Psychosocial risk factors for shoulder and neck pain among women in service occupations.

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Perceived physical and psychosocial exposure at work, psychological profile, general health and psychosocial stress factors were recorded by questionnaires and interviews in 4 groups of female service workers. Perceived stress, perceived general tension and shoulder and neck pain were recorded every hour during work and leisure. From questionnaires the only variable significantly related to pain was perceived general tension (p<0.0001). Pain level and perceived general tension showed an increase during the workday, and a subsequent reduction in the leisure time. Psychosocial work strain was perceived more demanding than biomechanical work strain. The interviews showed that professional and social relationships perceived as the most important exposure factor for fatigue development.

1. Introduction and objective
Risk factors for shoulder and neck pain have been an objective under study in our laboratory for many years. The last years occupations with low biomechanical load and with psychosocial stress have been studied. Although the biomechanical load is low and total muscle activity level and muscle rest measured by electromyography are too low to predict muscle pain, the prevalence of pain in shoulder and neck can be at the same level as for occupations with high biomechanical load.

The results presented here are a continuation of a study on service occupations and are in part follow-up results of an intervention. The pre-intervention results showed a strong correlation between pain and perceived general tension. There was no correlation between pain and variables that characterised the psychosocial work environment (Vasseljen et.al. submitted). The muscle activity level was low and showed no correlation with pain.

The lack of significant correlations between pain and psychosocial work factors prompted a change to a qualitative study design in the post-intervention data collection. This design was chosen to give the subjects the possibility to use more open descriptions of work demands as well as demands in their lifesituation. Another change was an hourly registration of pain, perceived general tension and perceived stress, which also included the leisure time. The observations in the follow-up therefore consist of registrations over 24 hours.

Results from the follow-up study, based on questionnaires and interviews will be presented.

2. Material and method
2.1. Sample
A cross-sectional study of female workers with and without shoulder and neck pain in a shopping center (n=21), in health care (n=20), in banking (n=27) and secretaries (n=26) was performed (n = 94).

To be included as pain-afflicted in the sample, a symptom level of 3 or higher on a scale from 0 to 6, incorporating level and pattern of pain, was required (Westgaard and Jansen, 1992). A symptom level of 3 indicates frequent episodes of pain of moderate intensity or short severe episodes. The index classified 38 as pain-afflicted.
2.2. Questionnaires

Questionnaires recorded perceived physical and psychosocial exposure at work, psychological profile, general health and psychosocial stress factors. Questions relating to perceived physical and psychosocial stress at work were mostly scored on 10-cm visual analog scales (VAS) with end phrases ”very unsatisfied” and ”very satisfied”. Self-evaluation of economy, family relations, duties and mental health were scored on VAS-scale with end points ”very good” and ”very poor”. Perceived general tension was rated on VAS scale from ”very low” to ”very high” as end points. Responses to sleep, exercise and general mood were scored on categorical scales.

To identify whether fatigue, stress or tension, in the subjects own opinion were mostly influenced by physical or psychosocial demands, general questions on mental, social and biomechanical exposures during work and leisure time were included. The answers were scored on a VAS-scale with end points ”of no significance” and ”of high significance”.

2.3. Hourly questionnaires

Perceived stress, perceived general tension and shoulder and neck pain was recorded every hour during work and leisure time on a VAS scale. The end points on the VAS-scale were ”very high” and ”very low”.

2.4. Interviews

The interview was conducted using an interview guide with 17 open-ended questions. Physical and psychosocial issues, both occupational and in private life were included. The questions were formulated to gain insight into the employer’s own perception of their environment and demanding factors that could be related to health. Each interview lasted about one hour. The interviews were tape recorded and transferred to text files.

2.5. Statistical methods

In compliance with the distribution of the observations, either unpaired t-test or Mann-Whitney U-test was used to test differences between the groups with and without neck and shoulder pain. Comparisons were performed two-tailed and differences were considered significant at the p<0.05 level. Chi-square statistics were used for dichotomised data.

Logistic regression was used to examine association between pain status (dependent variable) and exposures and/or individual variables (independent variables).

