



INVESTIGATION ON THE SAFETY MEASURE IN CONSTRUCTION INDUSTRY AT CONSTRUCTION SITE

Bhavani A, B.Manibalu, R.K.Manikandan,

Assistant Professor, Department of Civil Engineering, Dhanalakshmi Srinivasan Engineering College, Perambalur,
Tamil Nadu, India

Abstract -Construction Industry is most thriving industries across the globe. Construction Sector is the second largest industry of the country followed by Agriculture. It is all about constructing buildings, bridges, roads and the civilization of the society. The Construction Industry has around 8% contribution to India's Gross Domestic Product. The development and the infrastructure of a Nation entirely depends on the development of the construction and its process. On the other hand, the execution of work in constructional industries is also full of risk and hazard. Thus, maintaining safety in such industries also play a vital role for healthy working atmosphere. The prime objective of this research is to analyze the needs of safety and other important factors that influence the safety and evaluate the safety practices regularly. To obtain the research goal, a detailed literature review along with a descriptive field study has been conducted. In this descriptive design of research, a total population of 110 was taken for example study in the region of OMR, Chennai Tamil Nadu, India. The required information was directly collected from the respondents and also through email, according to the need and availability of the respondents. The field survey involved a detailed designed questionnaire which was administrated using percentage analysis method and for arriving in conclusion, statistical tool Karl Pearson's co- efficient method and weighted average method was used.

Key Words: Safety measures, accidents, occupational health and safety act, construction, occupational hazards

1. INTRODUCTION

Construction Industry is an important sector that contributes a high rate in economic growth. The history of organized on systematic way for construction practice in India has been started to around 1847 AD when Lord Dalhousie entrenched the Public Works Department, nowadays it has been called as PWD for the construction to civil engineering structure for constructing road, small dams, canals etc. Later on, many construction industries have been started for the growth of our country. Some of the construction industries are Hindustan Construction Co. Ltd, Jaiprakash Associates Ltd, Sadbhav Engineering Ltd, and Simplex Infrastructures Ltd and so on, among all the construction industries Larsen & Turbo (L&T) was the first and largest construction industries in India. In construction site the safety plays a vital role because in all type of workplace safety is more important for the workers while comparing to other type of industries in construction site, they need more safety and they should have more caution doing their work in constructing of building, roads and bridges. The workers should awareness of safety and follow safety measures regularly at workplace to avoid accidents; some of the safety equipment's are Safety goggles, shoes, safety helmet, safety gloves, first-Aid kit and water.

Selvam et.al explains about, the various safety and control measures (SCM) of accidents in building projects to minimize accidents' occurrence and consequent waste generation. A research methodology, consisting of a literature review and a field study were used to achieve the research objectives. The field survey involves a designed questionnaire that was administered through convenience sampling technique within Lagos State and descriptive analysis tools were used for the analysis. The field survey reveals different control measures in place and their rate of usage on building projects. On the other hand, the literature survey sheds light on the types of accidents on building projects and their respective control measures with methodologies for accidents' preventions. Recommendations based on the findings of the two surveys are outlined in the paper.[1]

Dheeraj Benny et all explains about, Construction activities have made a great breakthrough in the last two decades on the back of increase in development activities, and public demand. Still occupational health and safety issues have become major concern to construction organizations. The world society and economy have suffered financial and human losses as a result of poor safety management in the construction industry. The impact is however more in developing countries. The purpose of this study is to explore major safety provisions and also a detailed study has been conducted on safety management procedures in construction sites. Different types of accidents occurring in construction sites and measures taken to control these

accidents are also analyzed in this paper. Data have been collected through various site visits, literature review and from various construction safety standards including BIS and OSHA (Occupational Safety and Health Administration). The paper has been concluded after putting forward a set of recommendations for construction organizations to improve the occupational safety in the construction sites.[2]

Adeeba A. Raheem et.al explains about, Despite the Pakistani construction industry's recent rapid growth and development, workers are still working in poor safety conditions. While Pakistan has several occupational safety and health laws, they are too broad to be applied directly to the construction industry. Due to the presence of a weak regulatory system, worker safety is not a principal focus of the construction industry. This paper presents a case study that was conducted to help improve the existing construction safety situation in Pakistan by developing a framework for better implementation of safety practices and thus bridging the safety related perceptual gaps between the different stakeholders and regulatory authorities. The proposed safety framework is composed of guidelines for a reciprocal safety implementation system with aspects such as regulatory enhancements and corporate safety culture improvements. The framework was analyzed using the Delphi method and priorities were defined as rated/ranked by a panel of Pakistani construction Safety experts. The emphasis of this framework is to expend all possible efforts to minimize the safety risks for construction workers through stronger regulations and voluntary compliance efforts by all the stakeholders. This case study can serve as a model for other developing countries to further develop and improve their construction safety environment.[3]

