The Effects of a Workplace Exercise Intervention: A Field Experiment in China

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The Chinese Context

- Chinese working population - 74.4% of 1.35 billion
- Limited research to date Siu et al, 2013
- Relevance of western health promotion approaches
- Historical context – ‘Radio callisthenics’
Workplace Exercise

• Definitions
  – Physical activity  Caspersen et al, 1985
  – Exercise
  – Workplace  Quintilliani et al, 2007

• Effects of physical activity on individuals

• Workplace physical activity interventions

• Workplace exercise interventions – weekly aerobics, short exercise break, individual exercise prescription, 30min to 2hrs per week
Objectives

• Investigate effects on employees
  – Health and psychological effects
  – Level of physical activity

• Investigate effects on organisation
  – Job satisfaction, organisation commitment, staff engagement, recruitment and retention
  – Work performance
  – Sickness absence
Method

1. Feasibility study
2. Employee participative management
3. Pilot group study
4. Experimental vs Wait-list Control
5. Pre & post comparison - longitudinal design
6. Process evaluation using the RE-AIM framework
   
   *Kim et al, 2012; Aittasalo et al, 2012*
Setting & Participants

• Insurance information technology service provider:
  • Guangzhou (N = 440) Beijing (N = 250)
• Sedentary IT workers - more prone to musculoskeletal problems Barredo & Mahon, 2007
• Age range 21-40
• 90% university graduates
• 51% male, 49% female
Intervention

• Qigong - 10 minutes, twice a day, in the workplace

• Pop-up window alerts or led by ‘exercise champions
“Move It 动起来” Workplace Exercise Intervention Programme
Measures

Self-reported data:

– Physical activity levels (*International Physical Activity Questionnaire, IPAQ, short form*)

– Work performance (*WHO Health and Work Performance Questionnaire: HPQ*)

– Sickness absence (*Work Ability Index, WAI*)
## Design

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<th>4th mths</th>
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<td><strong>Time 1</strong></td>
<td>Measures n = 191</td>
<td>12 wks intervention</td>
<td>On-going exercise</td>
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<td>Group - Guangzhou</td>
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<td>On-going exercise</td>
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<td>Group - Guangzhou</td>
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<td><strong>Time 4</strong></td>
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<td><strong>Wait-list Control</strong></td>
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<td>Group - Beijing</td>
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<td>Measures</td>
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### Study 1
- Pre and post comparison T1 vs T2, within groups and between groups

### Study 2
- Longitudinal study T1 vs T3, within groups and between groups
Results

• Demographic analysis

• Effects on employees
  ➢ Level of physical activity

• Effects on work-related outcomes
  ➢ Work performance
  ➢ Sickness absence
# Demographics: Comparable

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<tr>
<th></th>
<th>Experimental Group</th>
<th>Wait List Control Group</th>
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<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>50% W 50% M</td>
<td>45% W 55% M</td>
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<tr>
<td><strong>Age</strong></td>
<td>92% 21 - 40</td>
<td></td>
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<tr>
<td><strong>Years of Employment</strong></td>
<td>50% ≤ 3 years</td>
<td>60% ≤ 3 years</td>
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Demographics: Different

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<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Wait List Control Group</th>
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<tbody>
<tr>
<td><strong>Education</strong></td>
<td>87% university graduates</td>
<td>99% university graduates</td>
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<tr>
<td><strong>Marital Status</strong></td>
<td>61% married</td>
<td>75% married</td>
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Effect on Employees

Significant in Physical Activity Levels

Experimental group
• pre and post T1 vs T2 comparison
• longitudinal T1 vs T3 comparison

Wait-list control group
• longitudinal T1 vs T3 comparison
Comparison in Physical Activity between Groups - Median Scores (weekly METs)

- Pre-study T1
- Post-study T2
- Post-study T3

Experimental Group
Wait-list control group
Magnitude of ↑ in Physical Activity Levels Between Two Groups

△ Pre and post T1 vs T2 comparison
Experimental group 36% > Wait list control group 22%

△ Longitudinal T1 vs T3 comparison
Experimental group 46% > Wait list control group 13%

% based on the median of physical activity levels due to non-normal distributions of scores for both groups
Effect on Work Performance

1. Pre and post T1 vs T2 comparison
2. Longitudinal T1 vs T3 comparison

- No significant difference within the experimental group
- No significant difference within the wait-list control group
- No significant difference between two groups although wait-list control group had higher mean scores
Comparison in Work Performance (1-10) between Two Groups in Mean Scores

- **Experimental Group**
- **Wait-list Control Group**

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<tr>
<th>Time</th>
<th>Experimental Group</th>
<th>Wait-list Control Group</th>
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<tbody>
<tr>
<td>Pre-study T1</td>
<td>6.4</td>
<td>6.6</td>
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<tr>
<td>Post-study T2</td>
<td>6.8</td>
<td>7.0</td>
</tr>
<tr>
<td>Post-study T3</td>
<td>7.2</td>
<td>7.4</td>
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Effects on Sickness Absence

1. Pre and post T1 vs T2 comparison
2. Longitudinal T1 vs T3 comparison

• No significant difference within the experimental group
• No significant difference within the wait-list control group
• No significant difference between two groups
Experimental Group T1, T2 & T3
Sickness Absence Outcomes in %

- None at all
- At the most 9 days
- 10-24 days
- 25-99 days

- Pre-study T1
- Post-study T2
- Post-study T3
Wait-list Control Group T1, T2 & T3
Sickness Absence in %

- None at all
- At the most 9 days
- 10-24 days
- 25-99 days
- 100-365 days

Pre-study T1
Post-study T2
Post-study T3
RE-AIM Process Evaluation Model

- **Reach**: 50% participation rate, employee profiles
- **Effectiveness**: survey results
- **Adoption**: focus group interviews
- **Implementation**: exercise logs, focus groups
- **Maintenance**: integrate to company practice
Significance

- Short exercise breaks as incorporated into company practice *Dishman et al, 2009*
- Provide further evidence in Chinese context
- Lessons from the West to the East and vice versa
More Research Needed …

• Organisational outcomes  
  *Odeen et al, 2013*
• Higher quality methodological approaches
• Explore effects with different delivery modalities
• More studies with employees doing prolonged sedentary work

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References


References