3. Results

3.1. Questionnaires

The results from the questionnaires are reported in table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pain/no-pain</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived general tension</td>
<td>5.29/2.93</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Load variation</td>
<td>4.28/5.6</td>
<td>0.03</td>
</tr>
<tr>
<td>Self-realization</td>
<td>4.70/5.89</td>
<td>0.04</td>
</tr>
<tr>
<td>EPQ-N</td>
<td>9.22/7.63</td>
<td>0.09</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>7.89/8.39</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Perceived general tension, as measured on a VAS-scale, proved again to be strongly associated with shoulder and neck pain (p<0.0001). Load variation (p=0.03) and self-realisation (p=0.04) was also related to pain status. A logistic regression analysis was carried out, with shoulder and neck pain as the dependent variable and the variables of table 1 as independent variables. Perceived general tension was the only variable allowed in the regression equation (R²=0.21 p=0.001). It classified correctly 75% of the individuals.

3.2 Hourly questionnaires

Figure 1 presents changes in shoulder and neck pain and perceived general tension from hour to hour during the workday and the leisure time. Both variables showed a significant increase during the workday. This trend was significantly reversed in the leisure time.
The exception was shoulder and neck pain for the no-pain group, who reported a low and stable pain level.

Hourly questionnaires

Figure 1: Development of pain in shoulder and neck (panel A) perceived general tension (panel B) during the workday and in leisure time for both pain and no-pain group.

The results of the self-report of significant factors for feeling fatigued, stressed or tensed is presented in figure 2. The figure shows that mental/social job strain was perceived more important than biomechanical job strain in the development of fatigue. This was the case both for those with and those without shoulder and neck pain.

Psychosocial vs. biomechanical strain

Figure 2: Most demanding strain: Mental/social vs. biomechanical strain for the pain and no-pain groups.

Table 2: The most demanding psychosocial factors in the work environment for those with and those without shoulder and neck pain. The table shows the distribution of answers. If several factors were perceived very demanding, several scoring alternatives were allowed.

<table>
<thead>
<tr>
<th>Psychosocial demands</th>
<th>Pain (n=23)</th>
<th>No pain (n=35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional and social relationships</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Organisational changes</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Administrative responsibility</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Time pressure</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Job influence</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Demands of skills upgrading</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Lack of challenges</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Work distribution</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Satisfied</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

3.3. Interview

The interviews have at this time only been analysed for 58 subjects. Table 2 shows the results from the interview for health care, shopping center and bank employees. Professional and social relationships, which include relationship to any of colleagues, supervisors, clients and customers, were perceived as the most demanding psychosocial factor. Each professional group showed the same tendency. In addition, many other causes to psychosocial strain were identified.

4. Discussion

Our results show:
1) The pain group shows pain development over the workday that is reversed during the leisure time.
2) Perceived general tension is significantly increased during the workday both for those with and those without pain. The tension level is reduced during the leisure time.
3) Psychosocial strain is perceived as the most demanding type of strain, however, the psychosocial variables do not distinguish the pain and the no-pain groups.
4) When the subjects are given the possibility to identify their most demanding exposures in their own words a multitude of different factors is reported.

The results show that work-related psychosocial demands are of significance for the development of shoulder and neck pain. But still it is difficult to find variables that distinguish those with shoulder and neck pain from those without shoulder and neck pain. We suggest several reasons for this. The questionnaires could simply ask the wrong questions and lack specificity to identify the actual demands existing in the context observed.

The perception of the environment and the demands is individually different and context dependent. Each individual will have their own interpretation of the environment, which makes it difficult to find risk factors on a group level.

It is not the demand but the way each individual is coping with the demand that counts. Perceived general tension may therefore be the better variable to detect exposure to strenuous psychosocial factors, as it may consider individual reactions and coping strategies related to environmental demands. Thus, the increase in tension during the workday for the no-pain group may indicate that the no-pain group also is subject to potentially harmful psychosocial exposures.

Earlier research on work related pain has predominantly focused on work-related risk factors. The total amount of demands from work and family, friends and society can be a trigger for musculoskeletal disorders. These demands will change in place and time. It is also clear that lack of demands or lack of challenge can be a problem.

In conclusion, the workday induces shoulder and neck pain, which is reversed in leisure time, for the service workers in this study. The pain is associated with perceived general tension, which shows an increase during the workday and a reversal during leisure time.

Psychosocial work strain appears to be the most important strain, but those with and without pain are not distinguished by our psychosocial variables. A possible reason is the multitude of different demands as a cause of strain.

References