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Full Length Research Paper

Standardization of normative tools for early detection of learning disabilities among schools students in the West Bank and Gaza Strip

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Abstract

The aim of this study was to standardize normative tools for early detection of learning disabilities among school students in the West Bank and Gaza Strip.The sample process include pilot phase for the first study which aimed in testing the learning screening batteries including (Arabic and English Language, mathematics, and IQ) by selecting sample of 148 students from West Bank and 66 students from Gaza Strip. Following the item analysis from the pilot study, in the second study we randomly selected a sample of 1283 students from the second, third, and fourth grade class from governmental, UNRWA, and private schools. Six hundred and ninety two were boys which represented (53.9%) and 591 were girls which represented (46.10%). Age ranged from 7-9 years with mean age 7.96 years. For first study (pilot), a screening battery consisted of four parts (Arabic language as first language in reading and writing, English as second language, mathematics, and IQ Test). After item analysis and validity of each item with the total score of each scale, items with low significant value were removed. For the second study, the valid screening batteries were used again (Arabic, English, Mathematics and IQ Test).The results of the first pilot study showed that the instruments used were valid and reliable in testing the learning difficulties and disabilities in Palestinian children, for the second study, 28.2% of children reported learning disability in Arabic Language, 19.2% reported learning difficulties in English language, and 22.3% reported disability in Mathematics. There were no statistically significant differences in Arabic and English language disability scores between the two sites of the study. However, learning difficulties and disabilities in Mathematics scores were more in children from Gaza Strip. There were statistically significant differences in difficulties and disabilities in Arabic Language toward children enrolled in governmental schools more than those in UNRWA or private schools.These preliminary findings suggest that the tools standardized in the Arabic Culture may help to identify children with learning and intellectual disability among those with potential need for specialist care.

Keywords: Palestinian Children, Standardize instruments, Learning disability, Arabic, English, Mathematics, IQ.

INTRODUCTION

Since the term learning disabilities was first used, in 1963, learning disabilities has proven to be one of the most confusing, contentious, and contradictory of the disabling conditions.

There has been ongoing debate about the definition of learning disability among professionals from several disciplines, including medicine, psychology and education. The most cited and utilized definition is that of the National Joint Committee on Learning Disabilities, which states: "Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulty in the acquisition and use of

listening, speaking, reading, writing, reasoning, or mathematics abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviour, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences'' (National Joint Committee on Learning Disabilities, 1988, 1994, 2011).

In the International Classification System (ICD-10; World Health Organization, 1992), Learning Disabilities are described as specific developmental disorders of scholastic skills (F81). According to domain-specific contents, a specific reading disorder (F81.0), often called developmental dyslexia, a specific spelling disorder (F81.1), and a specific disorder of arithmetic skills (F81.2), also called dyscalculia, are differentiated.

While Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition defined Learning Disorders as "Learning Disorders are diagnosed when the individual's achievement on individually administered, standardized tests in reading, mathematics , or written expression is substantially below that expected for age, schooling, and level of intelligence. The learning problems significantly interfere with academic achievement or activities of daily living that require reading, mathematical or writing skills, a co-morbid mental disorder or general medical condition, or the individual's ethnic or cultural background. If a sensory deficit is present, the learning difficulties must be in excess of those usually associated with the deficit. Learning Disorders may be persistent into adulthood'' (American Psychiatric Association, 1994).

Furthermore, DSM- IV-TR classified the learning disorder as: Reading disorders (F81.0), Mathematics Disorder (F81.2), Disorder of Written Expression (F81.8) and Learning Disorder Not Otherwise Specified (F81.9). Learning Disorders are diagnosed when the individual's achievement on individually administered, standardized tests in reading, mathematics, or written expression is substantially below that expected for age, schooling, and level of intelligence (American Psychiatric Association, 2000).

