Development of a Dyslexia Scale for Arabic Children for Early Identification

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Abstract
An objective of the study was to develop a measure to evaluate the reading skills of Arabic children to identify those with Dyslexia. It also evaluated psychometric properties. It also extracted the standards from 382 normal children and those with reading problems in primary schools in Saudi Arabia. The researcher relied on the diagnostic criteria in the Diagnostic and statistical manual of mental disorders (5th ed), International Dyslexia Association, some literature on the Arabic language, and special education for building an Assessment Tool. The scale consists of five sub-tests: (Word Recognition Test, Pseudoword Reading Test, Word Spelling Test, Phonological Awareness Test, Reading Comprehension Test). The results revealed that the scale exhibited reliable indicators for factors such as honesty and stability. After the deletion of items, these indicators represented an unacceptable level of ease, difficulty, or discrimination. Moreover, it was able to extract the standards of these tests.

Keywords: Psychometric Properties, Dyslexia, Arabic Language, Reading Skills.

Introduction

The word Dyslexia, which is of Greek origin, consists of two parts: days, meaning "difficulty," and Lexia, meaning "word" or "language" (About Dyslexia, 2020). International Dyslexia Association (2016) defines Dyslexia as a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate or fluent word recognition and poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected about other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems with reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

Scientists and researchers have differing opinions regarding the causes of Dyslexia; some believe it is caused by genetics, and others say it is due to developmental factors. Others, however, see them as environmental factors. However, many factors are causing Dyslexia. It does not see them as entirely separate. It can be said that Dyslexia has a genetic origin that has led to a development problem that has affected the development of learning styles and thus the inability to adapt to the surrounding environment (Almahrag, 2019). The most significant characteristic of children with Dyslexia is their inability to distinguish between letters and numbers with similar shapes. It is like the process of replacing, deleting, or adding alphabet letters to words (Fiset et al., 2006).

Each language has its specificity and distinctive symbols that differ from the other languages due to different cultures among nations and the diverse linguistic heritage of these nations. People with Dyslexia may experience different literacy problems depending on the language they use. Bauer (2022) points out that each language has its characteristics and peculiarities inherent in its symbols. Therefore, Dyslexia is a problem with reading and a failure to use those linguistic symbols. Nearly 237 million people speak Arabic, making it the fifth-largest language globally (Suleiman, 2019). Some immigrant children may master the country's language to which they emigrated. Complex tests of reading in the local language may not be suitable for them. Verbal, Van de Vijver & Backus (2018) also indicate that many difficult-to-read tests and assessments are language-based in their management. That lack of understanding of test language can reduce performance.

The Arabic language has unique characteristics that set it apart from other languages, including the 28 alphabetic characters and the diacritics system. As a result of the difference in diacritics, the pronunciation of the same word is altered, followed by a change in meaning. Abu-Rabia (2021) points out that the Arabic

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language system's complexity and difficulty are due to its dependence on diacritics, which changes the alphabet's pronunciation and, thus, the word's meaning. Since many studies and research in dyslexia measurement were based on the English language, and their results could not be based on the Arabic language, it is necessary to develop tests to measure children with Dyslexia in Arabic-speaking reading.

Assessment of Dyslexia

The American Psychiatric Association (2013) defines it as difficulties inaccuracy or fluency of reading, decoding, speed recognition of vocabulary, and spelling. Furthermore, it is also a problem afflicting the ability to map phonology (i.e., the speech sounds of words) and is unpredictable in individuals, compared to other abilities that are not consistent with chronological age, educational opportunities, or intellectual abilities. Alsaeedi (2009) mentions several studies that relied on indicators (DSM5) in the dyslexia diagnosis, such as Brook Bruck (1993), Snowling (2000), Snowling & Hanley (1997), Miller & Garner (1999), and Everett (2003). The International Dyslexia Association set several criteria for measuring Dyslexia. These include recognizing the family history and that the difference between intelligence and reading skills is no longer the most reliable indicator for predicting the existence of Dyslexia. They point out that an obvious indicator is a disparity between the average oral language skills and the development of written language skills that are shown in children with Dyslexia in the form of difficulty in the accuracy and fluency of word recognition, decoding, reading, and vocabulary deficiency (Sawyer & Jones, 2008).

