Dyslexia and its Relationship to Reading Comprehension and Oral Comprehension among Primary School Students

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Abstract: This study aims to identify the relationship between dyslexia, reading comprehension and oral comprehension, as both works interactively in the reading process. The sample was intentionally selected from fifth year primary school students in El Oued city, based on a diagnostic group whose size was estimated at 100 students. Besides, the Raven intelligence test, word reading test, reading comprehension test and oral comprehension test were applied to all sample individuals to detect potential differences in the results of these tests between the groups of typical readers and dyslexic readers. To achieve this, the descriptive method was used in its correlational and comparative approaches. The data was statistically processed employing the "t" test for significance of differences and calculating the Pearson correlation coefficient between the scores of the tests applied to the sample, depending on the SPSS statistical program.

Keywords: dyslexia; reading comprehension; oral comprehension; primary school students;

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Introduction :

Special education in general and learning disabilities in particular are contemporary topics in the Arab world that have not received sufficient research attention.

Although cases of learning disabilities intensify in primary school, which is one of the most crucial educational stages in a student's life where they acquire basic reading skills - it serves as the foundation for acquiring experiences and skills in understanding different other forms of knowledge. Therefore, the significance of studies in this field to explain reading difficulties, as it is the cause of many other academic problems. Reading is a fundamental subject that builds the comprehension of all subsequent learning inputs, whether receptive like oral language and reading comprehension, or productive like speaking and writing.

This study aims to identify the relationship between reading comprehension, oral comprehension and dyslexia. The processes of recognition and understanding are integrated - initially students focus on word recognition and oral comprehension, then on reading comprehension and text meanings in later stages. Furthermore, this research attempts to determine reading comprehension, oral comprehension and their relationship to dyslexia, as both processes are complementary. The student focuses on word recognition and oral comprehension in early learning stages, and on reading comprehension and text meanings in later stages.

Problem statement:

Reading skills are regarded as the most significant abilities the educational system strives to teach in primary school, as it is the first and primary subject students start their learning journey with, relying on it to acquire knowledge, develop themselves and solve problems. Furthermore, a student cannot progress in any academic subject without mastering reading skills, which many thinkers consider a cognitive process that involves interpreting received symbols and transforming them into sounds through representation, recognition and understanding, then connecting them to personal experiences and meanings.

According to some research and studies, reading requires two processes - the first is interpreting written symbols into meanings, which is the recognition process. The second is comprehension, the ability to extract meaning. Any disturbance in these processes either results in dyslexia represented by a deficiency in reading correctly at the level mastered by peers of the same age and educational stage (Hamza, 2008, p. 44), or a disturbance in the reader's understanding, interpretation and modification of the read material to match their cognitive background. Inability to keep pace with typically developing peers in acquiring academic skills at school prevents them from fulfilling an academic achievement level that matches their intellectual capabilities and good IQ.

Despite reading's significance in primary education, studies confirm a large number of students suffer from dyslexia estimated at approximately 61% of public school students, representing the most prevalent type of learning difficulty at around 80%.

These students face problems that impact various aspects included in school education, leading to a decline in their performance that may result in discontinuation of their education. Studies have shown a correlation between basic and auxiliary reading

processes like memory, attention, intelligence in addition to the mechanism of the reading activity and development of its skills such as word recognition and reading comprehension. However, they have not explicitly clarified the relationship of this disorder with understanding in its two forms: oral and reading. Both involve the process of receiving ideas from others, whether speakers or writers. Listening provides the child with vocabulary, words and sentence structures they utilize, forming the basis for the reading comprehension process.

Current theoretical models suggest that the individuals possess an "internal" stock of vocabulary where words are stored, allowing comprehension of oral or written language. Word recognition in reading involves linking their written representations to the appropriate units in the internal vocabulary stock.

From the above, the problem statement addressed by the present study emerges concerning the relationship between dyslexia, reading comprehension and oral comprehension, attempting to answer the following questions:

- Is there a statistically significant difference between dyslexic and typical students in reading comprehension?
- Is there a statistically significant difference between dyslexic and typical students in oral comprehension?
- Is there a statistically significant correlational relationship between the total reading score and reading comprehension scores for both the typical reading group and dyslexic group?

Study Hypotheses:

Based on the problem statement of the study and the questions raised, the study hypotheses were formulated as follows:

- There is a statistically significant difference between dyslexic and typical students in reading comprehension.
- There is a statistically significant difference between dyslexic and typical students in oral comprehension.
- There is a statistically significant correlational relationship between the total reading score and reading comprehension scores for both the regular reading group and dyslexic group.

Study Importance:

Given the continuous increase in the number of students facing reading problems in primary schools, coupled with the significant shortage of centers or specialists to solve such problems, this study aims to investigate dyslexia and its relationship to variables that may affect and be influenced by them. It also identifies the main features of dyslexic children and understands the impact of this difficulty on their comprehension of written and spoken language.

