



# STUDY ON ERGONOMICS AMONG CONSTRUCTION LABOURS

M.Gnanaprakash<sup>1</sup> Mrs.D.Ambika<sup>2</sup>

1. II Year M.E., (CEM), Department of Civil Engineering, Kongu Engineering College, Erode

2. Assistant professor, Department of Civil Engineering, Kongu Engineering College, Erode

## ABSTRACT

*Ergonomics is used to design an environment which is compatible with each individual physical and behavioral characteristics. Good ergonomic design makes the most efficient use of worker capabilities while ensuring that job demands do not exceed those capabilities.*

*In various workstations the productivity and efficiency gets affected due to discomforts and several other human factors. A clear study of these parameters and optimizing them to yield better productivity is called ergonomics. By using this technique we have planned the preliminary questionnaires which were supplied to construction labourers, who have under taken the works in Tiruppur and around. The district preliminary questionnaires were distributed and data responses were collected in a month. Based on the responses obtained from labourers the data's are analyzed using SPSS software. Which is an analytical software. From the analysis, a better suggestion and solution were given to the construction labourers. Also recommendations are given for safety and comfort environment of construction labourers using this ergonomic techniques.*

## 1 INTRODUCTION

### ERGONOMICS

Ergonomics is the science that plans and designs tasks to fit workers. Ergonomics deals with human characteristics, expectations and behaviors in the design of the tasks where people doing their work day to day. Basic ergonomics risk factors include force, repetition, awkward and static postures, physical and mental stresses.

### 2 UNDERSTANDING ERGONOMICS

Ergonomics is used to design an environment (layout, work methods, equipment, noise, etc) which is compatible with each individual physical and behavioral characteristics. Ergonomics looks at the behavior of the person performing the job. Good ergonomic design



makes the most efficient use of worker capabilities while ensuring that job demands do not exceed those capabilities.

## 2.1 DEFINITION OF ERGONOMICS

The science on how to fit the task and working environment to the worker using scientific data. A derivative of the Greek terms; ergon and nomos

$$\text{ERGON} + \text{NOMOS} = \text{ERGONOMICS}$$

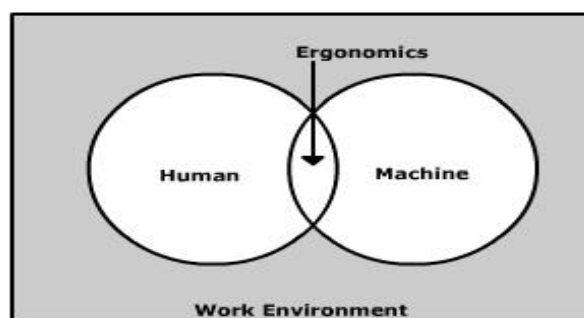
(Work and effort) (Law or surroundings)

Adoption of job and workplace to the worker by designing tasks within the workers capabilities and limitations.

## 2.2 OBJECTIVES OF ERGONOMICS

To obtain an effective match between the worker and work system to optimization.

- To study about the ergonomic aspects among construction labourers
- To suggest suitable safety and comfort working environment for the construction labourers



**Fig.1.5 Human-machine interaction**

## 2.3 ERGONOMIC ASPECTS

Basically Ergonomics deals with following aspects

- Science & Arts of Man: Fundamentals & aesthetics studying human behavior, abilities, limitations and other context specific characteristics.



- Technology for human use: Practical applications aspects with discovery of appropriate applications of the same information (after proper analysis of context) to the design of tools, machines, applications. Systems, tasks, jobs and environment
- Physiological and performance effect:This Methodology is to evaluate the benefits occupational settings.
- Ventilation and pollutants: This discipline has a Military origin way back to World War II and has Art & Design movement