Recently, DSM-V (2013) had new category for learning disability (specific learning disorder) which classifies as Specific Learning Disorder with impairment in reading (specify if with word reading accuracy, reading rate or fluency, reading comprehension) (F81.0), Specific Learning Disorder with impairment in written expression (specify if with spelling, accuracy, grammar and punctuation accuracy, clarity or organization of written expression) (F81.81), Specific Learning Disorder With impairment in mathematics (specify if with number sense, memorization of arithmetic facts, accurate or fluent calculation, accurate math reasoning) (F81.2) . Specify current severity: Mild, Moderate, Severe (American Psychiatric Association, 2013).

Approaches for the Identification of learning disabilities

Importantly to note that students with learning disabilities present inferior results on standardized tests that assess abilities and achievement but that the result of IQ in these students will be adequate to the norm. Traditionally, the identification of reading disabilities has been the domain ofthe special education process, with an emphasis on a discrepancy between ability, usually defined as intelligence (IQ), and achievement, as measured by standardized, norm-referenced tests. In the following we will discuss two models:

The IQ-Achievement Discrepancy Model

An exceedingly popular but now largely discredited approach to diagnosing learning disabilities is the discrepancy model where in the presence of a marked disparity between an individual's IQ and performance on academic tasks is taken to signify the presence of learning disabilities (Willis & Dumont, 2006). Students with learning disabilities do not have lower IQ and the IQ test is just to confirm the absence of intellectual disability and that it is necessary to focus on the assessment of skills and ability to achievement of these students.

Choosing appropriate criteria for diagnosing learning disabilities (LD) is undoubtedly one of the most debated and dubious tasks in the fields of special education and general education. In USA, methods for identifying students as having learning disabilities (LD) in schools commonly reflect the 1977 approach to the operationalization of the federal definition of LD. This approach suggested that LD be identified as "a severe discrepancy between achievement and intellectual ability" in one or more of the areas: (1) oral expression; (2) listening comprehension; (3) written expression; (4) basic reading skill; (5) reading comprehension; (6) mathematics calculation; or (7) mathematic reasoning. The child may not be identified as having a specific learning disability if the discrepancy between ability and achievement is primarily the result of: (1) a visual, hearing, or motor handicap; (2) mental retardation; (3) emotional disturbance, or (4) environmental, cultural, or economic disadvantage (U.S. Office of Education, 1977, p. G1082).

Moreover, others postulated that the fundamental bases for assessing learning disabilities involve the use of a valid measure of intelligence and an assessment of

academic content areas including reading, mathematics, and spelling through achievement tests (Sattler, 1988). The most widely used test of intelligence is the Wechsler Intelligence Scale for Children-Revised WISC-III (Wechsler, 1991). This test is composed of Verbal and Performance sections, both of which consist of six subtests, although only five are used in the calculation of the particular IQ score of which they are a part. Each subtest counts for 20% of the scale of which it is a part and 10% of the full scale IQ scores. The subtests of the Verbal scale measure linguistic, computational, and memory skills, and the subtests of the performance scale measure visual-spatial abilities, fine motor coordination, and perceptual skills. Despite the controversy regarding the discrepancy definition of learning disabilities, IQ testing remains an integral part of the assessment process. In particular, IQ tests have been repeatedly shown to be correlated with and predictive of school achievement, and consequently they may guide expectations regarding rate of achievement for a particular child. Furthermore, IQ tests such as the WISC-III provide a profile of strengths and weaknesses, important to understanding the nature of a child's learning style and helpful in planning remedial or treatment programs. Assessing an array of cognitive processes including verbal, visuospatial, and constructional and planning processes is important. Characteristic features of WISC-III profiles among learning-disabled children include variability among subtests and lower mean scale scores on certain groupings of subtests such as the Symbol Search, Coding, Mathematics, and Digit Span subtests (Prifitera & Dersh, 1993). Patterns of scores on IQ tests are not diagnostic of learning disabilities, however, nor do they differentiate learning-disabled children from other exceptional children (Kaufman, 1994). Furthermore, a significant discrepancy between Verbal and Performance IQ alone does not constitute grounds for a diagnosis of learning disabilities.