Operational Definitions of Study Variables:

Dyslexia: Difficulty in decoding written symbols that significantly impacts a group of children compared to their peers of the same age, without sensory, intellectual or behavioral disorders. Dyslexia is identified in this study by implementing a reading test including common and uncommon words and pseudowords.

Reading comprehension: The process by which the student recognizes words in a given written text and understands its content, extracting a specific meaning or main idea. Measured by the student's ability to read sentences and indicate the matching image. Represented by their score on the reading comprehension test.

Oral comprehension: The listener's ability to comprehend spoken language and respond correctly. Referring to the student's ability to understand spoken sentences and point to the matching image among options. Represented by their score on the oral comprehension test.

First: Theoretical Part

1- Dyslexia Definition:

It is defined by the Child Development Center at Indiana University Medical Center as: a deficiency in proper reading at the level mastered by peers of the same age and educational stage, occurring as a result of organic, neurological or hereditary factors during the growth period due to a defect in central nervous system development. (Hamza, 2008, p. 53).

Dyslexia is a specific deficiency in acquiring reading skills not attributed to low intellectual age or vision disorders, or inappropriate education, but entails disorders in reading skills, comprehension, word recognition, oral reading, and performance in tasks requiring reading in general.

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders defines "dyslexia" as an alternative term employed to describe one model of reading difficulties focused on the inability to break the code of words and spelling, related to some other difficulties such as reading comprehension and mathematical logic. (DSM-5, 2014)

2- Dyslexia Symptoms:

Dyslexia manifestations vary between individuals, but there are common indicative symptoms indicating the disorder's existence. The following components illustrate the most significant diverse symptoms appearing in children experiencing reading problems:

- Lower than expected reading achievement, less than achievement in math.
- No impairment in hearing or vision senses.
- Difficulty remembering full word patterns.
- Disorder in recognizing similar-looking words.
- Weakness in spelling and oral reading.
- Intelligent and physically, emotionally normal with a desire to learn reading.

- Does not read incorrectly but as they see it.
- Guessing to understand content or word parts.
- Difficulty distinguishing left from right. (Hadj Sabri, 2005)

Second: Applied Part

1- Study Methodology

The selection of the research methodology relies on the nature of the problem statement being studied, leading to variations in the methodologies utilized. For this study examining dyslexia and its relationship to variables causing decline in achievement for primary stage students, the descriptive methodology in its correlational and comparative approaches is most suitable. It focuses on describing the phenomenon under study by collecting facts, data, classifying, analyzing and interpreting results.

2- Study Sample

The sample is one of the most significant field research steps, requiring representation of the original community. This study's sample entails fourth and fifth year primary students, intentionally selected as most appropriate. The sample size was 100 male and female students selected based on exclusion criteria including:

- Clear vision impairment
- Hearing loss (wearing hearing aid)
- Hyperactivity
- Clear speech/language disorder (stuttering for example)
- Significant difficulty comprehending/understanding instructions
- Major weakness in all academic subjects

Table No. (01) shows members sample distribution	
Typical readers in the fourth and fifth years of primary school	70
Dyslexic readers in the fourth and fifth years of primary school	30
Total	100

3. Study Tools

- Description test: One of the tests whose elements are relatively suitable for all cultures, entailing (10) drawings or matrices, each missing a part below with six parts including the missing part. Test-takers should identify the missing part among the group of parts.

- Administration procedures and scoring method: The child is given test cards one by one and asked to determine the part completing the card from six options without time constraint. If the student incorrectly answers (selects another part), their first answer is recorded without requesting repetition and correction. Scoring is:
- Point is given for each correct shape, (0) for unanswered.
- Correct scores obtained are totaled to identify the examinee's overall score on this test. (Al-Damigh, 2011).

4. Psychometric characteristics of study tools:

4.1. Tool validity:

4.1.1. Reading test: Internal consistency validity was calculated by computing the correlation coefficient between sub-tests and overall reading test score.

Table (02) shows the correlation between overall reading test score and its parts.

	Common words	Uncommon words	Pseudowords
Total scores	0.80	0.98	0.90

4.1.2 Reading comprehension test: This is a modified version of the reading comprehension sub-test from the sentence comprehension tests.

4.1.3 Oral comprehension test: This test is part of the oral and written language tests prepared by the Cognitive Psychology Laboratory at Grenoble University.

4.2 Test reliability:

Reliability was calculated utilizing the "Alpha" coefficient, with the following values:

4.2.1 Reading test: The overall alpha coefficient value for the reading test was 0.80, a good value illustrating test reliability.

4.2.2 Reading comprehension test: The alpha value for the reading comprehension test was 0.58, a good value showing test reliability.

4.2.3 Oral comprehension test: The alpha value for the oral comprehension test was 0.87.

Statistical processing methods

To fulfill study objectives and analyze collected data, the following were statistically employed to measure hypotheses and tests: T-test for significance of differences between

independent sample means, and Pearson's coefficient to compute correlation between test scores applied to the sample relied on SPSS version 22 statistical program.

6. Presentation and discussion of results

6.1 Presentation of study results:

6.1.1 Presentation of first hypothesis results:

The following illustrates results of reading comprehension differences between the typical and dyslexic readers groups.

