

Acquired Dyslexia and Developmental Dyslexia How to Interfere Dyslexia in School Age Students

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ABSTRACT

In recent years, increasing children are encountered reading problems with undetected reasons. Teachers always attributed these to capacity of students, parents even don't understand how the impairment influenced their children. Relevant educators still do not have sufficiently systematic and profound understanding of the causes and interventions of children's dyslexia. This paper discusses the factors which causes reading difficulties and other learning disorder, and interference in teaching. Finally, through a review of intervention studies on learned dyslexia and developmental dyslexia, this article finds that children with special educational needs can be cultivated from both physical and cognitive aspects.

Keywords: *acquired dyslexia, developmental dyslexia, disorder, intervention*

1. INTRODUCTION

According to decades of study on dyslexia, dyslexia was not only described as simple reading difficulties, but a comorbidity of cognitive processing problems, difficulties with motor skills, and visual or hearing impairment. Some dyslexic children may have problems in short-term memory, organization, and spoken language. Since many children with special educational needs (SENs) present reading deficits such as slow reading speed and poor ability in text comprehension, they always have poor performance in concentration on reading, listening to similar sound words and following instructions of teachers. Nicolson et al. [1] proposed that cerebellar dysfunction was the main factor to influence the dyslexia, because the cerebellar controls children's motor skills related to high cognition. Recently, neurologist have distinguished two kinds of dyslexia in research: acquired dyslexia and developmental dyslexia. The former was caused by brain damage that inhibited decoding phonological function, and latter had difficulty accessing the phonological representations of word, which generally transmitted from their parents. Acquired dyslexia hindered the activation of phonological representations and word image representations with particular damage, in contrast, children with developmental dyslexia faced a problem in processing the phonological representations of words. In particular, they have difficulty recognizing

words that have irregular pronouncing patterns (e.g., iron) and letter or character sequences that are not words (e.g., Sloke) but can be pronounced. Both cause individuals with impaired reading skills, but the underlying causes of the impairment are quite different. Since dyslexia severely constrain the children's academic performance in school, many educators and neurologists attempt to find out efficient therapies to cure dyslexia.

1.1. Background of the Study

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1.2. Problem Statement/Impairment of learning

Dyslexia is the most pervasive form of learning impairment and perhaps the best known. It affects a large number of children and adults in many countries and

continents [2]. Literature stated that dyslexic students generally have difficulty in organizing spoken and written language [3]. It means that the affected children are unable to read the words properly and it is hard to learn phoneme-grapheme associations [4]. Researches also show that children with dyslexia are usually connected to having psychological problems, including low self-esteem, depression, anxiety [5]. Therefore, some training and intervention programs are proposed to help dyslexic children in learning, of which one is called the Dore treatment program. It is a behavioral training program proposed by Nicolson and Fawcett and is said to be able to improve dyslexic students' one-minute reading, bead threading and semantic fluency [6]. Because of brain damages, dyslexia is a lifelong problem, that there is no effective way to correct. Many prevalent interventions today to deal with dyslexia students are to improve or revolutionize the teaching methods and strategies that teachers adopted, such as putting more emphasis on phonology and phonological awareness, phoneme-grapheme association. They said that instruction should be multi-sensory, including visual information, auditory information, motor kinaesthetic information, and tactile information should be used when teaching and learning [7]. Intervention should improve [8] oral language activities, reading comprehension, and vocabulary [7].

However, the majority of the interventions and strategies used focus more on teaching students to learn new skills and techniques of remembering new knowledge. Little or even now research exists mentioned about methods that encourage and assist dyslexia students to be a life-long learner. Therefore, the purpose of this paper is to study the limitation of the present and existing interference towards dyslexia, and hopefully to provide an intervention program that can benefit dyslexic students in the long-term. As a studies, dyslexia should be the most precious assessment of learning difficulties in school age children. Disorder in the development of reading skill is the most remarkable performance. Considering the influence and impact of dyslexia to students' learning, relevant intervention is proposed and adopted.

2. JUSTIFICATION OF THE STUDY

Dyslexia is a particular learning disability that originates from neurone's impairment. Many research findings presented the deficit in reading skill, especially in distinguishing the phonemes that construct language. However, the treatment of dyslexia has been developed from many aspects, such as neuroscience, behavioural training, emotional controlling and genetic analysis. The term dyslexia refers to two different kinds of reading difficulty, acquired dyslexia and developmental dyslexia. Acquired dyslexia refers to reading difficulties in a person who lost the normal ability of reading that he/she has lost after some brain damage; Developmental dyslexia concerns the reading process of decoding in children's

developmental stage. Therefore, different treatments are developed to handle these two types of dyslexia. In the following section, mainly two types of dyslexia will be discussed separately.

2.1. Acquired dyslexia

Acquired dyslexia is a reading difficulty that occurs after brain injury in someone who was previously able to read normally [9]. The involved injury usually involves the left hemisphere of the brain, which is where the language center is located [9].

Reading ability based on the processing of encoding the symbols or sounds which represented abstract or objective concepts such as units: letters, words, graphemes, and numbers correlate with comprehension. Semantic knowledge will then be developed through the relation between the features of concepts and representational units [10]. However, brain damage directly resulted with trauma of visual, phonological or semantic function, and then acquired dyslexia will appeared as the mainly syndrome.

If the occipital Lobe injured, it will harm the area of supporting visual function, caused inability to recognize letter. If the temporoparietal junction injured, impairment of phonological processing mostly will be incurred, as well as semantic dysfunction.

