Psychosocial determinants of sedentary behaviour patterns in patients with Rheumatoid Arthritis: A Self-Determination Theory perspective

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Background

**Topic**
Sedentary behaviour

**Population**
Rheumatoid Arthritis

**Behaviour change**
Background: What is sedentary behaviour?

Sedentary behaviour = Sitting/reclining/lying, awake, low energy expenditure
Too much sitting can increase risk of:

- Inflammation
- Heart Disease
- Type 2 Diabetes
- Physical function
- Quality of life
- Psychological wellbeing

Health risks can occur REGARDLESS of how much moderate-to-vigorous intensity physical activity you might do.
Background: Rheumatoid Arthritis

<table>
<thead>
<tr>
<th>What?</th>
<th>Chronic autoimmune disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why?</td>
<td>The immune system attacking synovial joints of the body</td>
</tr>
<tr>
<td>Where?</td>
<td>Pain, stiffness and swelling in synovial joints of the body</td>
</tr>
<tr>
<td>Who?</td>
<td>1% of the UK affected</td>
</tr>
</tbody>
</table>

Due to pain and functional disability, people with Rheumatoid Arthritis are at increased risk of leading a sedentary lifestyle...

...this might put them at further increased health risks

Fenton et al. (2017), *Rheumatology (Oxford)*

Few studies have examined levels of sedentary behaviour in this population.
Cyclical relationship

Psychosocial determinants?

Pain
CVD
Depression

Sedentary behaviour

Inflammation

Fenton et al. (2017)
Determinants of sedentary behaviour?

Self-Determination Theory (Deci & Ryan, 1987)

Quality of motivation

- Intrinsic Regulation
- Identified Regulation
- Introjected Regulation
- External Regulation
- Amotivation

Autonomous

Controlled
Study aims

• To determine the *levels of sedentary behaviour* and accumulation of sedentary behaviour with the activPAL in people living with Rheumatoid Arthritis

• Examine cross-sectional relationships between quality of motivation for...

1) increasing physical activity
2) reducing sedentary behaviour
3) breaking up sedentary behaviour

...with *stepping, sitting/lying and standing* amongst people with Rheumatoid Arthritis
Methodology

Visits to hospital
- Height and weight
- Percent body fat
- Blood pressure
- Fasted blood sample
- DAS-28 (joint assessment)

Behavioural Regulation in Exercise Questionnaire

I aim to reduce my sedentary behaviour...

<table>
<thead>
<tr>
<th>Quality of motivation</th>
<th>Example from questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Regulation</td>
<td>“Because it is fun”</td>
</tr>
<tr>
<td>Identified Regulation</td>
<td>“Because I value the benefits of reducing my sedentary behaviour”</td>
</tr>
<tr>
<td>Introjected Regulation</td>
<td>“Because I feel guilty when I am not reducing my sedentary behaviour”</td>
</tr>
<tr>
<td>External Regulation</td>
<td>“Because other people say I should”</td>
</tr>
</tbody>
</table>
Methodology

7 days - assessment of sedentary behaviour using activPAL
Results: Aim 1

Average daily hours of sitting/lying, standing and stepping

- **Sit/lie (hours)**
  - Mean: 7.9 ± 1.5 hours

- **Stand (hours)**
  - Mean: 4.2 ± 1.1 hours

- **Stepping (hours)**
  - Mean: 1.8 ± 0.7 hours

**Sit to stand movements**
- Daily average: 42.5 ± 9.9

**Wear time**
- Daily average: 13.9 ± 0.8 hours
## Results: Aim 2

**Statistical Analysis:** Linear regressions (adjusted for wear time)

<table>
<thead>
<tr>
<th></th>
<th>Autonomous motivation</th>
<th>Controlled motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical activity</strong></td>
<td>Positive relationship</td>
<td>Negative relationship</td>
</tr>
<tr>
<td></td>
<td>= More stepping</td>
<td>= Less stepping</td>
</tr>
<tr>
<td></td>
<td>.465*</td>
<td>.462*</td>
</tr>
<tr>
<td><strong>Reducing sedentary behaviour</strong></td>
<td>Positive relationship</td>
<td>Positive relationship</td>
</tr>
<tr>
<td></td>
<td>= More stepping</td>
<td>= More sitting/lying</td>
</tr>
<tr>
<td></td>
<td>.460*</td>
<td>.634**</td>
</tr>
<tr>
<td></td>
<td>Negative relationship</td>
<td>Negative relationship</td>
</tr>
<tr>
<td></td>
<td>= Less standing</td>
<td>= Less standing</td>
</tr>
<tr>
<td></td>
<td>−.558*</td>
<td>−.558*</td>
</tr>
<tr>
<td><strong>Breaking up sedentary behaviour</strong></td>
<td>No significant relationship</td>
<td>Positive relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= More sitting/lying</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.615**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative relationship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>= Less standing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>−.543*</td>
</tr>
</tbody>
</table>

**Note:** Values represent path coefficients (β). * $p < .05$, ** $p < .01$. **Green text** = beneficial association. **Red text** = adverse association.
Conclusion

People living with Rheumatoid Arthritis spend long periods of the day sitting

- Approximately 8 hours
- This is comparable to past research estimating sedentary time with accelerometers in Rheumatoid Arthritis and other populations ‘at risk’ of sedentariness (e.g., older adults)
  - Gilbert et al. (2016), *Journal of Physical Activity and Health*
  - Yu et al. (2015), *Arthritis Research & Therapy*
  - Harvey et al. (2015), *Journal of Aging and Physical Activity*

Autonomous motivation to engage in physical activity demonstrates a beneficial association with daily time spent stepping in people living with Rheumatoid Arthritis

- Aligned with previous research in other populations (e.g., older adults, overweight women)
  - Kirkland et al. (2011), *Activities, Adaptation & Aging*
  - Silva et al. (2011), * Medicine & Science in Sports & Exercise*

- Fostering autonomous motivation for physical activity in the Rheumatoid Arthritis population might help to promote higher levels of physical activity engagement, although we do not know of what intensity
Conclusion

Controlled motivation to engage in physical activity demonstrates an adverse relationship with daily time spent stepping in people living with Rheumatoid Arthritis

- Reducing controlled motivation to engage in physical activity may be of some benefit to this population with regards to their physical activity engagement

Controlled motivation to reduce AND break up sedentary behaviour is adversely related to the amount of time spent sitting and standing

- Decreasing controlled motivation towards reducing and/or breaking up sedentary behaviour may help to lessen sedentary behaviour in people living with Rheumatoid Arthritis

Autonomous and controlled motivation ARE NOT opposites – likely to have unique effects on targeted behaviour

- Increasing autonomous motivation for physical activity/reducing sedentary behaviour, in combination with reducing controlled motivation for reducing and/or breaking up sedentary behaviour, may have the potential for the greatest effects

- Cross-sectional study
Thank you!

Questions?

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