Table (03) shows reading comprehension difference between the two groups.

Group	Mean	Standard deviation	T value	Significance level
Typical readers	9.50	1.50	7.25	0.000
Dyslexic readers	6.75	3.00		

Table 3 shows that there is a statistically significant difference at the significance level of (0.000) between the typical and dyslexic readers groups in reading comprehension.

6.1.2 Presentation of second hypothesis results:

The following table indicates the results of differences in oral comprehension ability between the typical and dyslexic readers groups in reading comprehension.

Table (04) illustrates the difference in oral comprehension between the two groups.

Group	Mean	Standard deviation	T value	Significance level
Typical readers	10.50	1.00	5.33	0.002
Dyslexic readers	6.75	3.32		

The table indicates that there is a statistically significant difference at the level of (0.02) between the typical reading group and dyslexic group in oral comprehension.

6.1.3 Presentation of third hypothesis results:

To verify the third hypothesis, Pearson's coefficient was utilized. The following illustrates the correlation results between reading ability and reading comprehension:

Table (05) shows the correlation between total reading score and reading comprehension for the study sample.

Variable	Overall reading score	Significance level
Reading	0.70	0.00

comprehension		

The above statistical table illustrates a statistically significant relationship at a significance level of (0.00) between reading comprehension scores and total reading score for the study sample, clarifying the correlation between the ability to decode written symbols, read them and comprehend what is read.

Typical students have the ability to recognize symbols, quickly distinguish between letters and pronounce words well without facing comprehension difficulties. Whereas dyslexic students find great difficulty recognizing letters and words, whether common or uncommon, which prevents them from understanding meanings later.

6.2 Discussion of study results:

6.2.1 Discussion of first hypothesis results:

After calculating the "t" value and its statistical significance between dyslexic and typical students, results indicated statistically significant differences between the two groups. The first hypothesis stating "There is a statistically significant difference between dyslexic students and typical students in reading comprehension" was thus confirmed.

Results show regular students have high understanding of read material, unlike dyslexics where the difference in reading comprehension between typical and dyslexic students is clear. It can be said reading comprehension requires visually processing words and conveying phonological and spelling meanings, linking representations to form sentence or text understanding, requiring uniting and conveying concepts - dyslexics struggle processing and matching words with sounds, unable to link representations for sentence comprehension.

6.2.2 Discussion of second hypothesis results:

It is noted that the "t" value and its statistical significance between dyslexic and typical students indicated "a statistically significant difference between the two groups", thus fulfilling the second hypothesis stating "there is a statistically significant difference between dyslexic students and typical students in oral comprehension".

Therefore, we can say that the difference in oral comprehension ability between typical and dyslexic students can be attributed to the child acquiring oral comprehension skills over years before school enrollment, whereas their reading comprehension ability had not yet begun, indicating that their oral comprehension abilities surpass reading abilities by years, equipping them better to handle heard versus read messages.

The effort exerted by students to decode written symbols and recognize meanings is thus greater than for decoding heard symbols, particularly when clearly listening to a read sentence - raising understanding. For dyslexics this process does not occur, suffering problems decoding heard symbols followed by comprehension problems.

6.2.3 Discussion of third hypothesis results:

After calculating the "r" value and its statistical significance between dyslexic and typical students, results indicated that there is a statistically significant relationship between reading ability and reading comprehension. Therefore, the third hypothesis stating "There is a statistically significant correlational relationship between total reading score and reading comprehension scores for both the typical reading group and dyslexic group" was confirmed.

The results of a relationship between reading ability and reading comprehension can be explained by comprehension being a significant element in the reading process, impacting and being influenced by it and its levels - the more accurate the reading, the more precise comprehension. Through correctly recognizing words, sentences and activating reading skills, it leads to higher levels of comprehension and inference - confirmed by Siah (2001) that reading requires a large set of skills employed by the reader when handling a text, such as recognizing written symbols, accessing meanings of vocabulary and sentences, understanding different linguistic structures, utilizing general information and more. For the student to understand, remember information and ideas in the read text, they must be able to activate these skills in the reading process, whereas those lacking these skills will face difficulties comprehending content.

Conclusion:

The primary aim of this study was an attempt to identify the possibility of statistically significant differences between typical and dyslexic students in reading comprehension and oral comprehension abilities. It also sought to determine the relationship between a student's reading ability and their comprehension level scores. The study also endeavoured to familiarize the student with dyslexia diagnosis stages and open the field more to diagnostic studies to identify associated factors and causes of dyslexia.

The study results confirmed statistically significant differences between typical and dyslexic students in reading comprehension and oral comprehension abilities. Thus, reading affects comprehension ability in both its oral and reading forms - developing student reading leads to improved, increased comprehension ability.

Results also demonstrated the relationship between reading comprehension and oral comprehension. It is clear from the above that dyslexia negatively impacts and is influenced by many other abilities, obstructing students' educational progression. This calls for concerted efforts from all approaches to attempt alleviating these difficulties so students can adapt to their school environment.

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