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Health Hazards and Safety Management in Construction Industry Using Linear Regression Model

Mayuri Bang[1], Pravin Nemade[2]
[1]*Student,* [2]*Professor, M.E (Construction and Management), N.D.M.V.P, College of Engineering, Nashik*

Abstract: ***In construction industry and workplaces, accidents pose significant challenges to survival. This study was carried out with the aims to know the relationship between the safety training and workers behaviour with job performance. A total of 127 responses have been recorded in which 43 responses where from stakeholders and 84 responses from workers of construction sites. To test the validity of the hypothesis and determine its significance by linear regression model, SPSS software was used. Cronbach's alpha coefficient, which was 0.90 and indicates good and consistent, was first used to assess the data's reliability. It concluded that the safety trainings education and workers behaviour have a strong and positive impact on the job performance of workers. The provision of welfare facilities, the provision of personal protective equipment, and worker training on safety procedures are critical measures needed to address occupational safety and health issues confronting workers on building construction sites. The government must demonstrate its political commitment by putting into effect the current legislation and developing occupational safety and health regulations.***

Keywords: Safety, Health, Accidents, SPSS software, Regression

I. INTRODUCTION

The construction industry is one of the key sectors for the growth of the economy, infrastructure, and overall quality of life. However, it is also one of the world's most hazardous work-related industries, with a higher number of work-related accidents that result in fatalities and injuries. Occupational Health and Safety expresses serious concern about this issue, and smaller businesses predominate. Poor working conditions and occupational risks are widespread problems in this sector. Opatha (2009) defines health and safety management as all actions taken to safeguard and advance employees' physical and mental well-being so that they can perform their jobs well. Employee attitudes towards organisations will be negative if employers do not offer enough protection against a variety of risks. Their level of commitment to the organisation will consequently decline. A lot of workers perform worse on the job as a result of stressful workplaces. With that, people did not properly fulfil the demands of their jobs on a daily basis (Fritz & Sonnentag, 2005). Despite the fact that there are laws to address these health and safety issues, their implementation is difficult due to lack of sufficient staff. Smaller businesses bear a heavier burden of occupational injuries, illnesses and fatalities due to lack of resources and assistance with safety and health training programmes. Safety is often given top priority in organisations, but employers are becoming more worried about occupational illnesses. A well-designed Safety Management System should address all safety concerns in this industry, including health issues.

II. OBJECTIVES

Construction sites are dangerous locations where workers are injured or killed. Appropriate procedure and precaution should be followed to improve safety on building projects to reduce loss of life and suffering from illnesses brought on by avoidable accidents. Human life, project economy, and other factors have made the requirement for courteous attention to safety component necessary. The purpose of this thesis is to determine whether safety education training as well as employee behaviour affects job performance of workers

III. LITERATURE REVIEW

(Hudson, 2012) workers who are knowledgeable about the health and safety requirements and guidelines for their job, as well as the equipment they use, are able to work more effectively and efficiently, which leads to improved employee performance

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T. Subramani, R. Lordsonmillar (2014) the poor safety record of the construction industry has caused human and financial losses for the Indian society and economy. Data will be gathered for the study from general contractors who work on important types of construction. By offering contractors a set of suggestions and tactics for enhancing their safety performance, it will come to a close.
Campbell and Wiernik (2015) define performance as "behaviour." Performance can be distinguished from results by something the employee does. A number of variables, including an individual's performance, have an impact on outcomes. The researcher has also made exceptions when defining performance as behaviour. Performance, for instance, need not always manifest itself in clearly visible individual behaviours. It may consist of mental outputs like decisions or responses.
Kalatpour, & Khavaji, (2016) The number of occupational illnesses and accidents affecting the construction industry's workforce and resulting in decreased performance as a result of those effects
Muhamad Muktar and Ezekiel Chinyio, there are poor health and safety practises on Nigerian construction sites (2017). Improvements can be driven by contractors, professional associations, and the government. Accidents can result from a variety of factors, most notably disregarding safety regulations.
Dheeraj Benny, D. Jaishree (2017) poor safety management in the construction industry has caused financial and human losses, particularly in developing nations.
Emma Maano Nghitanwa and Lindiwe Zungu of UNN (2017) suggested creating useful guidelines to enhance occupational health and safety in the Windhoek construction sector.
Nariman Ghodratia, et.al (2018) the number of companies in liable earning classifications was used to predict the safety outcome at a macro level in the construction industry. Total gross earnings paid to employees are referred to as liable earning. The study used information from the Canterbury rebuild database maintained by New Zealand's Accident Compensation Corporation.
Kavya.K, T. Pradeep (2019) when comparing all countries, the construction industry is the one that is developing the fastest on a daily basis. Accidents on construction sites are unavoidable when there are poor organisational arrangements, risky behaviours, and unreliable development workforce attitudes. To avoid accidents, workers must be aware of the risks and safety measures.

