Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with development or everyday functioning. It is estimated to affect 7.2% of children (Visser, Blumberg, Danielson, Bitsko, & Kogan, 2013). ADHD increases the probability of learning problems, injuries, social problems, and other physical and mental conditions (Getahun et al., 2013). The potential effects of ADHD add even more importance to the recognition of symptoms and correct screening results for children with ADHD.

The American Academy of Child and Adolescent Psychiatry (2007) suggests that diagnosis of ADHD include interviews, reviews of school, medical, social, and family records, and other assessments. As this cannot be done for every child, schools need easy but accurate ways to screen for ADHD. Broad based questionnaires, completed by parents, are used as a solution to assess the child across multiple behavioral dimensions while also taking into account the child’s age. The project’s purpose was to analyze the sensitivity (accuracy of identifying all the children with ADHD) of two popular questionnaires to determine their usefulness as screening tools.

Methods


The BASC™-2, which is designed to look at a child’s personality and behavior, and the Conners 3™, which looks more specifically into behavior features of ADHD and comorbid disorders, were the broad based questionnaires analyzed. Each test calculates t-scores comparing the child’s score to those of other children his/her age for the different subscales of the test. In this study, only the t-scores referring to ADHD domains (Inattention and Hyperactivity/Impulsivity) were analyzed. The ADHD-IV, which is a symptom count based on symptoms listed by the American Psychiatric Association, was used to operationally define the diagnosis of ADHD.

For each test, cut-off scores based on common clinical practices were used to indicate the presence of ADHD. The BASC™-2 was analyzed with cut-off scores at ≥60 and ≥70 and the Conners 3™ was at ≥70. For the ADHD-IV, a symptom count of ≥6 represented ADHD diagnosis. The sensitivity and specificity of each scale was then calculated. The sensitivity is the accuracy of identifying the youth at risk for ADHD while the specificity is the accuracy of identifying children not at risk for ADHD.

Results

<table>
<thead>
<tr>
<th>Scale</th>
<th>Domain</th>
<th>Cut-off Score</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conners 3™ IA</td>
<td>IA</td>
<td>70</td>
<td>88.09</td>
<td>63.46</td>
</tr>
<tr>
<td>BASC™-2 IA</td>
<td>IA</td>
<td>60</td>
<td>88.09</td>
<td>47.11</td>
</tr>
<tr>
<td>Conners 3™ HI</td>
<td>HI</td>
<td>70</td>
<td>92.68</td>
<td>71.42</td>
</tr>
<tr>
<td>BASC™-2 HI</td>
<td>HI</td>
<td>60</td>
<td>82.92</td>
<td>63.26</td>
</tr>
<tr>
<td>BASC™-2</td>
<td>HI</td>
<td>70</td>
<td>70.73</td>
<td>93.87</td>
</tr>
</tbody>
</table>

Figure 1: The reference lines mark the cut off scores that were analyzed for each questionnaire. The sensitivity of each is the upper right quadrant divided by everything to the right of the line, and the specificity is the bottom left quadrant divided by everything to the left of the line. Graphs A and C have more points in the upper quadrants as compared to graphs B and D which results in higher sensitivity but lower specificity.

The project had a sample size of 188 children ages 6.1 to 18.8 years (mean: 10.4). According to the ADHD-IV, 50.53% of the sample was diagnosed with some form of ADHD: 28.72% as predominantly inattentive, 58.55% as predominantly hyperactive/impulsive, and 15.96% as combined inattentive and hyperactive/impulsive. The sample was clinically referred, as reflected by the mean t-scores of each scale in the ADHD domains being significantly higher than the expected norm of 50 (p < 0.01).

T-scores of the two measures were correlated in both the Inattention (IA) and Hyperactivity/Impulsivity (HI) domains (r = 0.732, r = 0.791), however, a paired sample t-test revealed that the mean t-scores from the two measures were significantly different (p < 0.01). According to a 2-proportion z-test, the sensitivity of the Conners 3™ was significantly higher (p < 0.01) than the BASC™-2 for both domains at the cut off score of ≥70. When the Conners 3™ at cut off score of ≥70 was compared to the BASC™-2 at ≥60, there was no significant difference in sensitivity for both the IA and HI domains. However, the specificity of the BASC™-2 was significantly higher (p < 0.01) than the Conners 3™ in both domains at the cut off score of ≥70.

Conclusion

The purpose of this project was to determine the sensitivity of two behavioral checklists in an effort to determine their usefulness as screening tools for youth at risk for ADHD. Based on the results, the Conners 3™ would be the better tool to identify children at risk for ADHD and thus would be the better questionnaire to use in school and clinical settings in order to determine which children should be sent for further evaluation. Knowing the sensitivity of the Conners 3™ as compared to the BASC™-2 will help counselors and clinicians to be more accurate in the screening process and will lead to more children receiving the diagnosis and the following treatment that they need.

References


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