Overcoming the challenges of randomised trials of musculoskeletal pain

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Introduction

- RCTs – appropriate method to evaluate PT interventions (high internal validity)

- Designing trials that are relevant to clinical practice is challenging (how to optimise external validity)

- Two issues:
  - therapist effects (competencies, skills)
  - beliefs, expectations, preferences

- How can we address these issues in RCTs?
1. Therapist effects - risk of contamination

- Assumption of RCTs: prognostic similarity at baseline
  - patients: e.g. duration and severity of musculoskeletal pain
  - therapists: skills, competencies, experience

- Complex interventions
  - therapists may need training to provide intervention
  - therapists may have particular interest in one intervention

- Randomisation solves problems regarding baseline similarity
  - randomisation at patient level: therapists deliver more than one intervention: risk of contamination?
  - randomisation at therapist level: cluster-randomisation
Cluster-RCT: example

Therapists (GPs)

Training

patient selection

Minimal psychosocial intervention

Patient outcomes
Costs

R

patient selection

usual care (national guidelines)

Patient outcomes
Costs
Cluster-randomised controlled trials

- **Advantages**
  - no risk of contamination
  - similarity between intervention groups regarding experience, skills, beliefs of therapists

- **Challenges**
  - baseline similarity of patients?
  - selection of patients preferably carried out by independent researcher team (not therapists themselves)
  - ethical issues
  - effects of clustering within therapists
Therapist effects - influence on outcome

- Within intervention groups
  - variation in enthusiasm, skills & competencies of therapists
  - variation in beliefs, attitudes, and expectations of therapist
  - therapist-patient interaction

- Outcome may vary across therapists
  - effects of clustering of patients within therapists / practices
  - explore therapist effects / adjust for in analysis

- Process evaluation
  - measure skills, attitudes, beliefs
  - measure content of therapy
II. Expectations and preferences

- Positive beliefs and expectations (patients and therapists) may enhance non-specific effects

- Important in pragmatic trials (no blinding of patients, subjective outcomes)

- When allocated to the non-preferred treatment:
  - resentful demoralisation
  - drop-out, non-compliance
  - relatively poor results
### Example 1: shoulder pain - NL

<table>
<thead>
<tr>
<th></th>
<th>Injections (n=52)</th>
<th>Physiotherapy (n=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>77%</td>
<td>46%</td>
</tr>
<tr>
<td>No preference</td>
<td>80%</td>
<td>47%</td>
</tr>
<tr>
<td>Randomised to preferred Tx</td>
<td>85%</td>
<td>53%</td>
</tr>
<tr>
<td>Not randomised to preferred Tx</td>
<td>64%</td>
<td>50%</td>
</tr>
</tbody>
</table>

- Treatment preferences seem to influence outcome, but more for injections than for physiotherapy
- Small numbers ...
Example 2: shoulder pain - UK

- Having a preference positively influences outcome, regardless if preferences are met
- Good outcomes lead to stronger preferences

<table>
<thead>
<tr>
<th>Good functional outcome 6 months</th>
<th>Injections (n=104)</th>
<th>Physiotherapy (n=103)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No preference</td>
<td>42%</td>
<td>54%</td>
</tr>
<tr>
<td>Preference</td>
<td>59%</td>
<td>64%</td>
</tr>
</tbody>
</table>
Challenges

- Patients with strong preferences often do not consent to randomisation
  - influence of strong preferences cannot be studied
  - difficult to generalise results of RCTs

- Alternative designs
  - complex
  - require large numbers
  - do not completely solve the problem
Comprehensive cohort design (Ricker / Wennberg)
Patient preference design (Brewin & Bradley)
Summary & conclusions

- Variation in skills & competencies of therapists may influence outcome (therapist effects)
- Patient preferences & expectations may influence outcome
- Influences of these issues can be addressed within the framework of RCTs
  - use alternative designs (e.g. cluster-randomisation)
  - measure all relevant factors during the trial
  - explore potential influences (process evaluation)
Thank you