Dr. G.Yoganandan et.al explains about, the cement industry plays an important role in the construction and engineering industry. This study aimed at finding out the views and awareness workers on health and safety measures in Chettinad Cement Corporation Limited, Karur. The various welfare measures provided by the employer will have immediate impact on the health, physical and mental efficiency of the employees. The sample size was 319. The tools used in this research are percentage analysis, chi-square, t-test and factor analysis. This study found that majority of the employees belong to the age group of 31-40 year and there is a significance relationship between experience and their perception on health and safety measures in Chettinad Cement Corporation Limited and there is a significance relationship between designation and the workers perception on overall facilities. The study suggested that the organization need to increase salary to the employees, take appropriate measure to reduce the air pollution caused by the manufacturing operation and also through other measures like planting trees and using air filters.[4]

T. Subramani et.al explains about, The Indian society and economy have suffered human and financial losses as a result of the poor safety record in the construction industry. The purpose of this study is to examine safety management in the construction industry. The study will collect data from general contractors, who are involved in major types of construction. Collected data include information regarding organizational safety policy, safety training, safety meetings, safety equipment, safety inspections, safety incentives and penalties, workers' attitude towards safety, labor turnover rates and compliance with safety legislation. The study will also reveal several factors of poor safety management. Thus, the paper will conclude by providing a set of recommendations and strategies to contractors for improving their safety performance.[5]

P.Vinotha et.al explains about, the researcher carried out this study with the primary objective of "A study on industrial health and safety measures" in H & R Johnson India Ltd, Thennangudi. The need and importance of the study highlighted the health and safety measures which imply to improve the performance of the employees. The research was conducted with the sample of 150, on the basis of dis- proportionate stratified random sampling. The primary data was collected by means of a structured questionnaire which is filled by the respondents. The collected data were analyzed for interpretation by simple percentage analysis and Weighted Average Method. The study also focuses what are the safety equipment is necessary and how it protect the employees from the accident at the work spot. This study is very useful for the organization & future to make use of it for their development.[6]

Ruby Melody et.al explains about, "Impact of Health and Safety Management on Employee Safety at the Ghana Ports and Harbor Authority" found that majority of the employees knows very well about the organization's health and safety policy. Nearly one third of employees have experienced accidents or health problems that are related to works. The author pointed out to the company that health and safety management systems occurs due to, ignorance of safety regulations, lack of safety rules, unavailability of essential safety equipment, poor training in safety.[7]

2. RESEARCH METHODOLOGY

The Research purpose for my study is primarily descriptive in nature. It also includes surveys and facts finding enquire of various kinds of data are major purpose of descriptive research is descriptive of state of affairs, as it exists up to present. Samples of questionnaire are used for this research. The research methodology is utilized in descriptive research are survey methods in all ways such as comparative and correlation methods. The population of the study is 110. Data collection is gathering data or information for the purpose or need. Primary data collection has done through personal interaction with the construction site workers by questionnaire. Secondary data collected from websites, Journals, Internet pertaining to the topic. Finally, the SPSS tool used in this research are Karl's Pearson's correlations method and weighted average methods for arriving conclusion.

3. OUTCOMES AND DELIBERATIONS:

Table -3.1: Outcomes

SL. NO.	FACTORS OF RELATIONSHIP	CATEGORY	FREQUENCY	VALID PERCENTAGE
1	AGE GROUP	21- 25 Years	35	31.81
		25-30 Years	40	36.36
		30-40 Years	20	18.18
		40-50 Years	10	9.09
		Above 50 Years	5	4.54
2	Gender	Male	90	81.81
		Female	20	18.18
3	Safety procedure are developed	Always	21	19.09
		Usually	21	19.09
		Sometimes	47	42.72
		Rarely	11	10
		Never	10	9.09
4	Satisfaction towards safety procedure	Strongly agree	35	31.81
		Agree	20	18.18
		Neither agree nor disagree	18	16.36
		Disagree	32	29.09
		Strongly disagree	5	4.54
5	Keeping up-to-date of OHS act & regulation	Strongly agree	30	27.27
		Agree	41	37.27
		Neither agree nor disagree	23	20.90
		Disagree	11	10
		Strongly disagree	5	4.54
6	Awareness towards hazards at workplace	Fully	32	29.09
		Partially	14	12.72
		Never	30	27.27
		Sometimes	18	16.36