The IQ-achievement discrepancy model has several limitations. First, while intelligence is a relatively good predictor of academic achievement (effect sizes in their 0.3 to .5 range; Sternberg et al., 2001), there is a great deal of variance (75% to 90%) unaccounted for by IQ (Sternberg et al., 2001). Simply performing below one's measured IQ is not a strong predictor of impairment (Lovett et al., 2009). Therefore, a result, many researchers have advocated for a definition of LD wherein intelligence has no role Second, even though low academic achievement is integral to the concept of LD (Speece et al., 2003), the discrepancy model fails to clearly define what it means to be achieving below average. High-IQ students identified by this method often achieve at or above grade level (Fletcher et al., 2005). On the other side, low-achieving children commonly show achievement greater than their measured IQ and thus don't produce an IQ-achievement discrepancy and as such are not identified, even though it is apparent that they are struggling academically. A third limitation of the discrepancy model results from the statistical phenomenon of regression to the mean. Generally, achievement scores will fall somewhere between a person's IQ and the mean. Those with higher than average IQs will typically produce scores that are somewhat closer to average (but below their IQ) on tests of achievement, whereas those with lower than average IQs tend to achieve at levels higher than their IQ (Cone & Wilson, 1981; Evans, 1992). A *discrepancy between an individual's IQ score"* stating that the student has the IQ score in the average or above.

The Academic Impairment Model of Learning Disability

The majority of current experts in the field of **learning disability** (LD) have championed diagnosis of LD based on academic impairment relative to most other individuals. Whereas discrepancy definitions do not require academic impairment in the absolute sense, (as a student may have only average achievement in the presence of above average IQ), most contemporary scholars in this field currently emphasize that academic impairment in the absolute sense is essential to the definition of LD. For instance, Dombrowski et al. (2004) proposed a definition that would require academic impairment as the main criterion for diagnosis of LD. In their model, students who achieve below average both in the classroom and on standardized tests of achievement (one standard deviation (SD) or more below the mean), who evidenced such problems well before age 18 and for whom other causes of learning failure had been ruled out would be diagnosed as LD.

The NJCLD (2011) defines that individuals with LD may experience significant difficulties in one or a combination of areas of academic performance. The NJCLD agree that there eight areas of underachievement: listening comprehension, verbal expression, basic reading skill, reading fluency, reading comprehension, written expression, mathematical computation, and mathematical problem solving. It's important to mention the explanatory model of NJCLD because they are reference in the field.

Epidemiology of learning disability

Estimates of the prevalence rate of reading disorders depend on the particular definition used. The field had been dominated by the Isle of Wight studies of Rutter et al. (1970) and Rutter and Yule (1975), in which a bimodal distribution of reading disorders was found. The "hump" at the lower end of the distribution was thought to reflect specific reading disabilities with an average prevalence of 5%.

Rohl et al., (2000) examined the prevalence of learning difficulties in a 164 J.L. Skues and E.G. Cunningham national survey of schools (n = 377) where 65% of

respondents (i.e., teachers, principals) estimated that between 10 and 30% of students experienced learning difficulties. Westwood and Graham (2000) examined the proportion of students with special needs in a sample of 1919 students across 41 primary schools in South Australia (SA) and 36 primary schools in New South Wales (NSW). They found that teachers identified 33% of students in South Australia and 28% of students in NSW as having special needs. More specifically, teachers reported that between 7% and 12% of students experienced learning difficulties. Moreover, Bartak and Fry (2004), asked a group of 60 Victorian primary and secondary teachers to describe students with special needs in their classrooms. Teachers reported that 10% of the total number of students (n= 1505) were identified as experiencing learning difficulties. In Germany, a study found that about 3% to 7% of all school-aged children and youth are diagnosed as having attention deficit with hyperactivity disorder, 4% to 8% are identified as students with a reading disorder, 4% to 6% meet the criteria of dyscalculia, and up to 10% show signs of a general learning disability (Lauth et al., 2008). In Israel, the Ministry of Health reported that about 5% of children reported learning disability and were identified as children with attention deficit disorder and attention deficit with hyperactivity disorder (http://cms.education.gov.il/NR/rdonlyres/ C194DAF7-F610-4111-A9B8-9491C806ECC8/131831/gilion104.pdf).

