COGMED

CLINICAL EVALUATION SERIES

Cogmed Working Memory Training
Pearson
Clinical Assessment

Part I

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COGMED CLINICAL EVALUATION SERIES: PART I

INTRODUCTION

Cogmed Working Memory Training is implemented and supported by a network of practitioners worldwide. Beyond the confines of the research lab, where Cogmed has its foundations, Cogmed Coaches bring working memory training into the real world, as they focus on the challenges faced by the individual. In the United States alone, over 300 coaches have backed more than 10,000 End-Users as they have embarked on their training experience. Globally, practitioners in 30 countries have contributed to the growth of Cogmed, now the leader in evidence-based cognitive training.

As a supplement to the Cogmed Claims and Evidence document, the Clinical Evaluation Series is intended to add a new level of support for the efficacy of Cogmed Working Memory Training. This document, Clinical Evaluation Series Part I, presents a summary of the de-identified clinical findings collected by Cogmed Coaches in three practices, one in each Singapore, the Netherlands, and Canada. In particular, this text focuses on parent ratings of inattentive symptoms in children and self report of inattention, ADHD symptoms, and cognitive failures in adults. Interestingly, the results from each of the practices are quite consistent: 80% of adults and children that train with Cogmed experience improvement at post-test and there is a 30% improvement in inattentive symptoms.

UNDERSTANDING THE STATISTICS FROM COGMED

In communicating about the results from Cogmed Clinical Evaluations, the improvements seen after training can be described in terms of the entire group of Cogmed End-Users, regardless if they improved or did not improve after training, or in terms of just those participants who improved after training. Percent (%) improvements are based on the change in the group of Cogmed End-Users on the outcome measure between baseline and post-test. This document reports:

✓ The percent of the total sample that improved (ie., experienced gains) after training.

✓ The percent improvement in symptoms for only the group that experienced gains after training.

✓ The percent improvement in symptoms for total sample.
CLINICAL EVALUATION

CHILDREN

Clinical data from 769 children collected at three distinct practices in Singapore, the Netherlands, and Canada revealed that on average, Cogmed users improved their inattentive symptoms, as rated on the DSM-IV Parent Rating Scale, by 30% from baseline to post-test. On average, 82% of the children experienced gains and when parsed out from the total sample, this group improved their inattentive symptoms on average by 36% from baseline to post-test. See Figure 3 for the data.

Singapore
- 78% of the 222 children who completed Cogmed improved on ratings inattentive symptoms.
- Children who improved after Cogmed showed a 38% reduction in inattentive symptoms.
- Considering the total sample of 222 children, the average improvement in inattentive symptoms was 31%.

Netherlands
- 88% of the 500 children who completed Cogmed improved on ratings inattentive symptoms.
- Children who improved after Cogmed showed a 38% reduction in inattentive symptoms.
- Considering the total sample of 500 children, the average improvement in inattentive symptoms was 33%.

Canada
- 79% of the 47 children who completed Cogmed improved on ratings inattentive symptoms.
- Children who improved after Cogmed showed a 32% reduction in inattentive symptoms.
- Considering the total sample of 47 children, the average improvement in inattentive symptoms was 26%.

Figure 1. Mean baseline and post-test inattention scores for children from three Cogmed practices on DSM-IV Parent Rating Scale.
Clinical data from 120 adults collected at two distinct practices in Singapore and the Netherlands revealed that on average, Cogmed users improved their inattentive symptoms, as reported on the DSM-IV Adult Rating Scale, by 28% from baseline to post-test. On average, 80% of the adults from Singapore and the Netherlands experienced gains and when parsed out from the total sample population, this group improved their inattentive symptoms on average by 36% from baseline to post-test. See Figure 3 for the data.

**Singapore**
- For the 8 adults who completed Cogmed, 75% improved on a measure of inattentive symptoms.
- Adults who improved after Cogmed showed a 42% decrease in inattentive symptoms.
- Considering the total sample of 8 adults, the decrease in inattentive symptoms was 30%.

**Netherlands**
- For the 112 adults who completed Cogmed, 86% improved on a measure of inattentive symptoms.
- Adults who improved after Cogmed showed a 29% decrease in inattentive symptoms.
- Considering the total sample of 112 adults, the decrease in inattentive symptoms was 25%.

Figure 2. Mean baseline and post-test inattention scores for adults from three Cogmed practices on DSM-IV Self Rating Scale.
Canada

It should be noted that the clinical data from Canada includes a combined inattention and hyperactivity rating for ADHD and should thus be considered separately from measures solely of inattention. Self-report of cognitive failures in daily life were also collected by the Canadian practice using the Cognitive Failures Questionnaire (CFQ). Below, find a summary of the statistics. For data, see Figure 3.

ADHD

- 83% of adults improved on a measure of combined inattentive and hyperactive symptoms.

- Adults who improved after Cogmed showed a 25% decrease in combined inattentive and hyperactive symptoms.