Many recent studies have verified the psychometric characteristics of a dyspraxia scale for different cultures. Haridas et al (2018) A dyslexia measure for Hindi speakers has been developed to recognize letters and words, spelling, handwriting, evaluation of sound awareness, visual processing, fast label, and motor skills. Jap, Borleffs & Maassen (2017). Also conducted a battery study to measure Dyslexia for Malay-language speakers. It included tests to assess spelling, dictation, arithmetic facts, word recognition, pseudoword reading, an extension of numbers, verbal fluency, and phonematic awareness. Furthermore, the study of Van Witteloostuijn, Boersma, Wijnen, & Rispens (2019) on a sample of the Dutch population included tools for measuring Dyslexia such as nonverbal logic, correctly read words, pseudoword reading, word spelling, and extension numbers.

Likewise, the Saudi Arabian government deals with Dyslexia as part of its learning difficulties program in public education schools without specifying their identity, diagnostic, or teaching practices. Dyslexia is defined as the inability to comprehend aloud or silently and the inability to understand. Wehr & J Milton Cowan (2016) defines Dyslexia as a failure of a person's ability to read, whether aloud or silently, or comprehend what he is reading, with nothing to do with impaired speech.

International Dyslexia Association points out that the most relevant criteria for dyspraxia, highlighted in many studies, are the Word Recognition Test, Pseudoword Reading Test, Word Spelling Test, Phonological Awareness Test, Reading Comprehension Test (Sawyer & Jones, 2008).

Aim of this Study

The measurement of Dyslexia depends on the unique character of the language. Most dyslexia scales are in the English language or other languages, while Arabic has its characteristics. Since there is no scale available for Dyslexia in the Arabic language, preparing an Arabic dyslexia scale may help advance scientific research in this field in the Arab world. This study was designed to develop a measure of reading skills to identify Arabic children with Dyslexia, evaluate psychometric properties, and extract standards.

Materials and Methods

Participants

Data were collected randomly. Study participants included 382 participants, including 220 girls and 162 boys, aged 9 to 11 years from ordinary children and children whose teachers reported reading difficulties. The sample study represents medium economic and social backgrounds from the central regions of Saudi Arabia (Riyadh, Dammam, Jeddah). The participants first filled in the informed consent form and were distributed according to the study's variables, as shown in Table 1.

Table 1. *The demographic information of participants, including Gender, Age, and Region*

Variables	Classification	Number	Percentage
Gender	Male	162	42%
	Female	220	57%
Age	9	214	56%
	10	134	35.1%
	11	34	8.9%
Region	Riyadh,	137	35.9%
	Dammam	156	40.8%
	Jeddah	89	23.3%

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Study Tool

The researcher in the design and preparation of the Arabic dyslexia scale relied on the procedural definition of the Diagnostic and Statistical Manual of Mental Disorders DSM-V, which corresponds to the diagnostic criteria set out in the latest revision of the Manual (American Psychiatric Association, 2013). Also used are the diagnostic criteria of the International Dyslexia Association (Sawyer & Jones, 2008). Furthermore, several of the studies mentioned above used different approaches to measure reading hardness.

The researcher concluded that Dyslexia could be measured through tests that include measuring Word recognition, Pseudoword Reading, Word spelling, Phonological Awareness, Reading Comprehension. The researcher, using a set of literature in special education, The Arabic language books of primary school at the Saudi education Ministry curricula, and the scale designed as follows:

Word Recognition Test: The test aims to measure the accuracy and fluency of word reading by calculating the number of words read correctly. The test consists of 25 words that begin with two letters and end with six. The test is applied individually. Then, the children are asked to read the terms presented to them as quickly as possible; there is no ceiling limit time required for this test. It gives one score for each word read correctly and a zero for each word that has not been read correctly. The overall grade of the exam is the sum of the right word reading.