		Often	16	14.54
7	Awareness to First aid kit and ailments	Excellent	30	27.27
		Good	32	29.09
		Average	24	21.81
		Below average	17	15.45
		Poor	7	6.36
8	Safety measures on excess weights	Strongly agree	22	20
		Agree	47	42.72
		Neither agree nor disagree	30	27.27
		Disagree	8	7.27
		Strongly disagree	3	2.72
9	Fire extinguish service condition	Strongly agree	32	29.09
		Agree	46	41.81
		Either agree or disagree	22	20
		Disagree	8	7.27
		Strongly disagree	2	1.81
10	Safety measures on Hoists and Lifts	Strongly agree	28	25.45
		Agree	24	21.81
		Either agree or disagree	30	27.27
		Disagree	24	21.81
		Strongly disagree	4	3.63
11	Safety procedure are regularly evaluated	Always	32	29.09
		Usually	30	27.27
		Sometimes	24	21.81
		Rarely	17	15.45

		Never	7	6.36
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The above table it is inferred that has positive correlation between fire extinguish and Up-to-date with occupational health and safety act.

Weighted Average methods:

WEIGHTED AVERAGE METHOD= $\sum W_i X_i / N$

$$= 5 \times 21 + 4 \times 21 + 3 \times 10 + 2 \times 11 + 1 \times 47 = 288/15 = 19$$

$$= 5 \times 35 + 4 \times 20 + 3 \times 18 + 2 \times 32 + 1 \times 5 = 378/15 = 25.2$$

$$= 5 \times 32 + 4 \times 14 + 3 \times 30 + 2 \times 18 + 1 \times 16 = 358/15 = 23.86$$

$$= 5 \times 32 + 4 \times 30 + 3 \times 24 + 2 \times 17 + 1 \times 7 = 393/15 = 26.2$$

$$= 5 \times 28 + 4 \times 14 + 3 \times 30 + 2 \times 18 + 1 \times 16 = 338/15 = 22.53$$

Table: 3.2 Weighted Average methods:

S.NO	FACTORS	TOTAL	RANK
1.	Safety procedures are developed	19	V
2.	Safety procedures are satisfactory	25.2	II
3.	Hazards at Workplace	23.86	III
4.	Safety procedure are regularly evaluated	26.2	I
5.	Safety measures on hoists and lifts	22.53	IV

- Majority of the respondents belongs to age group 25-30years
- Majority of the respondents are said that safety procedure is developed sometimes
- Majority of the respondents are satisfied for safety measures and procedure.
- Most of the respondents are said keeping up-to-date of OHS act & regulation in their workplace.
- Majority of respondents are said the safety procedure regularly evaluated in their workplace.
- Majority of respondents are aware about the hazards at workplace.

Table-3.3: Karl Pearson's Correlation Method:

Correlations

Correlations

		Fire Extinguish in serviceable condition	Up-to-date with the OHS act
Fire Extinguish in serviceable condition	Pearson Correlation	1.000	.945**
	Sig. (2-tailed)	.	.000
	N	110	110
Up-to-date with the OHS act	Pearson Correlation	.945**	1.000
	Sig. (2-tailed)	.000	.
	N	110	110

** . Correlation is significant at the 0.01 level (2-tailed).

The above table is inferred as it is found that the safety procedures are regularly evaluated has been ranked 1st followed by the Safety procedure are satisfactory, Hazards at workplace, Safety measures on hoists and lifts, Safety procedures are developed.

4. CONCLUSIONS

The workplace in construction sector or industry is riskier because of carrying huge equipment's and materials from one place to another without proper safety measures; it may lead to some accidents at workplace. The study also suggests that the insurance scheme to be provided for the workers covering accidents at workplace and safety programs will also help the workers to be precaution of accidents on the workplace. It as concludes that to avoid accidents, hazards, injuries at workplace the workers should use the proper safety measures before getting into their work. According to survey and research method it is inferred that few prevention measures for accidents: Some of the prevention measures to avoid accidents Use of Safety Devices, Safety training, safety habits, educational measures, Safety Campaigns and Posters and safety committee.

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