, where "n" is the number of observed frequencies.

Hypothesis

H_0 - There is no significant relationship between the Gender of the Respondents and Current safety measures in the workplace.

H_1- There is a significant relationship between the Gender of the Respondents and Current safety measures in the work

Table Processing Summary

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.168(a)	5	.147
Likelihood Ratio	9.593	5	.088
Linear-by-Linear Association	4.648	1	.031
N of Valid Cases	120		

4.1 Table showing analysis of Chi-Square

Interpretation

The significance value of Pearson chi-square is .147, which is greater than 0.05. So, the null hypothesis is accepted.
Hence there is no significant relationship between the Gender of the Respondents and Current safety measures in the workplace.

4.2 CORRELATION

The relationship between two or more variables is the main concern of correlation analysis. Regarding the cause-and-effect relationship, it gives no information. Correlation can be categorized or described in several ways. Pearson's coefficient of correlation is the common term used to describe Karl Pearson's approach. The letter "r" stands for it. The Karl Pearson coefficient formula is as follows: $r = \sum XY$,

$$\sqrt{(\sum X2)(\sum Y2)}$$

The coefficient of correlation, as determined by the formula above, will always have a value between +1 and -1. A complete positive correlation between the variables is indicated when r = 1. A complete negative correlation exists between the variables when r = -1. There is no relationship between the variables when r = 0.

Hypothesis

H_0- There is no significant relationship between the age and experience of the employees' safety and productivity.

H_1- There is a significant relationship between the age and experience of the employees' safety and productivity.

Table Processing Summary

		Value	Asymp. Std. Error(a)	Approx. T(b)	Approx. Sig.
Interval by Interval	Pearson's R	.081	.085	.880	.381(c)
Ordinal by Ordinal	Spearman Correlation	.095	.098	1.038	.301(c)
N of Valid Cases		120			

4.2 Table showing analysis of Correlation

Interpretation

The significance value of the Pearson correlation is .381, which is greater than 0.05. So, the null hypothesis is accepted.
Hence, there is no significant relationship between the age of the respondents and the experience of the employees' safety and productivity.

V. FINDINGS

- ➔ 64.6% of respondents are Male.
- ➔ 48.8% of respondents are in the age group of 26-30 years.
- ➔ 70.1% of respondents are unmarried.
- ➔ 37% of respondents have a UG/ Diploma as their educational qualification.
- ➔ 59.8% of respondents said that they are rarely interrupted from their work due to safety incidents.
- ➔ 35.4% of respondents said that they are comfortable in reporting safety concerns to their manager or supervisor.
- ➔ 36.2% of respondents said that the safety protocols and procedures communicated within the team are very effective.
- ➔ 37.8% of respondents said that the current workload and deadlines poorly allow them to prioritize both safety and task completion.
- ➔ 40.1% of respondents agree that safety is the biggest challenge for employees to stay focused and productive at work.
- ➔ 33% of respondents agree that the company promotes a culture of safety within the workplace.
- ➔ 30% of respondents agree that the effective functioning of the machines affects your production.
- ➔ 50% of the respondents agree that the occurrence of errors can be reduced due to the suitability of handling machines.
- ➔ 30% of respondents agree that production could be increased if the machine could be adjusted to one's posture.
- ➔ 45% of the respondents strongly agree that there is enough closeness/gap between the machines that helps them in productivity.
- ➔ 36% of the respondents disagree that heating of machines causes considerable safety issues in the working environment.
- ➔ 45% of the respondents agree that the company provide remedial measures to overcome health issues.
- ➔ 33% of respondents strongly agree that regular maintenance of machines could reduce workplace safety
- ➔ 42% of respondents agree that they have observed various positive impacts of workplace safety programs that help.
- ➔ 55% of respondents agree that workplace design and ergonomics impact both safety and productivity.
- ➔ 44% of the respondents agree that external factors, such as industry regulations and market demands, influence workplace safety and productivity.
- ➔ 45% of respondents were very satisfied with current safety measures.
- ➔ 65% of the respondents were satisfied with the availability and functionality of the safety tools and equipment provided.
- ➔ 40% of the respondents were satisfied with the workplace safety measures and policies.
- ➔ 52% of the respondents were very satisfied with the overall safety measures.

VI. SUGGESTIONS

- Younger workers should be the focus of safety programs because they may be more vulnerable to hazards given their stage of employment.
- Consider any discomfort staff members may have when they voice safety concerns. Establish a culture of candid communication and give safety a priority.
- Improve safety protocols to make sure that everyone on the team understands them easily.
- Ensure that workers have enough work to balance their safety and getting things done right. If necessary, modify the workload or the deadlines.
- Include safety as a primary focus in productivity training. Assist staff in realizing the connection between productivity and safety.
- improve the safety culture of the business and develop initiatives that uphold safety as a fundamental principle.
- Maintenance of machinery and equipment regularly to reduce safety hazards is to be considered.
- Examine ways to make the equipment and workspace arrangement more ergonomic. This may improve productivity and boost efficiency.
- Recognize the external influences that can affect both productivity and safety, such as market needs and industry rules. Include these things in training and safety procedures.
- Address any discrepancies in how satisfied workers are with safety regulations, guidelines, and the culture of safety as a whole. Implement focused interventions to guarantee a constant high degree of satisfaction.

VII. CONCLUSION

This study investigated the relationship between workplace safety and employee productivity. The findings highlight the importance of a strong safety culture and clear communication in fostering a productive work environment.

While a significant portion of the workforce expressed satisfaction with current safety measures, there are areas for improvement. By focusing on targeted initiatives for younger employees, promoting open communication about safety concerns, and integrating safety into productivity training, companies can create a work environment where employees feel empowered to prioritize both safety and efficient task completion. Additionally, investing in preventative maintenance and ergonomic improvements can further enhance safety and potentially increase production.

This research underscores the fact that workplace safety is not just an ethical imperative but also a strategic investment. By prioritizing a safe and healthy work environment, companies can reap the benefits of a more productive and engaged workforce.

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