IV. RESEARCH HYPOTHESIS

(H0): Safety training and education do not affect the job performance of workers.
(H1): Safety training and education do affect the job performance of workers.
(H0): Worker's behaviour and attitude do not impact the job performance of workers.
(H2): Workers safe behaviour and attitude do impact the job performance of workers.

V. RESEARCH METHODOLOGY

In this study, both qualitative and quantitative methodologies were used in this investigation. Interviews and questionnaire surveys were conducted to collect the necessary data. A total of 127 responses were received, including 84 from construction site workers (daily labourers, masons, carpenters, chisellers, plasterers, welders/electricians, and others) and 43 from stakeholders (supervisor, contractor, project manager, and construction). In order to test the hypothesis, a linear regression model is used. It aims at assessing the strength of the relationship between two or more variables. Data analysis was done using SPSS (Statistical Packages for Social Science Version 27) software. The reliability of the data was initially evaluated using Cronbach's alpha, which was 0.90, indicating good and consistent.

VI. ANALYSIS AND DISCUSSION

(H0): Safety training and education do not affect the job performance.
(H1): Safety training and education do affect the job performance.

Table I
REGRESSION RESULT (H_1)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.591[a]	.350	.334	1.089
a. Dependent Variable: Job Performance				

The R-value is a measurement of the correlation between the dependent and independent variables. As shown in table I, the value is 0.591, which is favorable. R-square denotes the percentage of a dependent variable's variance that is explained by an independent variable. The value in this case is 0.350 which means that independent variable causes 35% change in the dependent variable.

Table II
ANOVA RESULT FOR (H_1)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.164	1	26.164	22.060	.000
	Residual	48.627	41	1.186		
	Total	74.791	42			
a. Dependent Variable: Job Performance						

P-value/Sig value is set at the 5% level or the 95% confidence interval. Consequently, the p-value must be lower than 0.05. It is .000 in the table above. The outcome is significant as a result. F-ratio shows an improvement in the variable's prediction when the model is fitted. The value in the table above is 22.060, which is favourable i.e. (F (1,41) =22.060, $p < 0.005$) is significant.

Table III
COEFFICIENT RESULT FOR (H_1)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.110	.422		2.632	.012
	CSH2	.647	.138	.591	4.697	.000
a. Dependent Variable: Job Performance						

The only value that matters during the interpretation process is the signature value. The value should be less than the study's acceptable level of significance, i.e less than 0.05 for the 95% confidence interval. The validity of the hypothesis is determined by the significant value. The table III shows beta value is 0.591, the beta value is positive and as the p-value is less than 0.005 we reject the null hypothesis and accept the alternative hypothesis. This shows Safety Training and Education of workers have a great strong impact on the job performance of workers.

Similarly for Hypothesis 2,
(H0): Worker's behaviour and attitude do not impact the job performance.
(H2): Worker's safe behaviour and attitude do impact the job performance.

Table IV
REGRESSION RESULT FOR (H_2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.506[a]	.256	.238	1.047
a. Dependent Variable: RF2				

As shown in table IV, the R- value is 0.506, which is favorable. The value of R- Square in this case is 0.256 which means that independent variable causes 26% change in the dependent variable.

Table V
ANOVA RESULT FOR (H_2)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.463	1	15.463	14.102	.001
	Residual	44.956	41	1.096		
	Total	60.419	42			
a. Dependent Variable: Job Performance						

The p-value must be lower than 0.05. It is .001 in the table above. The outcome is significant as a result. The value of F- Ratio in the table above is 14.102, which is favourable i.e. (F (1,41) =14.102, $p < 0.005$) is significant.

Table VI
COEFFICIENT RESULT FOR (H_2)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.527	.395		3.865	.000
	CSH14	.482	.128	.506	3.755	.001
a. Dependent Variable: Job Performance						

The table VI shows that beta value is 0.506, the beta value is positive and as the p-value is less than 0.005 we reject the null hypothesis and accept the alternative hypothesis. This shows workers safe behaviour have a strong positive impact job performance of workers.

VII. CONCLUSION

The high rate of fatalities and long-term injuries in the construction sector makes the sector ineffective and is unacceptable in modern society. On construction sites for buildings where the work is labour-intensive and the labour force is inexperienced, it was more likely that the temporary labour force would be exposed to occupational accidents, illnesses, and injuries if it had not received the proper training in safety and health and PPE. According to this study, workers' attitudes towards safety and their training in safety have a significant positive impact on their ability to perform their jobs. Before beginning construction work, organisations should also train their staff and provide pertinent information to help them identify risks. Organizations should also assign worker supervisors for each team or group of workers engaged in various tasks throughout the same projects who have the necessary skills and experience to encourage them to complete their work safely. The majority of the city's construction sites lacked personal protective equipment, welfare services, and worker safety training. Therefore, the need for safe workplaces goes beyond what is required by law and morality.