### **3 PROBLEM ENCOUNTERED**

- Handling
- Lifting
- Pulling
- Bending

#### **3.1 PERSONS INVOLVED AT THE SITE**

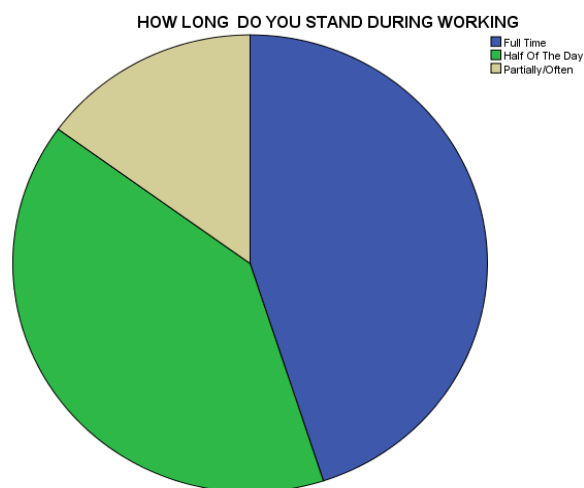
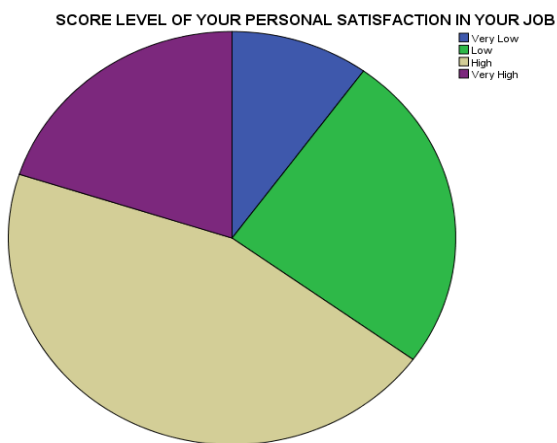
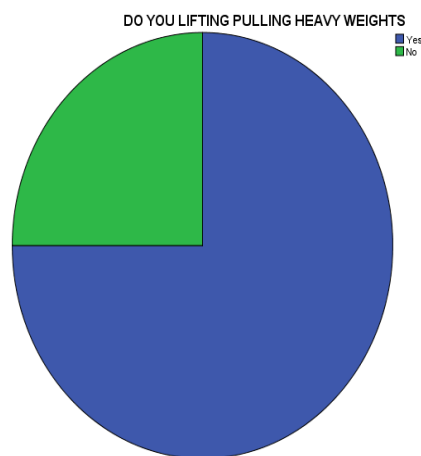
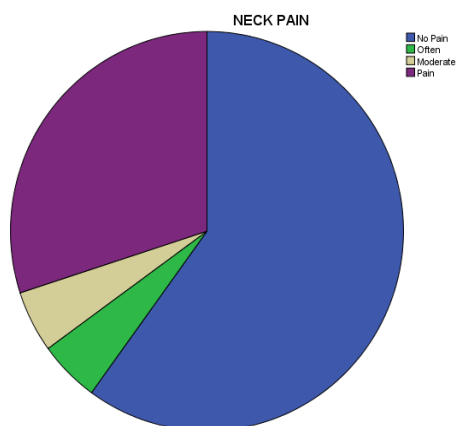
- Masons
- Laymen
- Mazdoors
- Bar benders
- Carpenters
- Electricians
- Plumbers
- Pit excavators
- Tile layers
- Painters

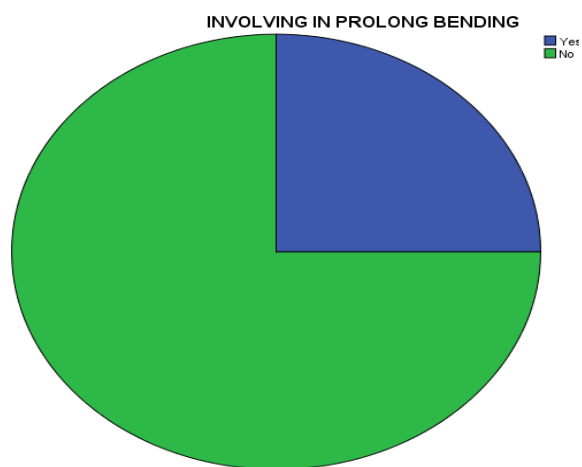
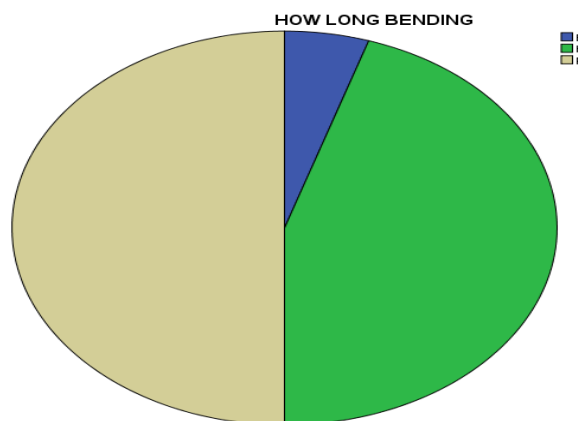
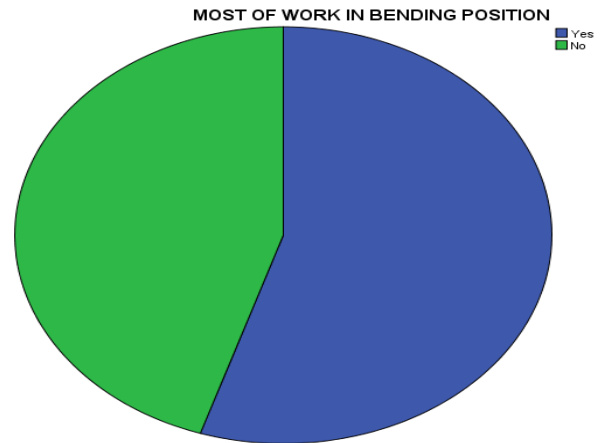
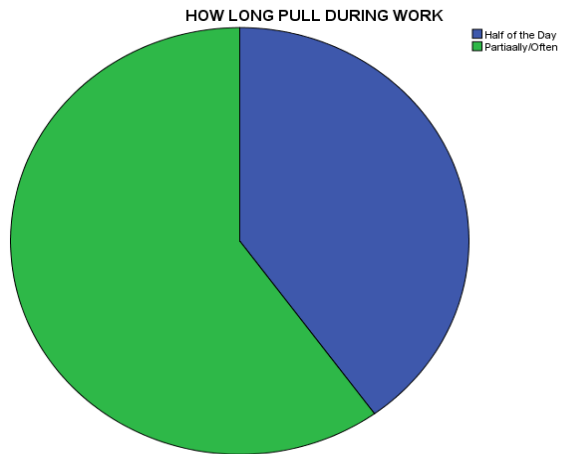
#### **4 ANALYSIS OF ACTIVITIES USINGSPSS (Statistical Package For Social Sciences)**

