Ergonomics applied to risk management of musculoskeletal disorders in Clinical Laboratory of Public Hospital.


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Introduction

Musculoskeletal disorders (MSDs) are among the most common problems in Chilean workers (Encla 2011). One of the economic activities with high prevalence of this disorder is the health sector. Thus, the aim of the study was to verify the effectiveness of the implementation of a risk management system for MSDs at Clinical Laboratory in a Public Hospital, Chile. The risk management model used in the study included stages of planning, implementation, monitoring, review and adjustment. In addition, participatory ergonomics principles were used and a multifactorial approach in the stages of risk evaluation and implementation of solutions were also considered.

Method

A descriptive study was conducted to identify potential risk factors and quasi-experimental investigation to assess effectiveness of prevention measurements of MSDs.

a. Risk evaluation: It was recorded all those MSDs that in the last 12 months had generated at least one day of sick leave. A perception survey of musculoskeletal discomfort was also applied (Corlett et al. 1976).

Identification of risk factors: The NIOSH equation was used to identify risk factors associated with manual handling load (Waters et al. 1993). Postural overload was evaluated through the method OWAS (Karhu et al. 1977). For workplace design assessment anthropometric references were used (NCh2639.Of2002). Regarding identification of the risks for upper extremities it was applied the method Rapid upper limbs assessment (McAtamney et al. 1993). The study also considered work organization aspects (Lahera et al. 2002; Gutiérrez et al. 2012).

b. Identification, evaluation and validation of measures of improvement: Based on the risk evaluation methodologies, critical tasks were identified. For such working conditions were analyzed and proposed improvement measures. Meetings and pilot studies were carried out, in order to validate the diagnosis and improvement options.

c. Implementation of measures for improvement: Once improvement measures were defined, these were implemented, monitored and evaluated. For this, a quasi-experimental study was structured, verifying perception related to musculoskeletal discomfort, registered in pre- and post-implementation stages.

Results

a. Risk evaluation: The prevalence of MSDs was 6.5%. Depending on the intensity and the number of regions with musculoskeletal discomfort, there were indentified three units with the most critical conditions. These corresponded to Washing Unit, Tuberculosis Laboratory and Clinical Biochemistry Laboratory.

b. Identification, evaluation and validation of improvement measures: This process is exemplified by some of the measures proposed for Washing Unit.

• Carrying and handling load: The most critical condition corresponded to the task of loading the autoclave with a basket containing 200 tubes and whose weight was 14.6 kg. The measure of improvement was to generate packs of 25 tubes and sterilized in an oven. With this recommendation the NIOSH lifting index decreased from 1.8 to 0.2.
Materials washing: it was proposed supports to increase the height of the washing task, to reduce back bending. On average flexion decreased 31º-12.7º.

Work organization: rotation task were considered to get homogeneous distribution of the workloads.

Kinesiology and training: kinesics therapies in the workplace were proposed, supplemented by training for control of individual risks.

c. Implementation of measures:

The process was evaluated by comparing the prevalence and intensity of musculoskeletal discomfort, among the diagnostic phase and after three months of intervention. Table 1 describes these trends.

Discussion

Risk management of MSDs based on the proposed approach, allowed a significantly reduction in the prevalence and intensity of musculoskeletal discomfort in the Clinical Laboratory staff.

References


Table 1. Number and intensity of musculoskeletal discomfort in pre and post-implementation stages.

<table>
<thead>
<tr>
<th>Musculoskeletal discomfort</th>
<th>Pre-implementation stage</th>
<th>Post-implementation stage</th>
<th>Statistically significant differences</th>
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</thead>
<tbody>
<tr>
<td>Number regions</td>
<td>Mean</td>
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<td>1.9</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.9</td>
<td>1.8</td>
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<tr>
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<td>Mean</td>
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<td>2.7</td>
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<td>SD</td>
<td>2.7</td>
<td>2.3</td>
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