The anterolateral abdominal wall, rectus abdominis (RA), external oblique (EO), and internal oblique (IO), contributes to lumbo-pelvic-hip strength; and its role in injured populations such as low back pain has been well explored. However, it is important to establish the association between a body mass normalized measure of muscle size with overall physical activity in a healthy population due to their utility as a frequently used control group and for the potential of this measurement technique in aging, resistance training, and abdominal fat assessment.

**PURPOSE:** To determine relationships between muscle thickness (at rest and during contraction) of RA, EO, and IO and patient-reported outcome measures on physical activity and health.

**METHODS:** Eight active participants with no history of low back or lower extremity injury (23.1±5.4yrs, 171.1±11.3cm, 70.6±15.1kg, 4F) completed a single imaging session of RA, EO, and IO. Before imaging, participants completed the PROMIS Global Health, PROMIS Physical Function (PF), and International Physical Activity Questionnaire Short Form (IPAQ). Ultrasound images were collected at rest while supine, hook-lying and during contraction with participants instructed to perform an abdominal crunch for RA, and crunches toward either knee for EO and IO. Thickness measures were normalized to body mass (kg). Pearson’s r correlation coefficients were used to determine relationships.

**RESULTS:** Six of the 8 participants scored high on the IPAQ (≥3000 METmin/week) and the rest were moderate (≥600 METmin/week). The average hrs/day participants spent sitting was 4.6±2.3hrs. The PROMIS GH (37 3±4.7) and PROMIS PF (98 9±2.4) both confirmed overall health and activity levels. Right side EO at rest (r=.74, p=.04) and during contraction (r=.84, p<.01) were strongly related to hours spent sitting per day.

**CONCLUSIONS:** Normalized EO muscle thickness was found to increase, at rest and during contraction, as healthy, active individuals sat longer. Although this was the only significant correlation, this controversial finding may be explained due to the relative 17.4% decrease in EO activity on the right side, compared to the left. The connection between the abdominal wall and self-reported physical activity is important to distinguish, especially with a body mass normalization technique.

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**Table: Comparison of Kinematic Variables Between Groups**

<table>
<thead>
<tr>
<th></th>
<th>ASD (n=10)</th>
<th>Non-ASD (n=10)*</th>
<th>Between-Group Differences</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvis ROM</td>
<td>8.3±2.81</td>
<td>6.7±2.35</td>
<td>1.6</td>
<td>0.194</td>
</tr>
<tr>
<td>Hip flexion</td>
<td>45.7±4.69</td>
<td>45.9±11.03</td>
<td>0.2</td>
<td>0.965</td>
</tr>
<tr>
<td>Hip abduction</td>
<td>5.1±3.99</td>
<td>4.6±1.81</td>
<td>0.57</td>
<td>0.077</td>
</tr>
<tr>
<td>Hip internal rotation</td>
<td>6.6±6.16</td>
<td>8.3±3.6</td>
<td>1.7</td>
<td>0.321</td>
</tr>
<tr>
<td>Knee abduction</td>
<td>7.1±4.81</td>
<td>1.6±3.94</td>
<td>3.5</td>
<td>0.100</td>
</tr>
<tr>
<td>Knee flexion</td>
<td>50.1±8.77</td>
<td>49.9±4.75</td>
<td>0.2</td>
<td>0.888</td>
</tr>
<tr>
<td>Ankle dorsiflexion</td>
<td>64.4±2.98</td>
<td>52.0±16.52</td>
<td>1.4</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Abbreviations:** ASD=Autism Spectrum Disorder, ROM = range of motion

*Values are mean±SD degrees

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**B-72**

**Free Communication/Poster - Pitching, Throwing, and Hitting**

**Wednesday, May 27, 2020, 1:30 PM - 4:00 PM**

**Room: CC-Exhibit Hall**

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**1017 Board #143 May 27 1:30 PM - 3:00 PM**

**The Relationship Of The Kinematic Sequence And Shoulder Compression Forces During Fastpitch Softball**

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**Reported Relationships:** D. M. Scarborough: Salary; FIGUR8, Inc. Ownership Interest (stocks, stock options, or other ownership interest excluding diversified mutual funds).

Please specify in the field specific ownership interests, (i.e. own the company, own stocks, future stock options); future stock options.

257