A Review of the Comorbidity of ADHD and Dyslexia

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Background

Academic success and other life outcomes are influenced by a person's reading ability. Reading is a complex multicomponent skill that must be taught, yet many children struggle to learn to read. It is estimated that 5-17.5% of the population struggle to learn to read due to dyslexia, a neurobiological condition that involves difficulties with accurate and/or fluent word recognition, poor spelling, and a slow response to instruction (Shaywitz & Shaywitz, 2004). Past research suggests dyslexia occurs along a continuum such that a given individual may exhibit a variety of both risk and protective factors that impact the extent of their reading difficulties (Pennington et al., 2012). Factors within a person or within their environment that complicate the learning process may exacerbate reading difficulties. One of these factors involves a person's attention abilities. It is estimated that 5% of the population exhibit difficulties associated with attention-deficit/hyperactivity disorder, ADHD (Bouda et al., 2012). Moreover, about 20-40% of children with ADHD or dyslexia experience symptoms of both disorders. Yet, there are questions about diagnosis, prognosis, and treatment for individuals who exhibit symptoms of both disorders. For the present project, the empirical literature was reviewed to gain insight into what is currently known about the co-occurrence of dyslexia and ADHD. Differences emerged in the diagnostic or identification procedures associated with each condition. Yet this literature also suggests that individuals with both dyslexia and ADHD often display similar deficits in academic and executive functioning as well as social impairments.

Goal of the Project

- Provide an understanding of multiple factors associated with each condition to inform diagnosis, prognosis, and treatment decisions to support a person's functioning across multiple areas of their lives.

ADHD Definition

- Definition: persistent pattern of inattention and/or hyperactivity - impulsivity that interferes with functioning or development. Symptoms must have been present for at least 6 months and occur in 2 or more settings (DSM-5; APA, 2013).
- Diagnosed using parent/teacher reports and behavior assessments.
- Subtype labels can be used to indicate which symptom type is predominant, or if both are present.

ADHD Prognosis

- Symptoms can be seen as early as preschool age but sometimes are not diagnosed until the child is in grade school (CDC, 2020).
- About 5% Of children are diagnosed with ADHD.
- Deficits in executive function are prominent (Martinussen, 2015).
- Treatments includes behavioral therapy and/or medication (CDC, 2020).

Dyslexia Definition

- Definition: specific learning disability that is neurobiological in origin. It is characterized by difficulties in accurate and/or fluent word recognition, poor spelling and decoding abilities. It typically results from a phonological deficit and may lead to secondary consequences of reading comprehension problems (Lyon et al., 2003; adopted by IDA and TN DOE).
- Diagnosed using tests of achievement and documenting response to appropriate instruction.

Dyslexia Prognosis

- About 5-17.5% of children are diagnosed with dyslexia (Shaywitz & Shaywitz, 2004).
- Treatments focus on providing direct, explicit, and systematic instruction in reading and literacy skills (TN DOE, 2016).

Table 1. Example Symptoms of ADHD

<table>
<thead>
<tr>
<th>Inattention</th>
<th>Hyperactivity - impulsivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble holding attention on tasks</td>
<td>Fidgets, taps hands or feet, or squirms</td>
</tr>
<tr>
<td>Distracted when being spoken to</td>
<td>Leaves seat often</td>
</tr>
<tr>
<td>Fails to complete tasks or assignments</td>
<td>Talks excessively and blurts out answers</td>
</tr>
<tr>
<td>Difficulty organizing tasks and/or activities</td>
<td>Difficulties with waiting their turn</td>
</tr>
<tr>
<td>Is often forgetful in activities</td>
<td>Inturrupts or intrudes on others often</td>
</tr>
</tbody>
</table>

Table 2. Skill Areas Associated with Dyslexia

<table>
<thead>
<tr>
<th>Skill</th>
<th>Definition (Ability to …)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Reading Accuracy</td>
<td>read real words</td>
</tr>
<tr>
<td>Phonological Decoding Accuracy</td>
<td>use knowledge of the correspondences between written letters and sounds to read</td>
</tr>
<tr>
<td>Reading Fluency</td>
<td>read words quickly, accurately, and with appropriate prosody</td>
</tr>
<tr>
<td>Encoding Skills</td>
<td>spell written words</td>
</tr>
<tr>
<td>Phonemic Awareness</td>
<td>distinguish, segment, blend, and manipulate sounds within words</td>
</tr>
<tr>
<td>Rapid Naming</td>
<td>efficiently retrieve phonological information from long-term memory</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>gain meaning from text</td>
</tr>
</tbody>
</table>

Table 3. Example Areas of Executive Functioning

<table>
<thead>
<tr>
<th>Skill</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Working Memory</td>
<td>Temporary preservation of verbal information</td>
</tr>
<tr>
<td>Inhibition</td>
<td>Ability to control automatic responses</td>
</tr>
<tr>
<td>Processing Speed</td>
<td>Time it takes an individual to complete a mental task</td>
</tr>
</tbody>
</table>

Co-Occurrence of ADHD & Dyslexia

- 20 to 40% of children with ADHD and dyslexia experience symptoms of both (Willcutt & Pennington, 2000).
- A combination of factors are more likely to be a cause of the co-occurrence of ADHD and dyslexia.
- Children with both ADHD and dyslexia exhibit a larger number of symptoms of each condition, more social difficulties, and greater impairment in academic functioning.
- Inattention problems are one risk factor that suggest a greater potential for problems with later reading achievement.
- Children identified with comorbid ADHD and dyslexia show slower processing speed compared to children with only ADHD or dyslexia.

Theories about Underlying Causal Factors

- Genetic and environmental factors have been implicated for both ADHD and dyslexia (Catt et al., 2017).
- Pennington et al (2012) proposed a multiple deficit model that included potential deficits in phoneme awareness, language skill, processing speed, and naming speed as prominent causes of dyslexia.
- Catts et al (2017) also agreed that a phonological deficit along with issues with rapid naming and oral language could cause dyslexia.
- Pennington (2006) discussed how single deficit models are not sufficient to explain either dyslexia or ADHD. Further, there appear to be unique and shared deficits present across both conditions.

Shared Difficulties in Executive Functions

- Individuals with either ADHD, or dyslexia, or both conditions sometimes exhibit difficulties with some types of executive function.

Discussion

- Research exploring the comorbidity of dyslexia and ADHD highlights some of the difficulties shared between these conditions.
- There is a limited amount of information and research that focuses on the intervention and treatment of both ADHD and dyslexia.
- Future directions of this research can address questions such as how do professionals establish and administer an effective treatment and/or intervention program for children with ADHD and dyslexia.

References


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