The severity of the learning disability is rated by three levels of learning and testing accommodations and the students' supportive needs. In 2011, 5.29% of students who participated in the national examinations at the end of high school (Bagruth) were identified as students with learning disability, entitled to major accommodations (Levels 2–3). The national controller reported a higher percentage (about 15%) of children received various levels of accommodations (Sharabi & Margalit, 2009). In studies carried out in the Canary Islands, Jimenez, Guzman, et al. (2009) selected a random sample of 1,050 children to identify students with learning disability. They compared the information provided by teachers, based on a standard curriculum, with specific diagnostic criteria based on psycholinguistic research. From a sample that was identified by teachers with learning disability (n = 293), only 91 students were identified as learning disability by a psychometric criteria (8.6%). This represents 8.6% from the total study sample (N = 1,050), 3.2% had dyslexia and 5.4% had difficulties in spelling according to teachers' reports. Gonzalez et al. (2010) examined secondary schools and their sample consisted of 945 students. Teachers identified 291 students with learning disability and 55% (n = 160) of these students had learning disability determined by psychometric criteria. Thus, 16.9% of the students were identified as students with learning disability, of which only 3.2% (n = 30) were students with dyslexia.

A diagnostic battery for Chinese reading disabilities developed by Ker (2007) is based on the simple view of reading model and includes assessment for difficulties in word reading (dyslexia), comprehension (hyperlexia), and both word reading and comprehension. Slightly more than 10% of students were diagnosed as students with reading disabilities under these three subtypes (Hung et al., 2008).

In study of Vijayalaxmi et al (2012) to measure the prevalence of specific learning disabilities (SpLDs) such as dyslexia, dysgraphia and dyscalculia among primary school children in a South Indian city. A cross-sectional multi-staged stratified randomized cluster sampling study was conducted among children aged 8–11 years from third and fourth standard. The prevalence of specific learning disabilities was15.17% in sampled children, whereas 12.5%, 11.2% and 10.5% had dysgraphia, dyslexia and dyscalculia respectively.

Palestinian Central Bureau of Statistics and Ministry of Social Affairs (2011) in survey of a sample of 15,572 households in the Palestinian Territory. The survey showed that the prevalence of learning disability was 23.6% in the West Bank and 26.9% in Gaza Strip (PCBS, 2011).

Education system in Palestine

The organizational structure of education in Palestine consists of a ten-year period of free compulsory basic education that begins at the age of five years and eight months, followed by a two-year programme of secondary academic or vocational education. At the end of the two years, students take the secondary school examination called tawjihi. http://www.mohe.gov.ps/.

Palestinian Education Authorities

There are various types of educational institutions in Palestine. Government schools comprise 70 percent of a total of 2,488 schools in 2009/2010. UNRWA supervises 20 percent of these schools, and the public and private sector supervise 10 percent of the total school population. Seventy-five percent of the students of the total number of 1.18 million male and female students attend government schools, whereas 25 percent go to UNRWA and private schools. http://www.mohe.gov.ps/

In our study we adopted the most common operational definition of unexpected difficulty became a discrepancy between an individual's IQ score and his or her achievement score in reading. According to the U.S. government eligibility of learning disabilities definition based on a "severe discrepancy" between ability and achievement (U.S. Office of Education, 1977, 1999, 2011). In order to achieve our study objectives we carried out two stage study design as follow:

First study (Pilot).

The aim of this study was to test normative tools for assessment of academic content areas including reading Arabic and English language, mathematics, and developing normative data for the identification of learning difficulties in reading and writing tests among student in grades second to ninth grades within the regular classroom in West Bank and Gaza Strip.

Methodology

Subjects

The pilot phase for testing the screening batteries was implemented by selecting a sample of 148 students from West Bank schools (Nablus, Ramallah, Jerusalem, Bethlehem and Hebron Governorates). A total number of 66 students from the Gaza Strip (Gaza, West Gaza, Middle area, Khan Younis, and Rafah) were selected from second to ninth grades.