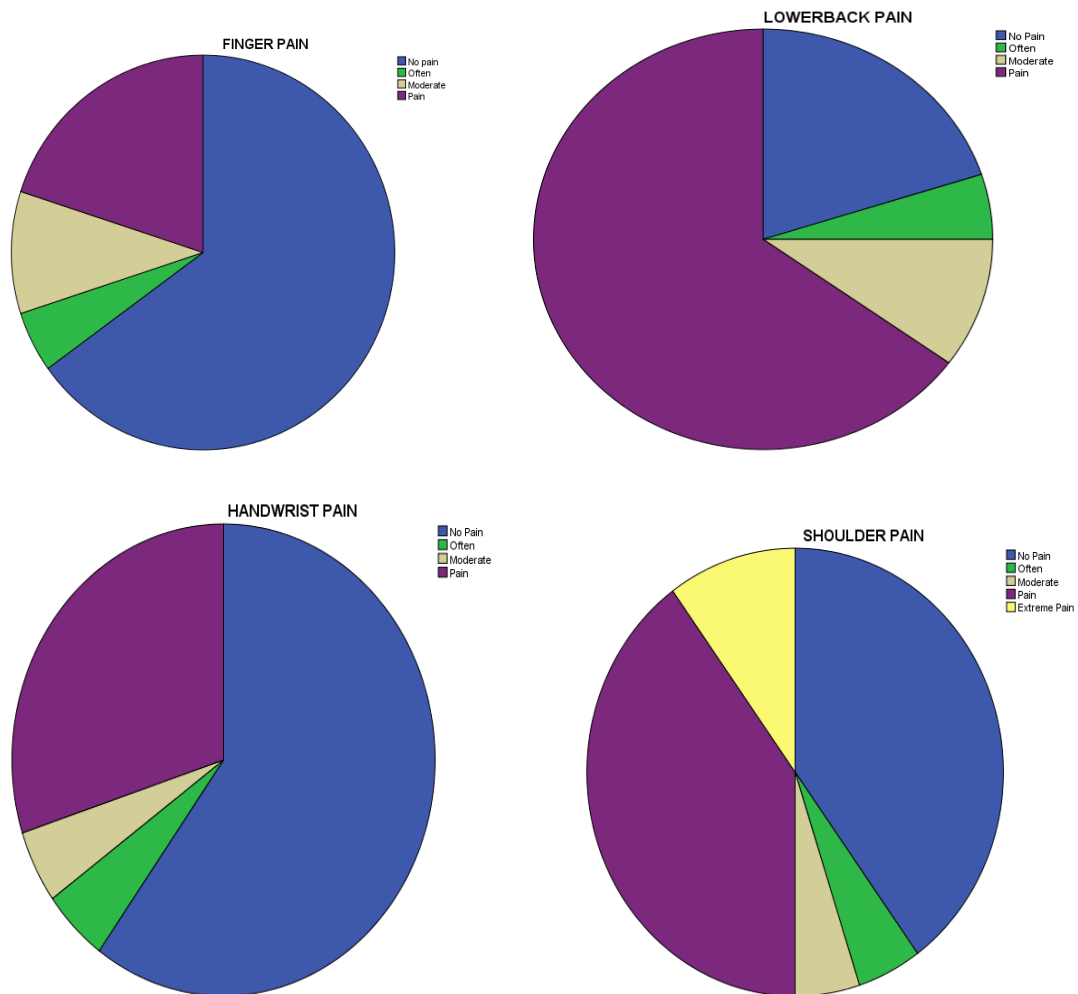


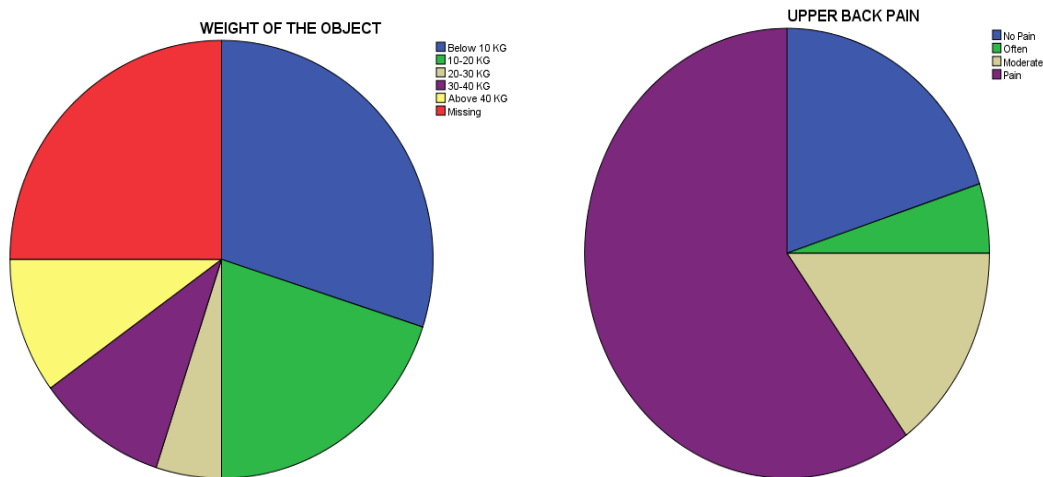
Making use of all activity with respect to each and every individuals, graphical representation and results of ergonomics factor is done based on the questionnaire survey

### 5 DATA ANALYZE RESULTS









## 6 RESULTS

From the response attained from various labours in many construction sites, the following are some of the inferences made from the obtained results are,

- 80% of people are possessing lower back pain during the time of work. Whereas, the remaining 20% of people doesn't feel any sort of pain.
- 80% of people are possessing upper back pain during the time of work. Whereas, the remaining 20% of people doesn't feel any sort of pain.
- 40% of people are possessing neck pain during the time of work. Whereas, the remaining 60% of people doesn't feel any sort of pain.
- 35% of people are possessing finger pain during the time of work. Whereas, the remaining 65% of people doesn't feel any sort of pain.
- 60% of people are possessing shoulder pain during the time of work. Whereas, the remaining 40% of people doesn't feel any sort of pain.