Pseudoword Reading Test: The test aims to recognize the ability of a child to decrypt by pushing them to pronounce strange word letters (which have no linguistic meaning). The test consists of (25) words, and it presents them as a list of words on one page. The test is applied individually. The test needs the pseudoword reading list form and the examining person's scoring form; it gives one score for each word read correctly and a zero for each word that is not read correctly. The overall grade of the exam is the sum of the right word reading.

Word Spelling Test: The spelling test is designed to identify the child's ability to spell the words heard. The test consists of (25) words. The test is applied individually. The child listens for each word and then tries to spell it out and write it correctly in the answer form prepared for that. It gives one score for each word read correctly and a zero for each word that has not been read correctly. The overall grade of the exam is the sum of the words written right.

Phonological Awareness Test: The test aims to measure the ability of the child to read a word after deleting some sounds from them so that the reviews will pronounce a word and then pronounce it again after deleting one sound or more. The test begins with a compound item and consists of (25) words. The test is applied individually. It gives one score for each item read correctly and a zero for each item that has not read correctly. The overall grade of the exam is the sum of the right word reading.

Reading Comprehension Test: The purpose of the Reading Comprehension Test is to measure the child's ability to understand the words read, and the test consists of 25 questions. The test is applied individually. The test consists of a sentence missing a word. The child chooses from four choices to complete the sentence as soon as possible. The test needs an answer form and a pen. It gives one score for each selection correctly and a zero for each choice that has not read correctly. The overall grade of the exam is the sum of

Results

Psychometric Characteristics of the Arabic Dyslexia Scale

To ensure the scale's validity and reliability in an Arab environment. The scale was presented to selected arbitrators, special education specialists, psychologists, learning difficulty teachers, and Arabic teachers. The arbitrators agreed that the language of the scale was clear, appropriate, and relevant to the purpose for which it was designed. This was about dyslexic children's reading abilities. There was also no comment on the change, deletion, or addition of paragraphs to the tests.

To ensure the scale's internal consistency, the researcher calculated the correlation coefficient between each of the scale phrases to the full degree using Pearson's correlation coefficient. Furthermore, the researcher estimated the item's difficulty and discrimination. The investigator relied on excluding items with a value of less than (0.10). Those items represented difficulty, and items that reached a significant value beyond (0.90) meant items that were easy to answer. The discrimination factor refers to the item's ability to distinguish between low-attainment sample members and high-attainment individuals in reading capacities (Viebach, 2018). The researcher relied on excluding items where the differentiation coefficient is less than (0.20). That shows in the tables (2-6). The sample consisted of 382 Saudi Arabian students in primary school, including ordinary students and students with reading problems.

Table 2. *Pearson's correlation, Items Difficulty and Items Discrimination for Word Recognition Test*

Part number	Item Difficulty	Correlation coefficient	Item Discrimination

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1	0.66	**0.533	0.40
2	0.37	**0.527	0.34
3	0.37	**0.548	0.40
4	0.43	**0.536	0.37
5	0.45	**0.419	0.35
6	0.41	**0.417	0.29
7	0.43	**0.476	0.32
8	0.39	**0.393	0.31
9	0.44	**0.423	0.28
10	0.41	**0.355	0.26
11	0.43	**0.524	0.39
12	0.41	**0.400	0.33
13	0.42	**0.428	0.32
14	0.44	**0.475	0.34
15	0.39	**0.475	0.38
16	0.39	**0.527	0.41
17	0.40	**0.397	0.30
18	0.44	**0.435	0.37
19	0.36	**0.520	0.39
20	0.36	**0.572	0.42
21	0.33	**0.397	0.29
22	0.35	**0.552	0.45
23	0.33	**0.498	0.41
24	0.27	**0.431	0.32
25	0.23	**0.327	0.25

** is a function at 0.01

The statistical results mentioned above in Table 2 for the Word Recognition Test show that each item's coefficient with the test's overall score statistically function at the significance level (0.01) and below. All sections are more complex than (0.10), more manageable (0.90), and more distinguishable (0.20), indicating that test items are suitable for measuring after well-word recognition.