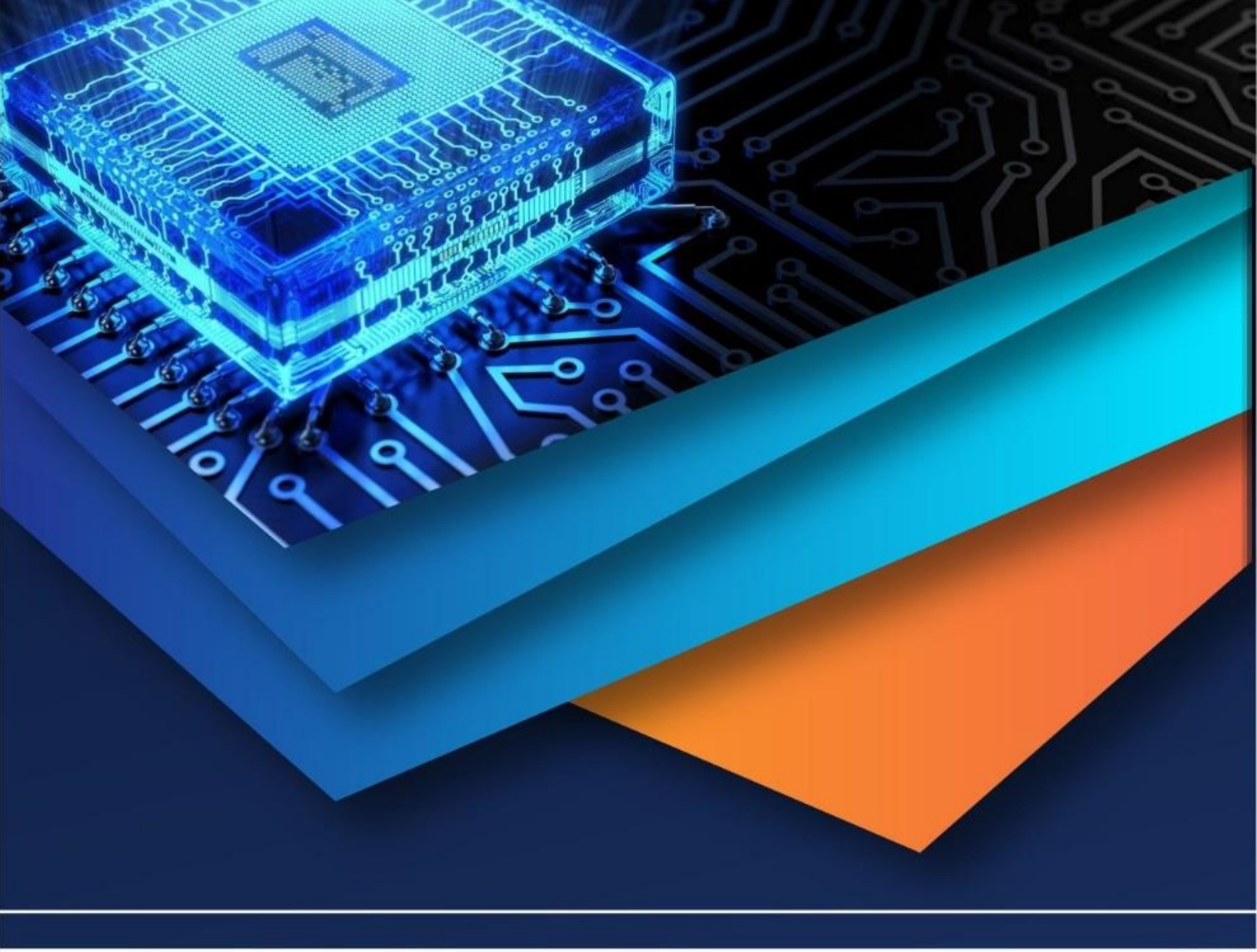
VIII. RECOMMENDATIONS

This study had examined workers' attitudes towards safety and their training in safety have a significant positive impact on their ability to perform their jobs. The results of the study suggest that further research is needed in the following areas. Poor safety and health management has an influence on both workplace safety and occupational health. Yet, identifying and assessing workplace health concerns takes time. More research must be conducted in order to create some occupational health standards. Future research must look into and clarify the socioeconomic effects of occupational accidents, diseases, and injuries

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