Risk factors for musculoskeletal disorders among employees of a call center in Iran and its relation to workload

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INTRODUCTION

- Musculoskeletal disorder (MSD): a disorder of the muscles, nerves, joints, tendons, and spinal discs
- Not an acute injury, rather a chronic disease developing over time
- More than 30% of all occupational injuries are musculoskeletal injuries associated with manual tasks
- Call center employees exposed to working conditions with higher risk of developing MSD

OBJECTIVE

- Evaluation of the risk factors of musculoskeletal disorders (MSDs) and its relation to employees’ workload at a call center in Iran

METHODS

- Cross-sectional study by conducting surveys of all employees (25 women and 15 men) of a call center at Sanandaj, Iran, in 2014
- Standard Nordic Musculoskeletal Questionnaire (NMQ) used to study prevalence of musculoskeletal symptoms
- NASA Task Load Index (NASA-TLX), a subjective and multidimensional tool, used to assess employees’ workload
- Rapid Office Strain Assessment (ROSA) used for evaluating the ergonomic risk factors at the workspaces
- SPSS version 16 used for analyzing data.

RESULTS

- Age average was 34±7, average years of service was 8±3
- 37.5% of employees worked at morning shift, 25% at afternoon/evening shift, and 37.5% at night shift
- Body mass indexes (BMI) of the employees were: 52.5% normal, 35% overweight, and 12.5% obese.
- ROSA average scores: 5±0.72. 80% in “caution zone” (3-5) and 20% in “hazard zone” (>5).

Prevalence of musculoskeletal symptoms at nine regions of the body

<table>
<thead>
<tr>
<th>Region of the body</th>
<th>Neck</th>
<th>Shoulder</th>
<th>Elbow</th>
<th>Wrist</th>
<th>Upper Back</th>
<th>Lower Back</th>
<th>Hip</th>
<th>Knee</th>
<th>Ankle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of symptoms (%)</td>
<td>77.5</td>
<td>60</td>
<td>27.5</td>
<td>55</td>
<td>67.5</td>
<td>72.5</td>
<td>35</td>
<td>42.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Rating of NASA-TLX six subscale for workload assessment

<table>
<thead>
<tr>
<th>Mental demand</th>
<th>Physical demand</th>
<th>Temporal demand</th>
<th>Performance</th>
<th>Effort</th>
<th>Frustration</th>
<th>Total workload</th>
</tr>
</thead>
<tbody>
<tr>
<td>74.75</td>
<td>53.25</td>
<td>53.22</td>
<td>55.25</td>
<td>70.67</td>
<td>74.25</td>
<td>68.38</td>
</tr>
</tbody>
</table>

Relationship between the prevalence of musculoskeletal disorders with multiple factors based on extracted p-value

<table>
<thead>
<tr>
<th>Gender</th>
<th>Years of service</th>
<th>Work shift</th>
<th>BMI</th>
<th>ROSA score</th>
<th>Workload risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>0.045</td>
<td>0.0001</td>
<td>0.1</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
<tr>
<td>Shoulder</td>
<td>0.051</td>
<td>0.0001</td>
<td>0.02</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
<tr>
<td>Elbow</td>
<td>0.1</td>
<td>0.05</td>
<td>0.52</td>
<td>0.07</td>
<td>0.52</td>
</tr>
<tr>
<td>Wrist</td>
<td>0.25</td>
<td>0.45</td>
<td>0.15</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Upper Back</td>
<td>0.005</td>
<td>0.0001</td>
<td>0.02</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
<tr>
<td>Lower Back</td>
<td>0.03</td>
<td>0.001</td>
<td>0.02</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
<tr>
<td>Hip</td>
<td>0.05</td>
<td>0.05</td>
<td>0.075</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knee</td>
<td>0.0001</td>
<td>0.02</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ankle</td>
<td>0.1</td>
<td>0.07</td>
<td>0.42</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

- High prevalence of musculoskeletal disorders seen among employees of the call center especially in lower back and neck
- Improper workplace lacking work standards (high ROSA scores)
- Higher ROSA score: higher MSDs risk
- Higher BMI: higher MSDs risk
- Women were more likely than men to develop MSDs (men-oriented workplace design)
- The risk of MSDs increased with age and years of experience: effect of cumulative exposure

Suggestions:

- Improving workplace to provide convenience for employees
- Educational workshops on ergonomics for employees with special focus on sitting posture
- Utilizing interventional strategies for reducing workload

KEY REFERENCES


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