Modification and Standardization of Egyptian dyslexia screening test for children

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

وَاصْبِرْ لِحُكْمِ رَبِّكَ فَإِنَّكَ بِأَعْيُنِنَا ۖ
وَسَبِّحْ بِحَمْدِ رَبِّكَ حِينَ تَقُومُ

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List of Abbreviations

ADAT	Arabic Dyslexia Assessment Test
ADHD	Attention deficit hyperactivity disorder
AFT	Auditory Fusion Test
ARQ	At Risk Quotient
CAPD	Central auditory processing disorder
COPS	Cognitive profiling system
DCD	Developmental coordination disorder
DD	Developmental Dyslexia
DDT	Dichotic Digit Test
DDT	Dyslexia Determination Test
DESD	Decoding Encoding Screener for Dyslexia
DEST	Dyslexia early Screening Test
DSM-5	The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
DST	Dyslexia Screening Test
EEG	Electroencephalography
IQ	Intelligence Quotient
LASS	Lucid Assessment System for Schools
LD	Learning Disabilities
LORETA	Low Resolution Electromagnetic Tomography
LPF	Low Pass Filtered Speech Test
Modified -PLS4	Preschool Language Scale, Fourth Edition
PCs	Percentiles
RAN	Rapid Automatized Naming

List of Abbreviations (Cont.)

SLI	Specific Language Impairment
SOP	Speed of Processing
SPIN	Speech Intelligibility in Noise Test
SPSS	Statistical Package for Social Science
SSD	Speech Sound Disorder
STM	Short Term Memory

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Introduction

Failure to become literate as expected at school can have serious outcomes on the individual's development and employment prospects. Despite normal cognitive abilities, language, students with reading failures experience reading failure ***(Ferrer et al., 2010).***

Dyslexia which is the commonest among learning disabilities, impairs a person's ability to read, and manifest itself by difficulty with rapid naming, auditory short-term memory, phonological awareness, phonological decoding and orthographic coding ***(Schulte-Körne et al., 2006).***

Developmental dyslexia is attributed to neurological factors that influence the individual's ability to read, write, and spell written language and it is separate and distinct from reading difficulties resulting from other causes, such as a non-neurological deficiency with vision or hearing, or from poor or inadequate reading instruction ***(Czepita and Lodygowska, 2006).***

Some of the conditions that may be contributory or overlapping factors and can lead to difficulties in reading include: Specific language impairment (SLI), Attention deficit hyperactivity disorder (ADHD) , Auditory processing disorder (CAPD) ***(Moore, 2007)*** and Irlen Syndrome - a term used to describe sensitivity to certain wavelengths of light which interfere

with visual processing later on ***(Kruk et al., 2008).***A child can be screened to be at risk of dyslexia even before he/she learns to read ***(Reynolds et al., 2003).***

No one single test score is pathognomonic for dyslexia. Diagnosis includes; family history, teacher/classroom observation, and tests of language (particularly phonology), reading, spelling, and intellectual ability. This represents a core assessment for the diagnosis of dyslexia in children. Additional tests of mathematics, attention, memory, and general language skills may be administrated as part of a more comprehensive evaluation of linguistic and cognitive function ***(Lyon et al., 2005).***

There are many tests applied on dyslexic children allover the world. Dyslexia Screening Test (DST) is one of the most widely used tests ***(Fawcett and Nicolson, 1996).*** Being a foreign test and heavily loaded culturally and linguistically it is not proposed to suit our own environment.

Aim of the work

The aim of this work was to modify the "Arabic Dyslexia Assessment Test" and standardization of the "Modified Arabic Dyslexia screening test" for screening of dyslexia in Egyptian children of age ranging from 6.6 to 11.5 years old, which may be beneficial for further management of such children.

REVIEW OF LITERATURE

Learning is the process of gathering cognitive, emotional and environmental influences and experiences changing one's knowledge, skills, values and world views ***(Illeris, 2000).*** Literacy is defined as competence in reading and writing with full recognition that such competence ordinarily rests upon an extensive experience base in the use of spoken language ***(Harris and Hodges, 2005).***

Reading development:

According to ***Stanovich (1980)*** reading fluency which is defined as the ability to read a text accurately and quickly, has 3 primary components (a) accuracy in decoding, (b) automaticity in word recognition and (c) the appropriate use of prosodic features such as stress on some words than others.

Frith (1985) stated that the development of reading can be divided into three phases identified with three strategies; *logographic* (instant recognition of familiar words), *alphabetic* (knowledge and use of associations between graphemes and phonemes) and *orthographic* (instant analysis of words into orthographic units without phonological conversion).

Ehri (1995) correlated phases of reading acquisition to school ages. The logographic phase is pre-school. Partial alphabetic reading begins normally at the start of schooling, but may be developed earlier. Full alphabetic reading happens in the