Instruments

The pilot study focused on the development of normative tests for the identification of learning difficulties in reading and writing in Palestinian children in second to ninth grades within the regular classroom. Child Institute – Al-Quds University used the four screening batteries of Arabic, English, Mathematics, and IQ tests. This phase included developing all tests items and tasks for the screening batteries, translating and adapting the tests into Arabic and devising a scoring system. We were careful to develop two versions of each test, thus doubling the amount of items. This is a precaution adopted to guarantee that a sufficient number of reliable items will remain to allow the construction of a good final version of the tests after the item analysis.

Description of the Pilot study instruments

The data was collected from children by using the following questionnaires:

Demographic questionnaire

Demographic information about the participants was obtained using a survey developed by the authors. This questionnaire includes sex, age, and place of residence.

Learning disability screening instruments for children in second to ninth grades

Arabic Language

Second to ninth grades

It consists of 11 tests with 68 questions and 365 units. Questions included the following: 1) Open and merge of tones which consisted of 25 sentences in which the child will chose the missed word from few words in a bracket, 2) Understanding reading of words consists of paragraph and the child had to answer 8 multiple choice questions, 3) Dictation of 40 words, 4) Copy and comprehension: in the first part the child was asked to listen to the teacher reading a paragraph and then he asked to write the paragraph again and the second part included comprehension about the child school , 5) Listening: in which 150 words were shown and the child should chose the names of animal in two minutes, 6) Words: in which the child is give 100 wrong words concerning food, and he had to choose the words concerning the food, 7) Listening, the teacher will read the 10 sentences above the picture and child will chose the right of 4 pictures, 8) Listening: the teacher will read a paragraph and then he will ask the child 8 questions, 9) Reading of words: in this test there are 10 sentences and the child will chose the right picture for the sentence, 10) Listening: the teacher will read a paragraph and then he will ask the child 9 questions, 11) Understanding reading of words: which consist of paragraph read it very carefully and have to answer 9 questions.

English Language

For second to 9th class, it consists of 4 tests with total number of 80 questions containing 179 units. It includes 1) Listening and Linguistic wealth in which the child will listen to his teacher naming in English a word which is correct for one of the 4 pictures, for 51 words; 2) Reading in which the child will read correctly 75 words, 3) Dictation, 4) Reading 20 words, 5) Reading 20 words; 6) Reading in which the child will chose the right picture. It consists of 17 questions, 7) Listening, and 8) Reading.

Mathematics

For the second grade, it consists of 7 tests with total number of 87 questions containing 153 units. Questions included the following subscales: 1 and 2) Numbers; 3) Exercises including basic additions and subtractions; 4) Arithmetic questions; 5) Figures; 6) Triangles; and 7) Sentences and pictures.

For the third grade, it consists of 7 tests with total number of 107 questions containing 172 units. Questions included the following: 1 and 2) Numbers; 3) Exercises including basic additions and subtractions; 4) Arithmetic questions; 5) Figures; 6) Triangles; and 7) Sentences and pictures.

While, for the fourth to 9th grade, it consists of 8 tests with total number of 122 questions containing 209 units. Questions included the following: 1 and 2) Numbers, 3) Exercises including basic additions, subtractions, and multiply; 4) Exercises, 5) Figures; 6) Arithmetic questions 7) Triangles, and 8) Sentences and pictures.

Intelligent quotient (IQ)

Second grade

1st part

1. Draw the Understandable test- 15 questions.
2. Arithmetic questions test- 15 questions.
3. Maze test- 15 Mazes.

2nd part

1. Vocabulary tests -30 questions.
2. General information test- 24 questions.
3. Words in pictures test - The test contains 30 pictures that the child is asked to name the correct one.

3rd grade

1. Draw the Understandable test 15 questions- pictures with five words.
2. Arithmetic questions test- 15 questions.
3. Maze test- 15 Mazes.

4th grade -A form

1. General information test-24 questions.
2. Vocabulary tests -30 questions.
3. Arithmetic consequences test -30 questions.
4. Domino test-30 questions.
5. Cubic's test- 30 questions.

4th grade -B form

1. Vocabulary tests -30 questions.
2. Arithmetic questions test- 30 questions.
3. Logical pictures test-30 questions.
4. Words in pictures test -30 questions.

5th grade -A form

1. General information test- 18 questions.
2. Arithmetic consequences test- 18 questions.
3. Domino test- 30 questions- 18 questions.
4. Cubic's test- 18 questions.

