BACKGROUND:

The reliable measurement of spasticity in children is critical to monitor the progress of children with cerebral palsy (CP). Recent studies of spasticity measurement have consistently utilized the Ashworth Scale (MAS) to quantify muscle tone. Bohannon and Smith (1987) which are actually true or different measuring scales that have become the standard assessment method for spasticity. Although the original scale has been modified twice, reliability studies have demonstrated varied results for the MAS. Recently, while executing another study using the MAS, the investigators created more detailed instructions on using the MAS to enhance reliability of measurements across multiple sites.

METHODS:

STUDY DESIGN/SETTING:

Seventeen children (mean age 10.9 years ±3.38) with hypertonia due to CP were recruited from the physical therapy clinic and assigned times (AM, Noon, or PM) on both days, approximately 24 hours apart. During the assessment, the raters were given the standard definitions provided by Bohannon and Smith (1987) for scoring their patients. Based on the investigators’ experience, the trained raters had more training and study with the MAS through their everyday clinical practice (highlighted in tan).

The reliable measurement of spasticity is critical to monitor the progress of children with cerebral palsy (CP). The tool used to measure spasticity is the Ashworth Scale (MAS). The MAS has been modified twice, and reliability studies have demonstrated varied results for the MAS. Recently, a new study was conducted to enhance the reliability of measurements across multiple sites.

GROUP A: TRAINED Raters:

For the purposes of this study, raters in Group A were trained using a newly developed specialized training method on performing MAS assessments. The raters in this group attended a formal class given by the investigators that had divided the available range of motion into quarters to better delineate the degree of spasticity. Following training and supervision, the raters were certified in the assessment technique using the MAS as done on patients’ digits diagnosed with CP (See Figure 3).

GROUP B: UNTRAINED Raters:

For the purposes of this study, raters in Group B were trained using a newly developed specialized training method on performing MAS assessments. The raters in this group attended a formal class given by the investigators. The trained raters were given the standard definitions provided by Bohannon and Smith (1987) for scoring their patients. Based on the investigators’ experience, the trained raters had more training and study with the MAS through their everyday clinical practice (highlighted in tan).

RESULTS:

Table 1: Intrarater reliability for the trained raters was 0.72 on Day 1 and 0.86 on Day 2. The inter-rater reliability for the untrained raters (0.37 on Day 1 and 0.71 on Day 2). (See Table 2 and Figure 4.)

For inter-rater reliability by joint, the trained group had greater weighted kappa values compared to the untrained group for each of the four joints. For the trained raters, the inter-rater reliability ranged from 0.62 to 0.86, for the untrained raters, inter-rater reliability ranged from 0.31 to 0.61. (See Table 3 and Figure 6.)

TABLE 1: Intrarater reliability for the trained raters was 0.72 on Day 1 and 0.86 on Day 2. The inter-rater reliability for the untrained raters (0.37 on Day 1 and 0.71 on Day 2). (See Table 2 and Figure 4.)

Table 2: Inter-rater reliability for all healthcare providers with specific experience in the examination of children with cerebral palsy using the MAS standard protocol (highlighted in blue) and three untrained raters performing assessments using routine clinical practice (highlighted in gray).

<table>
<thead>
<tr>
<th>Joints</th>
<th>Intrarater Rater 1</th>
<th>Intrarater Rater 2</th>
<th>Intrarater Rater 3</th>
<th>Inter-rater Rater 1</th>
<th>Inter-rater Rater 2</th>
<th>Inter-rater Rater 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trained</td>
<td>0.72</td>
<td>0.86</td>
<td></td>
<td>0.72</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Untrained</td>
<td>0.37</td>
<td>0.71</td>
<td></td>
<td>0.37</td>
<td>0.71</td>
<td></td>
</tr>
</tbody>
</table>

INTER-RATER RELIABILITY:

For inter-rater reliability by joint, the trained group had greater reliability compared to the untrained group. The trained raters had greater weighted kappa values compared to the untrained group for each of the four joints. For the trained raters, the inter-rater reliability ranged from 0.62 to 0.86, for the untrained raters, inter-rater reliability ranged from 0.31 to 0.61.

DISCUSSION:

Training was associated with significant improvement in intrarater reliability. Training increased the trained group’s demonstrated good agreement (Day 1: 0.72 vs. 0.86) compared to the untrained group’s widespread agreement (Day 1: 0.37 vs. 0.71). Although the trained group had greater inter-rater reliability for the untrained raters demonstrated good agreement (Day 1: 0.62 vs. 0.71) for each of the four joints. As expected, both trained and untrained raters had higher agreement for the elbow and ankle compared to the shoulder and wrist. The trained group had greater challenges with all four joints but had the greatest challenges with the ankle and knee followed by the wrist.

CONCLUSIONS:

Training was associated with significant improvement in intrarater reliability. Training increased the trained raters demonstrated good agreement. The trained raters had greater inter-rater reliability compared to the untrained raters. Training was associated with significant improvement in interrater reliability by joint. For inter-rater reliability by joint, for each of the four joints assessed, the trained group had greater reliability compared to the untrained group. The trained raters had inter-rater reliability for the shoulder and wrist similar to the untrained group while the trained raters had less agreement for the elbow and ankle. Although the trained group had the greatest challenges with all four joints but had the greatest challenges with the ankle and knee followed by the wrist.

REFERENCES:

- Yam & Leung (2006)
- [In Process]
- [In Process]