

# Studying the impact of an at-work exercise program on the operational performance

[Ana Ribeirinho](#), [Ana Cristina Barros](#) and [J. Santos Baptista](#)  
FEUP

## Abstract

This study aims at exploring the relationship between labour exercise and operational performance of factories. In order to achieve this main goal, a study was conducted in one manufacturing company located in the Northern Region of Portugal, where a labour exercise program has been already implemented. Case study methodology was used in order to study the relationship between the use of labour exercise, human resources performance and operational performance. Evidence was collected both from quantitative data retrieved from the company's documentation systems (including the Key Process Indicators (KPI) monitoring archive) as well as from qualitative data collected from managers during company visits. The conclusions drawn show that not sufficient evidence exists to establish a cause-effect relationship between labour exercise practice and operational performance.

**Keywords:** Physical activity; workplace; musculoskeletal disorder; occupational stress; operational performance.

## 1. INTRODUCTION

Human resource practices are important towards achieving superior performance in competitive priorities, such as cost and quality (Ahmad and Schroeder, 2003; Barney and Wright, 1997). Labour exercise is one of such human resource practices. Although significant research exists on labour exercise, it is a topic that has been published mainly in Sport, Health, and Occupational Health and Safety Journals (Amell and Kumar, 2001; Abrams, 2001). Consequently, the analysis of the achievements in human resource performance and operational performance resulting from the labour exercise practice is still missing in the literature. Therefore, this study aims at collecting evidence that supports the direct relation between labour exercise and operational performance.

Towards this objective, there is a need to understand the connection between the three constructs: labour exercise, human resources performance, and operational performance. Literature shows already a relationship between them but in a disconnected way: it is possible to postulate a relation between labour exercise and human resources performance (Amell and Kumar, 2001) and it is possible to do the same between human resources performance and operational performance (Ahmad and Schroeder, 2003). Still the direct relationship between labour exercise and operational performance has been so far not explored in the literature. Towards this end, the research questions addressed in this study are as follows:

- How is the practice of labour exercise combined with the daily activities of manufacturing operations?
- Is there a relationship between the labour exercise practice and operational performance in manufacturing contexts?

## 2. MATERIALS AND METHOD

In order to capture insights on our research questions, a case study in a manufacturing plant that has already implemented a labour exercise program is carried out. The unit of analysis is the manufacturing plant and the sub-unit is the production line.

Visits were carried out in order to meet with Human Resources (HR); Health, Safety and Environment (HSE) and Quality managers and Production supervisors. During these meetings we collected evidence on how and why the labour exercise program was implemented, qualitative data regarding the impact of labour exercise and also support documentation and KPI results for further analysis. Assessment, implementation and maintenance of the labour exercise program were carried out by a physiotherapy service provider. This company was also contacted and provided the preliminary assessment report, as well as the first two evaluation reports for consulting. In summary, the data used to explore the relationships between the use of labour exercise, human resources performance and operational performance was: quantitative data retrieved from the company's documentation systems, KPI (Key Process Indicators) monitoring archive, and qualitative data collected from managers during company visits.

## 3. RESULTS AND DISCUSSION

Table 1 presents a summary of the main results found in the semi-annual report produced by the physiotherapy company. Throughout the evaluation period, the participation rate was high and the amount of workers that perceive improvement with the program is 51%. The evolution of general pain complaints indicates a reduction from 59% to 52%. By comparing soft pain with moderate and strong pain, there was an increase of soft pain complaints and a decrease in moderate pain, while strong pain complaints are equivalent. This may suggest that was an improvement on pain intensity from moderate to soft. However, it can also be noticed that the number of workers evaluated decreased from T0 to T2 (one year later) which can indicate that the severe cases were not there to evaluate and therefore the sample is biased.

We observed that from 2010 to 2011 less 53 employees were in the manufacturing company and there were less 87 evaluations. Absenteeism data is consistent with this information (Figure 1). Unfortunately the company did not provide with 2012 absenteeism data or number of employees so it is not possible to understand if the increase in 2011 was consistent with the increase of complaints and returned to normal or if it is a trend.

Table 1 – Summary of the main findings reported by the external physiotherapy company.

|                                                      | <b>T0</b>                                  | <b>T1</b>                                               | <b>T2</b>                                  |
|------------------------------------------------------|--------------------------------------------|---------------------------------------------------------|--------------------------------------------|
| Analysis time frame                                  | 10/2010 to 03/2011                         | 06/2011 to 09/2011                                      | 12/2011 to 02/2012                         |
| Number of workers                                    | 550                                        | 501                                                     | 463                                        |
| % of women                                           | 34%                                        | 32%                                                     | 30%                                        |
| % of workers with pain symptoms                      | 59%                                        | 58%                                                     | 52%                                        |
| % soft pain complaints                               | 32%                                        | 38%                                                     | 42%                                        |
| % moderate pain complaints                           | 40%                                        | 37%                                                     | 33%                                        |
| % strong pain complaints                             | 28%                                        | 25%                                                     | 26%                                        |
| Hand strength                                        | Above 50% have strength considered healthy | Decrease of the cases with strength very below average. | Above 50% have strength considered healthy |
| % of regular participants in the program             | -                                          | 72%                                                     | 78%                                        |
| % of workers that feel improvements with the program | -                                          | 51%                                                     | 51%                                        |

