Evidence of worksite physical exercise training to promote health in jobs ranging from low to high occupational physical demands

Gisela Sjøgaard
Professor
Institute of Sport Science and Clinical Biomechanics
Faculty of Health Sciences
University of Southern Denmark
gsjogaard@health.sdu.dk
Introduction

- Conflicting results have been presented regarding the effectiveness of worksite physical exercise training on health promotion
- This is true within jobs with low as well as high occupational physical demands
- Evidence is in particular lacking for jobs with high loads
### Methods

- In Denmark several research groups combined forces
  - conducted 9 studies with RCT design
  - using the same basic intervention of offering
- One hour per week supervised physical exercise training at the worksite during working hours according to the concept “Intelligent Physical Exercise Training” that is
  - based on evidenced sports sciences training principles
  - tailored to work exposure, employee health, and physical capacity
- The studies enrolled ~ 2500 workers, lasted 12 – 52 wks
  - Questionnaire surveys and health checks were performed at baseline and follow-up.
The interventions
Dynamic resistance training
Bicycle exercise
- Strengthening exercises:
  - Reverse flyers
  - Shrugs
- Endurance exercises:
  - Static pull in 8 directions
  - Bodyblade

(www.sdu.dk/f16pilots)
# Individual exercise protocol

## 3 exercises per body region

<table>
<thead>
<tr>
<th>Hip/knee</th>
<th>Step-up</th>
<th>Static lunges</th>
<th>Hip adduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Pas</td>
<td>Instructor present? (mark X)</td>
<td>Number of repetitions</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>/</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>/</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neck/shoulder</th>
<th>Lateral raise</th>
<th>Rows</th>
<th>Shrigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Pas</td>
<td>Instructor present? (mark X)</td>
<td>Number of repetitions</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>/</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>/</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abd/back</th>
<th>Crunch</th>
<th>Back extension</th>
<th>Plank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Pas</td>
<td>Instructor present? (mark X)</td>
<td>Number of repetitions</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>/</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>/</td>
<td>20</td>
</tr>
</tbody>
</table>
Methods

The job groups included:

- office workers,
- computer workers,
- industrial technicians,
- cleaning personnel,
- health care workers,
- construction workers,
- fighter pilots.
Results: Musculoskeletal disorders 1

- Neck pain was reduced among
  - office and computer workers,
  - industrial technicians,
  - health care workers
  - fighter pilots

Hand, forearm, or elbow pain was reduced among office and computer workers and industrial technicians. 


Low back pain was reduced among office and computer workers.

Results: Cardio-metabolic risk indicator

- Increased aerobic capacity (absolute/relative)
  - **Office and computer workers**

- **Health care workers**

- **Construction workers**
Results: Other physical capacities

- Increased muscle strength
  - office/computer workers
  - cleaners


- Improved balance control
  - cleaners

Results

- In all job groups significant improvements were documented regarding health outcomes and/or health risk indicators.

- The improvements were in the order of 10 – 50 % and considered of clinical relevance.

- These outcomes were job group specific and dependent on the individual training program.
Discussion

Three essential factors characterized these interventions which made them distinct from a number of unsuccessful interventions:

1) Physical exercise training was performed during working hours one hour per week, usually divided into 2-3 training sessions. Regular adherence was only ~ 60% (31 – 86)

2) Sports exercise training specialists were involved in designing specific exercise training programs individually for each job group, they were evidence based and of general high intensity. Supervision of training performance quality is expensive

3) Training sessions were regularly supervised by expert trainees in the field, training diaries filled in, and adherence was monitored. Self-monitoring features can increase motivation
Take home message

- It is remarkable that in every study group outcomes of improved health were documented and the effect sizes were of clinical relevance.

- It is concluded that worksite exercise training does enhance health if a program with evidenced efficacy is implemented by expert trainees with support of the employer.

- Preliminary cost effectiveness estimates indicate acceptable cost relative to societal savings on health expenses.