Comparison of Association among Ergonomic and Psychosocial Factors in Office and Field Utility Jobs

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1. Introduction

A cross-sectional study was carried out in a utility company focusing on ergonomic and psychosocial factors, aiming at characterizing association among factors of a diverse nature. The importance of psychosocial work factors in occupational ergonomics and their interplay has been shown, given the constantly changing world of work and organizations (Carayon and Lim, 2006). The study reported in the paper took place in two stages (office workers and fieldworkers assessed separately).

Psychosocial work factors result from the interplay between the work organization and the individual; these factors are multiple and various and are produced by different interacting aspects of work: individual, tasks, technology and tools, environment, and organizational factors (Carayon and Lim, 2006).

2. Method

Given the interest of characterizing the interplay between psychosocial work factors and occupational ergonomics at the company under study, multiple instruments were deployed. In 2012, office workers were assessed using the short version of the Copenhagen Psychosocial Questionnaire (CoPsoQ) (Moncada et al., 2005). Later on, in 2013, field workers of the same company were assessed using the same instrument. The Washington State Department of Labor and Industries (2004) field work ergonomic checklist (WSDLI-FE) (based on Keyserling, Brouwer & Silverstein, 1992) was used as a basis to identify and assess the severity of ergonomic risks in sewage treatment, water treatment and maintenance jobs. Office jobs were assessed for ergonomic factors using Lima and Coelho’s (2011) checklist for work with computers. Additionally, both office and fields workers completed the DASH (2005) questionnaire and were given Corlett and Manenica’s (1980) body map to identify body regions where musculoskeletal pain or discomfort was felt. Association was sought for both professional groups among job psychosocial factors and musculoskeletal complaints.

3. Results

For office workers (n=25), DASH score correlated strongly with work-family conflict, while upper body pain correlated moderately with psychological demands of work. Fieldworkers (n=32) boasted an association between their DASH score and insecurity toward the future (a CoPsoQ subscale), with a moderate correlation. Additionally, physical ergonomic factors were associated with musculoskeletal complaints and psychosocial factors, by means of regression analysis. High determination (above 50%) was obtained for Pain in the upper limbs for office workers (n=32) modelled on postural, equipment and layout ergonomic mismatches and work-family conflict CoPsoQ subscale. For the fieldworkers (n=32), high determination was obtained for the regression of the DASH score, modelled on the Esteem and Work-family conflict CoPsoQ subscales as well as on a subset of awkward postures from the WSDLI-FE checklist (squatting and kneeling). Physical ergonomic factors and psychosocial factors were correlated for both main job families of the company (Table 1 – office workers).

Table 1. Significant associations (Spearman correlations) found for office workers

<table>
<thead>
<tr>
<th>Variable pair</th>
<th>Correlation</th>
<th>p-value</th>
</tr>
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<tbody>
<tr>
<td>DASH score – Work/family conflict</td>
<td>0.58</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Thoracic MSC – Psychological demands</td>
<td>0.40</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Postural ergonomic issues – Insecurity towards future</td>
<td>0.42</td>
<td>p&lt;0.05</td>
</tr>
</tbody>
</table>

legend: MSC - Musculoskeletal Complaints
A moderate association was found for office workers between postural ergonomic mismatches (assessed using Lima and Coelho’s, 2011, checklist for ergonomics in work with computers) and insecurity towards the future CoPsoQ subscale. Associations between ergonomic factors (assessed using the WSDLI (2004) fieldwork ergonomics checklist) and CoPsoQ subscales in the maintenance, sewage and water treatment jobs were rife (these shall be presented in future publications), except for psychological demands and work-family conflicts. In these groups of associations awkward postures and repetitive impacts are the most common ergonomic factors, but others are also present (e.g. vibration in the hand-arm system, high force exerted by the hand, highly repetitive motion, heavy weight lifting).

4. Discussion
In order to characterise the working conditions from both perspectives focused (occupational ergonomics and psychosocial work factors), multiple instruments were deployed to collect data. The interest in using multiple tools to estimate the working constraints and their consequences springs from the goal to design an effective intervention that would ripple across both dimensions positively, and lead to improvements in working conditions.

One of the strongest correlations detected, involved DASH score and work/family conflict, for office workers only. This suggests that working people that have extended chores in their household show symptoms of overexertion, even when only performing administrative tasks at work.

No consistent detailed associations were found across job nature (office workers and field workers show different associations across variables of the two domains under focus). This notwithstanding, taking a higher level of analysis, associations are found for both job natures across all domains studied. For those jobs where more severe ergonomic problems were identified in the utility company (sewage and maintenance) a number of recommendations for improvement were developed, which are being implemented in the company, and involve behavioural interventions at the individual level. These interventions concern the reduction of the ergonomic risk, as identified by the Field Ergonomics checklist, especially for those cases where hazardous postures and operations were detected.

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References