Table 3. *Pearson's correlation, Items Difficulty, and Items Discrimination of Pseudoword reading test*

Number of Items	Item Difficulty	Correlation coefficient	Item Discrimination
1	0.59	**0.486	0.35
2	0.38	**0.410	0.26
3	0.49	**0.451	0.31
4	0.42	**0.433	0.37
5	0.54	**0.454	0.32
6	0.43	**0.373	0.29
7	0.53	**0.442	0.34

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8	0.44	**0.375	0.26
9	0.48	**0.426	0.30
10	0.46	**0.427	0.36
11	0.47	**0.369	0.23
12	0.45	**0.346	0.26
13	0.42	**0.431	0.30
14	0.46	**0.386	0.28
15	0.43	**0.459	0.34
16	0.40	**0.479	0.36
17	0.39	**0.476	0.41
18	0.33	**0.546	0.46
19	0.31	**0.527	0.41
20	0.30	**0.537	0.40
21	0.25	**0.560	0.34
22	0.24	**0.580	0.36
23	0.19	**0.571	0.36
24	0.14	**0.510	0.25
25	0.08	**0.430	0.16

** is a function at 0.01

The statistical results in Table 3 for the reading of the pseudoword reading test show that each item's coefficient with the test's overall score is statistically significant at the significance level (0.01) or below. Except for item (25) which has a coefficient of ease (0.08) and a coefficient of differentiation (0.16), all items are more complex than (0.10), more manageable (0.90), and more distinguishable (0.20). So, the test became suitable for measuring Pseudoword Reading after eliminating this item.

Table 4. *Pearson's correlation, Items Difficulty, and Items Discrimination of Word Spelling Test items*

Number of Items	Item Difficulty	Correlation coefficient	Item Discrimination
1	0.58	**0.303	0.30
2	0.42	**0.287	0.19
3	0.52	**0.332	0.26
4	0.48	**0.404	0.31
5	0.55	**0.326	0.24
6	0.49	**0.422	0.33
7	0.53	**0.346	0.24
8	0.48	**0.430	0.34
9	0.50	**0.425	0.34
10	0.46	**0.509	0.39
11	0.50	**0.464	0.41
12	0.40	**0.517	0.44
13	0.42	**0.512	0.49

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14	0.40	**0.556	0.49
15	0.36	**0.515	0.44
16	0.36	**0.538	0.51
17	0.34	**0.590	0.49
18	0.31	**0.549	0.45
19	0.28	**0.581	0.43
20	0.25	**0.554	0.36
21	0.25	**0.604	0.39
22	0.22	**0.566	0.35
23	0.19	**0.611	0.33
24	0.15	**0.522	0.25
25	0.04	**0.352	0.08

** is a function at 0.01

The statistical results mentioned above in Table 4 for the Word Spelling test show that each item's coefficient with the test's overall score statistically function at the significance level (0.01) and below. All items are more complex than (0.10), more manageable (0.90), and more distinguishable (0.20), except item (25) that has an ease coefficient of 0.04 and a differentiation coefficient of 0.8. The test now can measure Word Spelling after this item is eliminated.