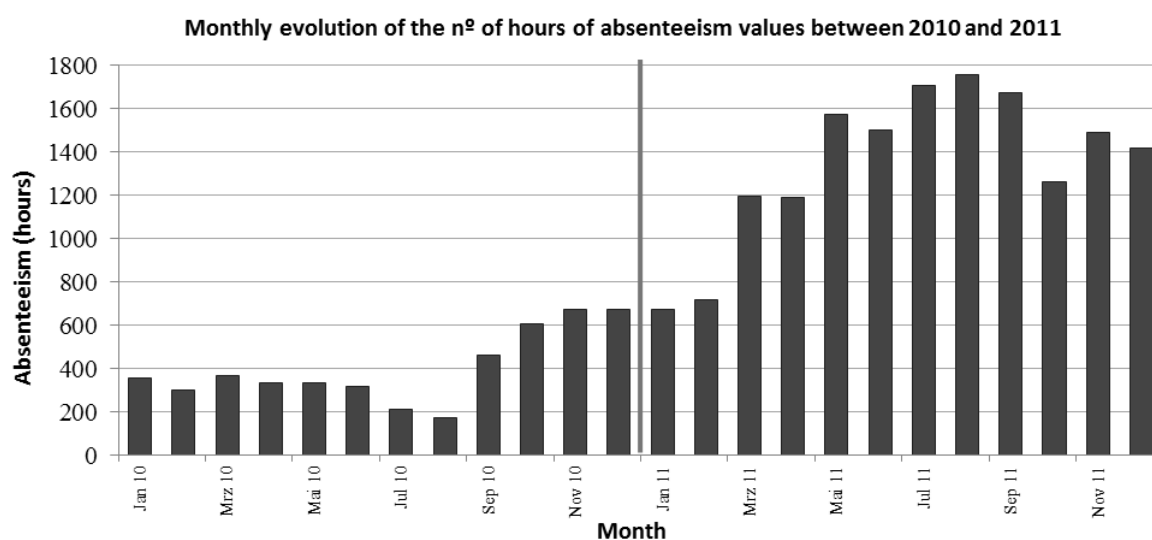


Figure 2 – Monthly evolution of the absenteeism values (hours) between 2010 and 2011.

Figure 2 represents the monthly evolution of the number of reported occupational accidents and incidents from 2010 to 2012. Although there is a decrease, it is not consistent along the timeline, which can indicate other factors contributing to the accidents and incidents evolution.

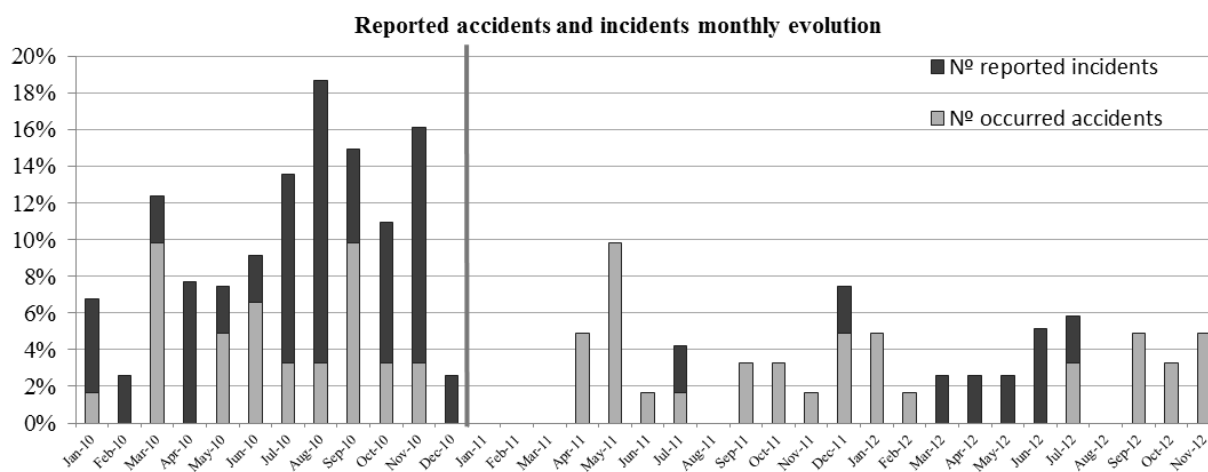


Figure 2 – Monthly evolution of reported accidents and incidents.

Due to the generic nature of the retrieved data, it is not possible to isolate the labour exercise program contribution to the results and consequently to verify if it has impact or not. Therefore, with the data available it is not possible to identify if there is a relationship between labour exercise, HR performance and operational performance.

#### 4. CONCLUSIONS

This study sets out to explore the relationship between labour exercise and operational performance in manufacturing plants.

The retrieved information from the conducted case study is not sufficient to conclude on a cause-effect relationship between labour exercise practice and operational performance. The reasons for the lack of information are: (i) the reported data from the external physiotherapy company is not consistent with the initial goals for the labour exercise program and the monitoring of the program results has not been done in a structured manner; (ii) the company is not monitoring internally the improvements resulting from the program.

As a future work proposal, the implementation of a monitoring tool for the labour exercise results would be suggested: this tool would include a target definition as well as metrics to monitor. If the monitoring were to be carried out in several points in time would be the base for a longitudinal study and for that study a group of control should be identified. It would be interesting to compare the results from those workers who attend the program with a group that do not practice labour exercise. Also, inside the control group is important to separate those who do something else besides labour exercise as a pause and others that do not stop their work.

#### 5. ACKNOWLEDGMENTS

This work is financed by the ERDF – European Regional Development Fund through the COMPETE Programme (operational programme for competitiveness) and by National Funds through the FCT – Fundação para a Ciência e a Tecnologia (Portuguese Foundation for Science and Technology) within project «FCOMP-01-0124-FEDER-037281». The authors would like to thank Master in Occupational Safety and Hygiene Engineering (MESHO), of the Faculty of Engineering of the University of Porto (FEUP), all the support in the development and international dissemination of this work.

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