Physical Workload Assessment Using Chamoux Method Simulated at Workplace Environment Laboratory

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Author Note: So proud of be part of the University’s Manufacturing Lab (SWE)

Abstract: The metabolic load or energy expense is a measure of physical effort performed during any work execution, so it is one of the main components that make up the working conditions, whose intensity is influenced by the physical work level required in some environmental conditions. The muscles require blood, and therefore the heart must provide greater flow, which means increase the heart rate according with the work demands. The purpose of this study is evaluating physical load during the tasks development at the Simulation Work Environmental Laboratory of the UANL University. In the present research, we used Chamoux methodology that is based on heart rate in order to assess cardiovascular effort of the participants at the Simulator Practices of the career Industrial Engineer with minor in Management. This study allowed us to know if there was a physiological maladjustment or contrary if the job does not require enough effort. At the end the participants implemented some corrective actions order to balance the workload and prevent risks such as physical fatigue and stress.

Keywords: Physical workload, Heart Rate, Chamoux Method, Fatigue

1. Introduction

In many productive processes, jobs sometimes are assigned according to incomprehensible criteria. It seems to be complicated to put in the right place the right person in order to be productive. We know that is important to improve the working conditions of any employee in order to be comfortable and consequently productive.

One of the concerns is to ensure that the physical workload be the less tough possible (Tynes, 2017). The aim of the present study is to classify physical work requirements into categories based on the amount of energy expenditure (EE) during the Simulation Work Environmental Laboratory (SWE) of the UANL University.

The physical workload associated any job can be measured through energy expenditure, and is possible to estimate the energy expenditure by heart rate monitoring since there is a linear relationship between heart rate and energy expenditure.

We desired to use the Chamoux and FRIMAT criteria, because it is based on heart rate monitoring during the jobs performance. The heart rate (HR) monitoring is one of the most popular indirect methods to estimate energy expenditure (EE) as it is a practical and low-cost method (Garet, 2004).

As a result, workload monitoring in workplaces may decrease the likelihood to develop multiple health problems such as chronic stress, anxiety disorders or mental fatigue and anger (Edison, 2016).

For these reasons the SWE participants will have the opportunity of rationalize the work, redesign tools and processes at the end of the day.

2. Method

The representative sample of this study was 17 participants during the simulation practice SWE. The participants were young person’s that are studying the industrial engineering career at UANL University. There are six different kinds of activities that have to be performed at the Lean Manufacturing Laboratory. The participants have to assembly and unassembled cabins, and one of the participants is assigned to supply material to the production lines, see figure.