5th grade -B form

1. Vocabulary wealth- 30 questions.
2. Arithmetic questions test- 15 questions.
3. Fill the logical picture-15 questions.
4. Words in pictures test -30 questions.

6th grade -A form

1. General information test-30 questions.
2. Arithmetic consequences test -30 questions.
3. Domino test-30 questions.
4. Cubic's test-30 questions.

6th grade -B form

1. Vocabulary wealth- 30 questions.
2. Arithmetic questions test- 30 questions.
3. Fill the logical picture-30 questions.
4. Words in pictures test -30 questions.

7th grade -A form

1. General information test-30 questions.
2. Arithmetic consequences test -30 questions.
3. Domino test-30 questions.
4. Cubic's test-30 questions.

7th grade -B form

1. General information test-30 questions.
2. Fill the logical picture-30 questions.
3. Arithmetic consequences test -30 questions.

8th grade -A form

1. General information test- 30 questions.
2. Arithmetic consequences test - 30 questions.
3. Domino test- 30 questions.
4. Cubic's test- 30 questions.

8th grade-B form

1. General information test-30 questions.
2. Fill the logical picture-30 questions.
3. Arithmetic consequences test-30 questions.

9th grade-A form

1. General information test- 30 questions.
2. Arithmetic consequences test - 30 questions.
3. Domino test- 30 questions.
4. Cubic's test- 30 questions.

9th grade-B form

1. General information test- 30 questions.
2. Fill the logical picture- 30 questions.
3. Arithmetic consequences test - 30 questions.

Procedure

Each field researcher, both in the West Bank and Gaza Strip was equipped with instruction manual explaining the use of each screening battery (Arabic, English, Mathematics and IQ) for the second to ninth grades. They were trained for 5 days how to use the instruments and ways of using the manual accompanied each domain.

It is important to note here that the four batteries were used to test every student of the 540 students and this required a lot of effort and time from the field researchers.

Many field researchers encountered lots of problems and difficulties trying to reach students in their respected schools. This was due to the difficulties encountered as a result of the current situation of roadblocks, checkpoints and in some instances curfews and closure imposed on the Palestinian areas.

It is worth noting here that all schools, including the directorate of education in the respected areas, head-teachers, teachers and students cooperated and participated well in this vital project. Their in-put and assistance were extremely essential.

Regular meetings were held during data collection period of the pilot phase between the project staff and the field researchers in the two geo-cultural sectors of the West Bank and Gaza Strip in order to follow-up on the progress of the work and help solving any problems that might arise during this phase of the project.

Regular meetings continued to take place between senior research staff, field coordinators and field researchers in the two geo-cultural sectors of the West Bank and Gaza Strip. Meetings also held between research staff member from the geo-cultural sector of the Gaza Strip and the Department of Education in UNRWA to plan for the pilot phase of the project and for the actual research work. Similar meetings were also held between people from the two geo-cultural sectors of the West Bank and Gaza Strip and people from the Palestinian Ministry of Education to plan for all phases of the research work of the project. The two teams, the West Bank and Gaza Strip continued to meet and discuss the project on regular basis. Data collection phase of the project for both teams started in September 2004. Moreover, both teams discussed, among other things, the possibility of participating in future conferences in learning disabilities.

Statistical analysis of the pilot study

We used SPSS ver. 14 to enter and analyze the data. Pearson correlation test was conducted in which each item was entered for correlation with the total number of questions. Items with less than 0.05 were removed from the instruments for the next study (Arabic, English, Mathematics and IQ Test). The efficiency of each paragraph of the instrument (Discrimination Power) was done by comparing the mean of lower and higher level scores (we identify the highest and lowest values as 27% of the scale on the basis of the total score). The test was done using T independent test. All values were considered as statistically significant at the level of $p = 0.01$.

RESULTS OF THE PILOT STUDY

Instruments validity

According to American Psychology Association, validity was done in this study by Using the following method:

Content validity:

This was done by sending the final version of the instruments to 5 experts who had ranged the validity of the content of the instruments between (83 - 100%).

