CHAPTER 2

AIMS AND OBJECTIVES

2.1 Rationale for the Study

The process of Manual Material Handling (MMH) involves three distinct phases: lifting, carrying and lowering loads. While each of those highly complex by itself, majority of literature available are on the process goes against the gravitational force, thus demanding highly integrated musculoskeletal involvement, and therefore maximum chances of musculoskeletal injuries.

Load carrying is important phase of manual material handling as it involves sustained muscular contraction for holding the load in position while body moves, and therefore the process is also prone to musculoskeletal injuries as discussed in Chapter 1. Present study has been conducted from the view point of manual load carrying by Indian industrial/operational workers involved in organized and unorganized sectors.

2.2 Aim of the Study

Present study is aimed to perform the Musculoskeletal and Biorhythmic studies on Indian industrial/operational workers involved in carrying load. The more specific aim of the study is to determine the safe load to be carrying by the industrial workers of organized sectors (Foundry industry & Sugar industry) and operational workers of unorganized sectors (Women Carrying Water and Scaffolders) for avoiding the work-related musculoskeletal disorders (WRMSDs).

2.3 Objectives

A. Determination of optimal safe load to be carried by Indian industrial/operational workers involved in organized and unorganized sectors by identifying the loads in various risk categories considering the effect of following parameters on occupational injury:-
Field environment parameters, work-rest allowance, walking speed of subjects and Heart rate recovery cost of subjects under study.

Study of Biomechanical characteristics of the workers while carrying loads.

Determination of Physiological cost during carrying load under different modes.

Heart rate variability.

Heart rate recovery cost.

Physiological effect and corresponding psycho-physiological perception on heaviness of load while carrying load in different modes.

Gender differences in psychophysically determined maximum acceptable weights and forces for industrial workers.

Correlation of physiological cost with bio-mechanical and Psychological cost of load carrying.

B. Association of work stressors among male and female workers with the prevalence of WRMSDs along with shift work and extending working hours.

C. Development of a Back Propagation Neural network model which can classify the carrying load into different risk (High/Low) potentials for physiological stress of male and female industrial/operational workers to give a line of demarcation for MSDs.

D. Execution of “Biorhythm theory” on Indian operational workers for showing the effect of critical days on the occurrence of accidents and identifying the accident prone dates of the industrial/operational workers involved in the concerned sector so that in those dates the workers may not be given hazardous task.