Table 5.*Pearson's correlation, Items Difficulty, and Items Discrimination of Phonological Awareness test items*

Number of Items	Item Difficulty	Correlation coefficient	Item Discrimination
1	0.65	**0.327	0.26
2	0.38	**0.321	0.27
3	0.51	**0.460	0.39
4	0.52	**0.552	0.52
5	0.46	**0.362	0.27
6	0.54	**0.467	0.37
7	0.57	**0.495	0.47
8	0.47	**0.395	0.29
9	0.50	**0.376	0.41
10	0.53	**0.488	0.47
11	0.46	**0.515	0.30
12	0.45	**0.547	0.43
13	0.43	**0.546	0.47
14	0.40	**0.561	0.38
15	0.37	**0.523	0.46
16	0.36	**0.547	0.42
17	0.29	**0.544	0.43
18	0.29	**0.491	0.36
19	0.26	**0.532	0.32

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20	0.24	**0.485	0.33
21	0.23	**0.370	0.29
22	0.16	**0.327	0.25
23	0.14	**0.321	0.22
24	0.10	**0.460	0.19
25	0.05	**0.552	0.10

** is a function at 0.01

The statistical results mentioned above in Table 5 for the Phonological awareness test show that each item's coefficient with the test's overall score statistically function at the significance level (0.01) and below. All items are more complex than (0.10), more manageable (0.90), and more distinguishable (0.20), except item 24, which has a coefficient of differentiation of 0.19. Moreover, item 25 has the coefficients of ease (0.05) and differentiation (0.10). So, the test became suitable for measuring Phonological awareness after eliminating these items.

Table 6. *Pearson's correlation, Items Difficulty, and Items Discrimination of Reading Comprehension Test*

Number of Items	Item Difficulty	Correlation coefficient	Item Discrimination
1	0.56	**0.356	0.24
2	0.34	**0.386	0.28
3	0.38	**0.498	0.42
4	0.42	**0.461	0.35
5	0.41	**0.492	0.39
6	0.43	**0.535	0.46
7	0.43	**0.532	0.43
8	0.42	**0.503	0.38
9	0.41	**0.525	0.44
10	0.47	**0.536	0.46
11	0.44	**0.468	0.39
12	0.41	**0.547	0.45
13	0.44	**0.540	0.39
14	0.42	**0.477	0.42
15	0.39	**0.477	0.36
16	0.37	**0.578	0.44
17	0.40	**0.473	0.38
18	0.34	**0.485	0.36
19	0.39	**0.488	0.38
20	0.29	**0.464	0.32
21	0.33	**0.479	0.32
22	0.29	**0.474	0.33
23	0.24	**0.417	0.26
24	0.21	**0.494	0.30
25	0.18	**0.412	0.18

** is a function at 0.01

The statistical results mentioned above in Table 6 for the Reading Comprehension Test show that each item's coefficient with the test's overall score statistically function at the significance level (0.01) and below. Items are more complex than (0.10), more manageable (0.90), and more distinguishable (0.20), except item (25), whose differentiation coefficient is 0.18. So, the test became suitable for measuring the Reading Comprehension Test after eliminating this item.

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Table 7. *Pearson's correlation among dyslexia and the subtests e*

The Subtest	Number of items	Correlation coefficient
Word Recognition Test	25	**0.377
Pseudoword Reading test	25	**0.532
Word Spelling Test	25	**0.538
Phonological Awareness Test	25	**0.490
Reading Comprehension Test	25	**0.486

** is a function at 0.01

The statistical results mentioned above in Table 7 for the dyslexia scale show that each test coefficient with the test's overall score statistically functions at the significance level (0.01), thereby indicating the validity of the scale's internal consistency.

Table 8. *The reliability of the subtests and total score (Coefficient Alpha coefficient)*

The Subtest	Number of items	Coefficient Alpha coefficient
Word Recognition Test	25	0.84
Pseudoword Reading Test	24	0.85
Word Spelling Test	24	0.85
Phonological Awareness Test	23	0.85
Reading Comprehension Test	24	0.86
Overall Reliability	120	0.85

The above statistical findings in table 8 show that the overall stability factor for the sample study in Saudi Arabia on the Arabic dyslexia scale after deleting the non-fair, easy, complex, and undifferentiated items using Croefficint Alpha coefficient was (0.85.) The value of the sub-test stability coefficients was as follows: The Word Recognition Test (0.84), the Pseudoword reading test (0.85), the Word Spelling Test (0.85), the Phonological awareness Test (0.86), the Reading Comprehension Test (0.85), all of which are considered high values according to commonly accepted standards of evidence in the human sciences, This confirms that the scale as a whole and its sub-tests have a high degree of stability to be reliable.