## 7 REFERENCES

- Shackel, B., ed. (1974) Applied Ergonomics Handbook. Surrey, England: IPC Business Press.
- Kaplan, A. June 1980. "Sitting Ergonomically." Modern Office Procedures.



- Sue Hignett<sup>1</sup>, John R. Wilson<sup>2</sup> and Wendy Morris<sup>2</sup> Finding ergonomic solutions— participatory approaches(2000)
- Ergonomics: The Study of Work Occupational Safety and Health Administration(2000)
- Silverstein, B. & Clark, R. (2004). Interventions to reduce work-related musculoskeletal disorders Journal of Electromyography and Kinesiology, 14, 135-152.
- Identification of ergonomics interventions used to reduce musculoskeletal loading for building installation tasks (2004)
- Preliminary Requirements for an Ergonomics Problem Reporting Vicente de Faria Cunha, Patrick K. Giesecke, Amy J. Peckinpaugh, Ellen Bass Senior Member,(2004)
- Burgess-Limerick, R., Joy, J.Straker, L., Pollock, C. & Cliff, D. (2006). Implementation of an Ergonomics Program Intervention to Prevent Musculoskeletal Injuries Caused by Manual Tasks. Coal Services Health & Safety
- Simple solutions ergonomics for construction workers Public Health Service Centers for Disease Control and Prevention national institute for occupational safety and health (2007)