2.1.1. Intervention of acquired dyslexia

As seen above, acquired dyslexia can be further divided into three parts: peripheral impairment which caused disorder of decoding words in visual function, the central dyslexia associating with language organization, computational disorder. Before any intervention, the primary concern is to consider the ultimate causes of their reading deficits and tackle the underlying deficits [11]. If damage is serious, treatment may focus on more reliance on other intact abilities to compensate [11].

Pure alexia can't recognize the words, in their minds the letters are incomplete the patient who suffers from alexia will distinguish every letters then recognize the words. Pure alexia can't be remediated only through speech therapies, but kinaesthetic and neurology. [12]. Phonological dyslexics performance better in most common words, conversely difficulty in spelling and reading complex words [13]. De Partz [14] constructed correlation of grapheme -phonemes to treat the phonological dyslexia, emphasizing the single sound corresponding to a grapheme. Reducing the multiple syllables in reading processing, and using link syllables to cue the phonemes of the target grapheme. Rehearsal of same words with pictures illustration to children with Phonological dyslexias could help the semantic processing by using the whole word method used in teaching children to read, they could be systematically

taught the most frequent irregular words [15]. For phonological dyslexics, they can either be treated by reteaching letter-to-sound rules or increase the efficiency of the lexical route by teaching them to recognize common function words and affixes as whole morphemes [15].

2.1.2. Visual Attention Training

According to a study done by Scaltritti et al. [16], lower-level variables on a webpage, such as font size, page size and line spacing, support the importance of crowding phenomena and visual attention in shaping the reading behaviour. However, it does not mean that visuo-typographic variables may fully compensate for the difficulties faced by readers with dyslexia [16]. This study tells us that enhancing the visual attention training may improve dyslexic children's reading skill. Students with dyslexia have challenges on concentration, they have troubles in reading, writing and distinguishing characters or letter. Visual attention helps students focus on pictures not words and present a story or an operation. For instance, students who can't recognize words, understand words through using picture to replace the them. Schulte Grid also train the eye tracking through 5*5 grids, from 1-25 numbers or letters, every grid with a number or letter, students will find the number or letter in order as quickly as they can. However, Schulte Grid has no improvement in comprehending words, but focusing. Another strategy using different color to highlight the important words, help students concentrate on emphasised the information.

2.2. developmental dyslexia

2.2.1. Dyslexia Susceptibility Loci

Developmental dyslexia is different from acquired dyslexia in that this type reading difficulty is not developed because of injury and incident. Rather, it has already existed when a child was small. This arouses the interest of a lot of researchers whether developmental dyslexia is related to their DNA or genes. Therefore, multiple researches have been carried out to find out the relationship between genes and dyslexia and proposed several genes as susceptibility candidate related to dyslexia [17]. These include, KIAA 0319, DYX1C1 on chromosome 15, DCDC2 on chromosome 6, and ROBO1 chromosome 3. MRPL19 and C2ORF3 on chromosome 2 were also suggested to be related to developmental dyslexia [18].

Among all these, KIAA0319 gene is a strong candidate, being supported by evidence in both association and functional studies. KIAA0319 is located on chromosome 6p22.2–22.3. Its association with dyslexia was first proposed by Kaplan et al.,⁷ who found a micro-satellite marker residing in KIAA0319 according to linkage studies. Recently, its importance and significance are further confirmed by Lin et al. [19] in

their study. They selected 4251 Uyghur primary school students aged 8–12 years by cluster sampling in Kashgar and Aksu, Xinjiang, China. Their study shows and confirms that the associations of rs3756821 and rs6935076 with dyslexia remained significant and their sample size of 391 had adequate power to detect the true association of variants in KIAA0319 with dyslexia [19].

3. INTERFÉRENCE IN ACROSS-SENSORY

3.1. Auditory working memory training

Besides visual attention training improving students cognitive processing, auditory stimuli could be proved as another efficient method to assist students with dyslexia in phonological processing. The research in 2017 [20] demonstrated students with dyslexia also have some difficulties in auditory processing [21]. Action video game—"Rayman Raving Rabbids" can benefit the children through the enhancement of across sensory attention shifting training, mainly visual to auditory attention. Auditory training focuses on phonological working memory, and improve the decoding of phonemes thereby increasing the speed of reading. However, English reading involved complex graphemes and phonemes, auditory training plays a role in identifying pseudowords.

3.2. Medical Treatments

Pyritinol Hydrochloride is frequently used as a psychoenergizer by psychiatrists and pediatricians on patients suffering from speech disorders, underachievement, social and emotional disorder, and developmental retardation. In a study done by Wälti et al. [22], they tested the impact of Pyritinol Hydrochloride on cognitive functions of children with learning disabilities. The study showed that it does not significantly improve that average performance in 22 cognitive parameters in comparison with the placebo group. However, there was a significantly higher variance in the pyritinol group in some parameters.

4. CONCLUSION

One of the learning disabilities in school-aged children is the reading disorder that is also known as dyslexia. Although many researches have done in investigating dyslexia, most of the dyslexia teaching and learning methods nowadays focus more on developmental dyslexia instead of acquired dyslexia. Moreover, the majority of the researches are carried out overseas and there are limited dyslexia researches in the Chinese context. Therefore, in this study, more emphasis is placed on dyslexic intervention that can benefit children in the long-term.

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