

---

# Study On Job Hazard Analysis In Material Handling At Various Construction Projects

## Introduction

I did a project titled “Study on job hazard analysis in materials handling at various construction projects” in partial fulfillment for the award of the degree of Bachelor of Engineering in Civil Engineering at KSR college of Engineering under Anna University, Chennai, Tamil Nadu, India during the period 2011-2015. I completed this project under the supervision of one of my professor.

## Background

### Nature of the Project

Different accidents may occur in light as well as heavy construction works. Such accidents occur during various stages of construction such as work design phase, tool design phase, fabrication process etc. Labours who must often lift, stoop, kneel, twist, grip, stretch, reach overhead, or work in other awkward positions to do a job are mostly at risk of developing a work-related musculoskeletal disorder (WMSD). Some of the WMSD are include back problems, carpal tunnel syndrome, tendinitis, rotator cuff tears, sprains, and strains etc. So it is very important to carry out manual tasks risk factors analysis as well as carry risk management.

This project is about the study of job hazard analysis in material handling at various construction projects. It dealt with various identification of various manual risk factors caused by work design, load handling design, work organization etc. It also suggests suitable safety measures to be followed by construction workers, builder, project manager etc. This project follows Participative Approach for Material Handling and Manual Tasks.

### Objective of the project

To study various manual tasks risk factors caused by work design, tool design, load handling design, work organization etc.

To know various work related musculoskeletal disorders.

To be capable of performing material handling risk assessment and risk management.

---

## Need help with the assignment?

Our professionals are ready to assist with any writing!

[GET HELP](#)

---

## Nature of your particular work are

I participated in all most every tasks of the project such as questionnaire survey, data analysis, identification of major manual task risk factors etc. I visited to different construction sites to conduct questionnaire survey and gathered all the required information. I also performed the data analysis using SPSS software.

## Duties and responsibilities

I conducted the literature reviews on job hazard analysis and safety analysis by reading previously done projects, journals, books, etc.

Then I prepared the suitable methodology to study job hazard analysis in material handling at various construction projects.

I also prepared the sets of question for questionnaire survey.

After that I did site visits to different construction sites and gathered related details through questionnaire survey and personal interviews of the workers.

And I did analysis of questionnaire by using SPSS software.

I used some statistical tools for the study of collected information.

Then I identified the various manual tasks risk factors and finally I suggested the suitable safety measures for each identified risk factors.

## Personal Engineering Activity

Initially I conducted literature reviews on job hazard analysis and safety analysis by reading previously done projects, journals, books, etc. I studied various manual tasks risk factors caused by work design, tool design, load handling design, work organization etc. I learnt about material handling risk assessment and risk management. I also studied different work-related musculoskeletal disorders (WMSD) faced by construction workers.

After the literature review I deduced proper method methodology to be followed to complete my project. I used Break down structure technique to split our project into various manageable units like- Preparation of sets of questions for questionnaire survey, Sites visit, conducting questionnaire survey, Data analysis, Identification of manual risk factors ,Suggesting safety measure etc. the methodology that I deduced for my project was:

---

## Need help with the assignment?

Our professionals are ready to assist with any writing!

[GET HELP](#)

---

After preparing suitable methodology for the project, it was strictly followed. I prepared sets of questions to be asked construction workers and other representatives for conducting questionnaire survey. Some of the questions that I made were related to Heavy lifting like - Do any workers have to lift more than 23 kilograms at one time without help? Do workers have to lift more than 10 kilograms often? Are there handles to help carry materials? Do workers have to bend down to lift materials? Etc. Similarly some questions were related to tools like- Are tools sharp and in good condition? Are genuine spares used? Etc. And some were related to Awkward Postures like- Are knee pads or cushions available and are they used? Can rotation or rest breaks be used to reduce time in awkward postures? Etc.

After preparing the relevant sets of questions to be asked, I visited different constructions sites where light as well as heavy construction works were going on .I asked the prepared question to every workers and some of the project representatives and collected the information. I also gathered other details through personal interview and direct observations of ongoing process of work.

After the site visit and questionnaire survey I performed data analysis using SPSS software. I used version 10.0 package, which has two main sections- for defining and entering data and for output. When defining and entering data, users can move between the 'variable' and 'data' 'views' by clicking on the tabs at the bottom of the screen. The third 'output' section opens in a separate window and displays the results of the statistical analyses. The 'output' data are saved as a separate file to the data set.

I used mainly two statistical techniques for the study which were simple average method and weighted average method.

### **Simple average method**

I enquired workers about production pressures and represented the simple average analysis as follows:

S.NO PARTICULARS RESPONDENTS PERCENTAGE

1. Strongly Agree 2 10
2. Agree 5 25
3. No Comments 3 15
4. Disagree 6 30
5. Strongly Disagree 4 20

Total 20 10

---

## **Need help with the assignment?**

Our professionals are ready to assist with any writing!

**GET HELP**

---

Similarly I did enquiry about musculoskeletal symptoms and represented the simple average in tabular as well as in graph which are shown below:

#### S.NO PARTICULARS RESPONDENTS PERCENTAGE

1. Strongly Agree 0 0
2. Agree 13 65
3. No Comments 6 30
4. Disagree 1 5
5. Strongly Disagree 0 0

Total 20 100

#### Weighted average method

I used  $XW = \frac{WX}{X}$  formula to calculate the weighted average of collected data.