Convergent validity:

This was done by comparing the academic achievement of students with the indicators of learning difficulties. So, we calculated differences in learning difficulties between students with the low school achievement using their grades in the last semester and high school achievement students using T independent and the differences were statistically significant between the low and high school achievement.

Standard error of measurement and 95% confidence interval

An estimate of error in an assessment is usually given by the standard error of measurement (SEM), and the 95% confidence interval. SEM is the theoretical SD of test scores that would be expected to occur if the tests were repeatedly given to the same client or if different combinations of possible test items were used. The 95% confidence interval is the interval around the measured of reading abilities in the four instruments in which there is a 95% probability that the true test falls. It is calculated by multiplying SEM by 1.96 and then adding and subtracting the resulting figure from the obtained tests score to get the upper and lower limits of the interval. Standard of error ranged from (2.51-3.79) independent.

Item Analysis

The efficiency of each paragraph of the instrument (Discrimination Power) was done by comparing the mean of lower and higher level scores (we identify the highest and lowest values as 27% on the basis of the total score). The test was done using T independent test. All values were considered as statistically significant at the level of $p = 0.01$.

Standardization of the study norms

To find out the extent of the students' learning difficulties in Palestinians students we used quarters in row data in children from second to Ninth grades as follow:

25% High- mean learning difficulties.
25% Low- mean normal without learning difficulties.
75% Only educational problems.

Second study

The aim of this study was to estimate the prevalence of learning disabilities in Arabic and English language, mathematics in Palestinian children in second, third, and fourth grades in West Bank and Gaza Strip.

Method

Subjects

A sample of 1283 pupils from the second, third, and fourth grade were randomly selected. Six hundred and sixty seven were boys which represented (53.79%) and 573 were girls which represented (46.21%). Age ranged from 7-12 years with mean age 8.55 (SD = 1.1).

Instruments

The data was collected from children by using the following questionnaires:

Demographic questionnaire

Demographic information about the participants was obtained using a survey developed by the authors. This questionnaire includes sex, age, and place of residence.

Learning disability screening instrument

Al Quds University group developed group learning disability screening tests. These would identify learning problems in three academic domains (reading and writing in Arabic and English as a second language and Mathematics) and IQ. These tests had been standardized by the pilot study and were used by teachers to test a student in a single class sitting. According to the scientific literature, by using these tests teachers will identify a large proportion of children and youth (from 25%-30% of all school children) who achieve poorly in school.

Learning disability screening instruments

The instruments include the four tested achievement in Arabic Language, English Language, Mathematics, and Intelligent quotient (IQ) after validation and testing reliably done in the pilot study.

Procedure of the second study

In order to select the random sample representative of the Palestinian students from second to fourth grade. We contacted the Palestinian Central of Bureau representative and had several meetings with the statistician. At the end we had put the main variables for choosing the random sample from West Bank and Gaza Strip which include children age from 7-9 years, gender , type of residence (village, camp, city), place of residence (North West Bank, Middle area, South area, Jerusalem, north Gaza and West Gaza), and school type.

We held a meeting and conducted training for 6 hours to 50 teachers in Ministry of education in West Bank and Gaza Strip. We explained to them the aim of the study and give them prepared list of number of children to be interviewed. A cover letter was given to each parent to obtain written permission from them to interview their children in the study. Sociodemographic information for the study population was collected from children. Each interview took 120 min. We held a meeting and conducted training for 6 hours to 50 teachers in Ministry of education in West Bank and Gaza Strip. We explained to them the aim of the study and give them prepared list of number of children to be interviewed. A cover letter was given to each parent to obtain written permission from them to interview their children in the study.

Sociodemographic information for the study population was collected from children. Each interview took 120 minutes to be completed. Children were informed by data collectors that there was no right or wrong answers and that they were free to withdraw from the study at any time. Children were also informed that if they had questions when completing the scales. Children were informed by data collectors that there was no right or wrong answers and that they were free to withdraw from the study at any time. Children were also informed that if they had questions when completing the scales.