Exploratory Arabic Dyslexia Scale Standards

To extract the standards of the sub-tests of the scale and to include the results in a table. As shown in Table 9 and Table 10 criteria for each subtest, the researcher used the Statistical Package for Social Science (SPSS) to calculate Z scores and ordinal levels.

Table 9.*Standards of recognizing words Pseudoword Reading, and Word Spelling*

Word Recognition			Pseudoword Reading			Word Spelling		
Ordinal level	Raw score	Z scores	Ordinal level	Raw score	Z scores	Ordinal level	Raw score	Z scores
99.89	25	2.70	100	24	2.77	99.87	23	2.63
99.35	24	2.52	99.61	23	2.58	99.48	22	2.44
98.95	23	2.34	98.95	22	2.39	99.08	21	2.25
98.30	22	2.16	98.04	21	2.20	98.17	20	2.07
97.25	21	1.98	96.73	20	2.01	96.60	19	1.88
96.07	20	1.80	95.03	19	1.82	94.63	18	1.69
93.72	19	1.62	92.67	18	1.62	90.97	17	1.50
89.40	18	1.45	89.27	17	1.43	89.26	16	1.31
84.69	17	1.27	85.08	16	1.24	82.59	15	1.13
80.89	16	1.09	81.81	15	1.05	79.45	14	0.94
78.01	15	0.91	78.93	14	0.86	85.39	13	0.75
74.48	14	0.73	75.13	13	0.76	70.55	12	0.56
70.20	13	0.55	72.51	12	0.48	67.15	11	0.37
69.76	12	0.37	70.03	11	0.28	62.70	10	0.19
67.15	11	0.20	63.22	10	0.09	55.24	9	0.0
60.86	10	0.02	50.92	9	-0.10	47.25	8	-0.19
48.95	9	–0.16	38.61	8	–0.29	40.18	7	–0.38

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37.96	8	–0.34	31.28	7	–0.48	33.38	6	–0.57
32.20	7	–0.52	26.18	6	–0.67	25.92	5	–0.75
26.96	6	–0.70	19.90	5	-0.86	19.37	4	-0.94
20.55	5	–0.88	15.05	4	–1.06	13.74	3	–1.13
15.05	4	–1.06	11.65	3	–1.25	8.64	2	–1.32
10.60	3	–1.23	7.20	2	–1.44	4.19	1	–1.51
6.41	2	–1.41	3.14	1	–1.63	1.05	0	–1.70
3.14	1	–1.59	0.79	0	–1.82			
0.79	0	–1.77						

The above statistical findings in table 9 show that the ordinal level for the Word Recognition Test varied from (99.89-0.79), and the Z scores (2.70-1.77). Based on the Pseudoword Reading test, the ordinal level ranged from 100 to 0.79, and the Z scores ranged from 2.77 to 1.82. The ordinal level for the word spelling test ranged from (99.87-1.05), and the Z scores (2.63-1.70).

Table 10. *Standards of Phonological Awareness and Reading Comprehension*

Phonological Awareness			Reading Comprehension		
Ordinal level	**Raw score**	**Z scores**	**Ordinal level**	**Raw score**	**Z scores**
100	23	2.63	99.87	24	2.62
99.61	22	2.44	99.35	23	2.44
98.95	21	2.25	98.82	22	2.27
98.17	20	2.07	97.64	21	2.09
96.99	19	1.88	96.07	20	1.91
95.03	18	1.69	94.50	19	1.73
92.02	17	1.50	92.28	18	1.56
87.57	16	1.31	87.57	17	1.38
82.98	15	1.13	82.59	16	1.20
78.80	14	0.94	80.10	15	1.02
73.95	13	0.75	77.88	14	0.85
70.16	12	0.56	74.61	13	0.67
66.62	11	0.37	70.47	12	0.49
60.47	10	0.19	68.06	11	0.31
51.96	9	0.0	62.70	10	0.14
42.67	8	-0.19	58.58	9	–0.04
35.21	7	–0.38	46.34	8	–0.22
30.24	6	–0.57	39.92	7	-0.40
24.35	5	–0.75	33.25	6	–0.57
18.59	4	-0.94	25.13	5	–0.75
14.01	3	–1.13	18.98	4	–0.93
9.03	2	–1.32	14.01	3	–1.10
4.58	1	–1.51	8.90	2	–1.28
1.31	0	–1.70	4.71	1	–1.46
			1.18	0	–1.64