I did enquiry about heavy lifting and represented the weighted average analysis as follows:

#### S.NO QUESTIONS STRONGLY AGREE AGREE NO COMMENTS DISAGREE STRONGLY DISAGREE TOTAL AVERAGE RANK

1. Do any workers have to lift more than 23 kilograms at one time without help? 7 11 0 2 0 37 2.47 3
2. Do workers have to lift more than 10 kilograms often? 11 9 0 0 0 29 1.93 5
3. Are there handles to help carry materials? 13 6 0 1 0 29 1.93 5
4. Are workers told to get someone's help to lift heavy materials? 6 9 4 1 0 40 2.67 2
5. Are there carts, dollies, or other aids readily available for moving materials? 9 7 4 0 0 35 2.33 4
6. Do workers have to bend down to lift materials? 2 7 5 5 1 51 3.40 1

It is inferred from the above table that the respondents risk level on various factors of Heavy lifting. Hazard factor due to bend down to lift materials got 3.40 average weight, followed by help to lift heavy materials 2.67 , to lift more than 23 kilograms at one time without help 2.47 , aids readily available for moving materials 2.33 and so. It is inferred from the above table having more weight among other factors.

Similarly Weighted Average analysis for Awkward Postures is as follows:

1. Are knee pads or cushions available and are they used? 1 6 10 3 0 55 3.7 1

---

### Need help with the assignment?

Our professionals are ready to assist with any writing!

[GET HELP](#)

- 
2. Can scaffolds, platforms, or other equipment cut down on the need to work overhead? 6  
4 3 5 2 53 3.53 2
  3. Can rotation or rest breaks be used to reduce time in awkward postures? 4 16 0 0 0 36  
2.4 3

It is inferred from the above table that the respondents risk level on various factors of awkward postures. Hazard factor due to knee pads or cushions available and are they used have got 3.7 average weight, followed by the scaffolds,

After statistical study of the response from respondents, I identified some of the manual tasks risk factors caused by work area design. For ground and floor level work, labors may have to stoop or kneel when installing or finishing slabs, decks, or floor coverings. Bending, Stooping, kneeling, or squatting can cause pain in your lower back or knees Positions. I suggested that Floor-level work cannot be eliminated from construction, but it is possible to change it is possible to change how they do it so it is easier on your body. Solutions are available that can reduce the level of stress on back, knee, and other parts of the body. They may also reduce how often and how long the body is subjected to this stress. Many of the solutions can also eliminate other potential safety hazards and increase productivity.

Some of other identified risk factors were caused by tools design such as workers develop muscle or joint injuries while using finishing tools, rebar tying tools etc. and also caused by load handling design such as For masons and mason tenders, lifting and placing CMUs can cause fatigue and put strain on the low back, hands, and arms. If they do this work often, they may be at risk of a serious muscle or joint injury.

I suggested some general solutions for doing material handling with less risk of injury which include-Change materials or work processes, Change tools and/or equipment, Change work rules, Provide training and related programs

### **Technical Problem and Solutions**

I mainly encountered two problems while doing this project which were:

The first problem that I faced was during the site visit to construction sites. The representative from contractor was not allowing us to interact with the workers. The reason behind this was we reached the site at initial working hours and I also came to know that the project was going behind scheduled time. This problem could have failed our project as our whole project of manual risk factors assessment was based on questionnaire survey. I telephoned my supervisor and he suggested me to convince the contractor for allowing interaction with workers. I said him that such job hazard analysis and safety analysis projects were not just for workers rather

---

### **Need help with the assignment?**

Our professionals are ready to assist with any writing!

**GET HELP**

---

equally useful and beneficial to supervisors, builders, project manager, etc. I made him realize that workers safety is contractor's responsibility. Finally he understood and allowed us for the survey. so only after that questionnaire survey we were able to implement remaining methodology of the project.

The second problem I had to go through was during the use of statistical tool for the study. I found that one the complete set of data was missing and it was because of wrong statistical sampling. This could have affected our whole analysis part. I called a group discussion and also talked to my supervisor. He suggested me either go for site visit once again and collect the data or else do interpolation and find the missing data. I applied interpolation and found the missing data which saved my time and effort of visiting that site once again and in returned it didn't extend our total project duration too. In this way I solved these issues by utilizing the technical knowledge and skills.

### **Creative works**

I used interpolation to find one of the missing data of survey instead going site once again and collecting data. This saved my time and effort of visiting that site again and in returned it didn't extend our total project duration too.

### **Team Coordination**

As I was the leader of the project, I assigned and managed each tasks to all group members. We frequently had group discussion regarding the problems that aroused during the project. We all supported, suggested and cooperated each other so well that we were able to accomplish our tasks in time and finally completed our project within the dead line.

### **Codes and Standards**

I applied codes of practice for occupational safety and health. I followed standard Participative Approach for Material Handling and Manual Tasks to complete my project.

### **Summary**

This project was about analysis of various job hazards occurring during material handling in various construction projects. it dealt with study of various musculoskeletal disorders faced by workers. The main goals of our project was to perform manual tasks risk factors assessment and risk management which were fulfilled at the end of the project did site visits to different construction sites and conducted questionnaire survey and performed on site assessment. I also identified various manual tasks risk factors caused by work area, tool design, load handling

---

## **Need help with the assignment?**

Our professionals are ready to assist with any writing!

**GET HELP**

---

design etc. and suggested suitable safety measures too.

This project was based on Participative Approach so I had to interact with different workers during questionnaire survey which improved my communication skills. I used different statistical tools for my study so my mathematical knowledge also got increased. I used Microsoft excel for keeping the record of survey which improved my excel skills too. During the project my leadership, teamwork, technical knowledge and managerial skill were also increased. Our project supervisor was very happy and proud with our projects because we were only the one to o such projects in my whole college and we completed it successfully within the time.

gradesfixer.com

---

### **Need help with the assignment?**

Our professionals are ready to assist with any writing!

**GET HELP**