- Considering the total sample of adults (N = 29), the decrease in combined inattentive and hyperactive symptoms was 19%.

Cognitive Failures

- 76% of adults improved on the CFQ, a self report measure of cognitive failures in daily life.

- Adults who improved after Cogmed showed a 27% decrease in self report of cognitive failures.

- Considering the total sample of adults (N = 29), the decrease in cognitive failures was 18%.

Although the effect of Cogmed on symptoms in the Canadian practice was smaller than typically observed, it can be posited that poorer scores on the hyperactivity component of the scale may have attenuated the combined score. Consistent with Cogmed research and clinical experience, it is likely that Cogmed has less impact on hyperactivity symptoms than those related to attention. However, it is worth mentioning that over 83% of all participants improved on the measure of ADHD with a 19% reduction in symptoms.

Results from the Canadian practice on the adult report of cognitive failures are also encouraging, with a decrease on the CFQ of 18% for the entire sample. Three Cogmed research studies have used the CFQ with a total of 82 participants and have reported an average 18% improvement after training (Westerberg et al., 2007, Lundqvist et al., 2010, Johansson & Tornmalm, 2011).
Figure 3. Rating scale data for children and adults from three clinical practices using Cogmed in Singapore, the Netherlands, and Canada.

<table>
<thead>
<tr>
<th></th>
<th>N total</th>
<th>Mean (SD) T1</th>
<th>Mean (SD) T2</th>
<th>SC</th>
<th>%1</th>
<th>N improved</th>
<th>% 2</th>
<th>% 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore (Inattention)</td>
<td>222</td>
<td>17.01 (6.550)</td>
<td>11.77 (6.240)</td>
<td>0.80</td>
<td>30.81</td>
<td>172</td>
<td>77.48</td>
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<td>Netherlands (Inattention)</td>
<td>500</td>
<td>17.63 (5.010)</td>
<td>11.86 (4.920)</td>
<td>1.15</td>
<td>32.73</td>
<td>438</td>
<td>87.60</td>
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<td>Canada (Inattention)</td>
<td>47</td>
<td>17.70 (6.105)</td>
<td>13.13 (5.918)</td>
<td>0.75</td>
<td>25.82</td>
<td>37</td>
<td>78.72</td>
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<td>Child Summary</td>
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<td>0.90</td>
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<td>29.78</td>
<td>647</td>
<td>81.27</td>
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<td>Singapore (Inattention)</td>
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<td>22.33 (6.205)</td>
<td>15.62 (8.380)</td>
<td>1.08</td>
<td>30.05</td>
<td>6</td>
<td>75.00</td>
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<td>Netherlands (Inattention)</td>
<td>112</td>
<td>23.96 (5.025)</td>
<td>18.05 (5.143)</td>
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<td>24.67</td>
<td>96</td>
<td>85.71</td>
<td>28.93</td>
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<td>Adult Summary (Inattention)</td>
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<td>1.13</td>
<td></td>
<td>27.36</td>
<td>102</td>
<td>80.36</td>
<td>35.44</td>
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<td>Canada (ADHD)</td>
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<td>28.19 (10.753)</td>
<td>22.77 (10.088)</td>
<td>0.50</td>
<td>19.23</td>
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<td>82.76</td>
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<tr>
<td>Canada (CFQ)</td>
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<td>54.53 (13.903)</td>
<td>44.64 (14.491)</td>
<td>0.71</td>
<td>18.14</td>
<td>22</td>
<td>75.86</td>
<td>27.29</td>
</tr>
</tbody>
</table>

N<sub>total</sub> = total number of participants in the sample  
SC = standardized change, (mean T2 - mean T1 / SD T1)  
% 1 = average percent improvement for N<sub>total</sub> on rating scale from baseline to post-test  
N improved = number of participants in the sample that significantly improved on rating scale from baseline to post-test  
% 2 = percent of N<sub>total</sub> that significantly improved on rating scale from baseline to post-test, ((N improved / N total)*100)  
% 3 = average percent improvement for N improved on rating scale from baseline to post-test
CONCLUSION

Consistent with the message put forth by Cogmed, as well as the findings from academic research, 80% of Cogmed End-Users improve after training. Further, End-Users improve by 30% on measures of inattentive symptoms. Clinical Evaluations such as those included in this, Part I of the Clinical Evaluations Series, add yet another level of evidence for the claims made by Cogmed. Not only does research support the efficacy of Cogmed at the biochemical, neuro-imaging, neuropsychological, and behavioral levels but, so too does the clinical data which reflects the real world implementation of the Cogmed solution. Always looking to the future, Cogmed thus encourages clinicians using Cogmed in their practices to collect detailed data that will add to the growing body of support for Cogmed and provide them greater information for how the effects of Cogmed manifest in the real world. The statistics reported from the practices in this Clinical Evaluation can be used as a reference point for how many End-Users are expected to improve and by how much their symptoms are expected to decrease.