Is the presence of sedentary behaviour or the absence of physical activity responsible for fat mass and appetite dysregulation? Preliminary results from the DAPHNE project.

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Is the presence of sedentary behaviour or the absence of physical activity responsible for fat mass and appetite dysregulation? Preliminary results from the DAPHNE project.

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Background

• It is well established that moderate-to-vigorous physical activity (MVPA) contributes to the prevention of non-communicable diseases. More recently, sedentary behaviour has been linked with deleterious health outcomes independent of the amount of MVPA performed1, 2.

• Sedentary behaviour has also been linked to unhealthy dietary intake but little is known about the association between objectively measured sedentary behaviour and appetite control3.

Aim

• The present study employed an innovative validated device for the objective measurement of sedentary and active behaviour to investigate whether measures of sedentary and active behaviours were associated with body composition or appetite dysregulation.

Methods

• 58 participants (13 males, 45 females) visited the Human Appetite Research Unit on two occasions (age 37.0 ± 13.8 years, BMI 28.6 ± 4.9).

Visit 1:

Bed and breakfast anthropometrics  
PA and SB questionnaires  
Appetite questionnaires  
Remove SenseWear and collect PA diary

7 days measurement of free-living physical activity

Visit 2:

Psychological well-being questionnaires  
PA and SB questionnaires  
Fitness test  
Remove SenseWear and collect PA diary

Table 1. Measurement methods.

Free-living PA  
Body composition  
Cardiovascular fitness  
Resting metabolic rate  
Appetite dysregulation

Measurement method  
SenseWear mini  
Bodpod  
Indirect calorimetry  
Indirect calorimetry  
Three-Factor Eating Questionnaire; Binge Eating Scale

Results

• Sedentary behaviour was positively associated (r = 0.4 - 0.47, p <0.05) and MVPA negatively associated (r = -0.52 - -0.71, p <0.01) with multiple indices of adiposity.

• After controlling for MVPA the correlations between sedentary behaviour and adiposity were no longer significant, however when the correlations between MVPA and adiposity were adjusted for sedentary behaviour they remained significant.

Table 2. Correlation between active and sedentary behaviours and indices of adiposity.

<table>
<thead>
<tr>
<th>Body mass</th>
<th>BMI</th>
<th>Fat mass</th>
<th>% fat mass</th>
<th>WC</th>
<th>Sed 1</th>
<th>MVPA 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disinhibition</td>
<td>0.51†</td>
<td>0.68†</td>
<td>0.65†</td>
<td>-0.61†</td>
<td>-0.60†</td>
<td>-0.52†</td>
</tr>
<tr>
<td>Binge eating</td>
<td>0.45†</td>
<td>0.50†</td>
<td>0.53†</td>
<td>0.49†</td>
<td>0.52†</td>
<td>-0.18 -0.08</td>
</tr>
</tbody>
</table>

n=58; data are Pearson correlations (r). 1 controlled for % fat mass (n=55). p<0.01. Waist circumference (WC); SED (sedentary behaviour); energy expenditure (EE).

• Higher levels of adiposity were associated with higher levels of TFEQ Disinhibition and Binge Eating. However there was no association between physical activity and sedentary behaviour with appetite dysregulation after controlling for adiposity.

Table 3. Correlation between indices of adiposity, active and sedentary behaviours and appetite dysregulation.

<table>
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n=58; data are Pearson correlations (r). 1 controlled for % fat mass (n=55). p<0.01. Waist circumference (WC); SED (sedentary behaviour); energy expenditure (EE).

• The absence of MVPA may be more important than the presence of sedentary behaviour for the accumulation of body fat.

• Higher adiposity was associated with markers of appetite dysregulation (Disinhibition and Binge Eating).

• After controlling for adiposity, physical activity and sedentary behaviour were not associated with appetite dysregulation.

• Further research will investigate the relationships amongst physical activity, sedentary behaviour and appetite control using a robust methodological platform over a 14 week period.

Conclusion

References


Acknowledgements

This research is supported by the EU grant agreement number 610440.