The above statistical findings in table 10 show that the ordinal level for the Phonological awareness test ranged from (100-1.31), and the Z scores (2.63-1.70). As for the Reading Comprehension test, the ordinal level ranged from (99.87-1.18), and the Z scores were (2.62-1.64).

To define a precise description of the sub-test scores, the researcher divided the categories according to the qualitative report in Table 11 and accordingly distributed the grades to Percentile rank and z scores.

Table 11. *Qualitative description of the grade of the dyslexia scale*

Qualitative Description	Ordinal level
Low	**1 – 5**
Poor	**10 – 20**
Below average	**30 – 40**
Medium	**50**

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Good	**60 – 70**
Superior	**80 – 90**

Discussion

The researcher, in preparing the Arabic-language dyslexia measure, used international standards with relevant dyslexia considerations. That is are the diagnostic criteria contained in the latest revision of the Diagnostic and Statistical Manual of Psychiatry (DSM5) American Psychiatric Association (2013), as well as the requirements of the International Dyslexia Association (2002).

In theory, it is true that the use of such standards results in a higher degree of accuracy in the construction of the scale. Several recent studies in Dyslexia from different cultures have relied on these criteria in the diagnosis of Dyslexia. Such as Jap, Borleffs & Maassen (2017), Huang, Wu, Li, Zhang, Lin & Huang (2020), and Hou, Qi, Liu, Luo, Gu, Xie, Li, Zhang & Song (2018) and Juneja, (2018), which is characterized by its focus on building a scale for reading-impaired Arabic-speaking children.

The current scale may consist of five subtests (word recognition, pseudoword reading, word spelling, phonological awareness, and reading comprehension). The scale showed that its psychometric properties are suitable for measuring and diagnosing Arabic-speaking children with difficult reading after deleting some items from some tests in the hierarchy that showed a level of difficulty, ease, or improper discrimination. The researcher has also been able to extract the criteria for sub-tests of the scale. It identifies the grade of the study sample responses. It prepares a description that is adequate for interpreting these results to identify people who cannot read and identify readers' problems. As such, we provide them with adequate educational programs to improve their reading levels.

The current scale is the first of its kind in the Arab world. The items were prepared with consideration for the characteristics and nature of the Arabic language, and were arbitrated by specialists in special education, psychology, and Arabic language, and verified to be suitable for use with children exposed to difficult Arabic-speaking reading. A researcher noted that study subjects, such as parents, encouraged their children to participate in the study, believing that developing an accurate tool to measure reading hardness may meet the needs of their children and accurately diagnose them. The scale was made up of five subtests in its final form and is as follows (25- items Word Recognition Test, 24- items Pseudoword Reading, 24- items Word Spelling, 23- items Phonological Awareness, 24- items Reading Comprehension), a total of 120 items for the full scale.

Recommendations

The researcher recommends that the relevant authorities in the Arab world adopt the financial hardship measure suggested in this study. It will enable them to measure children's reading abilities with reading problems and train teachers in using it. In addition, the researcher encourages further development of this measure by doing further research on different Arab societies. Furthermore, the researcher will develop other suitable measures of reading hardness for young people and adults in the **Arab world in future studies.**

Conflict of Interest

We have no conflicts of interest to disclose.

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