Statistical analysis

We used SPSS ver. 14 to enter and analyze the data. Following the correlation coefficient test, both teams intend to carry out the norming study and then to begin the coding and analysis of the data towards the construction of national norms and of the final versions of these instruments. Frequencies and percentages, item difficulty item discrimination were calculated. Chi square test was conducted to find the differences between the two sites and between categories. The p value is considered significant if $p = < 0.05$.

RESULTS OF THE SECOND STUDY

In this paper we will present the data concerning the second to fourth grades while results of the other grades (fifth to ninth grades) will be presented in another paper.

Sociodemographic characteristics of the second study sample

The sample consisted of 1283 students selected randomly from second, third, and fourth grades in West Bank and Gaza Strip. Six hundred and ninety two were boys which represented (53.90%) and 591 were girls which represented (46.10%). Age ranged from 7-9 years with mean age 7.96 (SD = 0.28).

According to class, 36.2% children were in second class. 31.3% were in third class, and 32.5% were in the fourth class.

According to place of residence, 62.4% were from West Bank and 37.6% were living in Gaza Strip.

According to type of school, 63.8% were enrolled in governmental schools, 25.3% enrolled in UNRWA schools, and 10.9% enrolled in private schools. The mean family monthly income was 1755 NIS (SD = 1391). Mean number of households was 7.60 (SD = 2.51).
According to parental education, 4.6% were not educated; 38.6% of the fathers finished less than secondary education, 29.9% had secondary certificate, 9% diploma, had 14.6% had university degree, and 3.3% had higher than university degree. While, 5.9 were not educated 42.87% of mothers finished less than secondary education, 7.3% had diploma degree, 32.8% finished secondary education, and 10.1% finished university education and 1.2% had more than university education.

Means and standard deviations of student grads in Arabic, English, and Mathematics according to school record

From the records of the students in school, the general grade of the students was 75.8 (SD = 31.9), Arabic language as first language mean was 78.3 (SD = 16.6), mean English as the second language was 76.9 (SD = 16.5), and mean Mathematics was 84.4 (SD = 16.1)

Prevalence of learning disability in students at 2-4 class (N = 1283)

The results showed that 64.1% of students scored normal in Arabic Language, 7.7% reported learning difficulties, and 28.2% reported learning disability. The results showed that 62% of students scored normal in English Language, 7.4% reported learning difficulties, and 26.4% reported learning disability. For mathematics, 58.5% of children were normal, 19.2% of children reported mathematics learning difficulties, and 22.3% reported mathematics learning disability.

In order to find the differences between West Bank and Gaza Strip in leaning problems in Arabic, English Language, and Mathematics, Chi square test was performed. The results showed that 10.6% of children in West Bank reported learning difficulties in Arabic compared to 4.3% in Gaza Strip and 27.5% of children in West Bank reported learning disability compared to 29.1%. There were no statistically significant differences in Arabic Language scores between the two sites of the study.

The results showed that 6.5% of children in West Bank reported learning difficulties in English compared to 9.2% in Gaza Strip and 26.6% of children in West Bank reported learning disability compared to 25.2%. There were no statistically significant differences in English Language scores between the two sites of the study.

The results showed that 17.1% of children in West Bank reported learning difficulties in Arabic compared to 23.4% in Gaza Strip and 16.2% of children in West Bank reported learning disability compared to 31.9%. There were statistically significant differences in Mathematics scores between the two sites of the study toward children from Gaza Strip who reported more learning difficulties and disabilities than children of West Bank (χ^2 =18.6, df = 1, $p < 0.001$).

Learning problems according to type of schools

In order to find the differences between types of schools (Governmental, UNRWA, and private schools) chi square test was done. The results showed that 6.3% of children from governmental schools reported learning difficulties , in Arabic language 1.6% students from UNRWA schools reported difficulties, and non in the privates schools reported learning difficulties. For learning disabilities, 16.1% of students from governmental schools reported disabilities, 9.1% in UNRWA schools reported disability, and 3.1% of students from private schools reported disability. There were statistically significant differences in difficulties and disabilities in Arabic Language toward children enrolled in governmental schools more than those in UNRWA or private schools (χ^2= 12.02, df = 4, $p < 0.017$).
For English language as the second language in Palestinian schools, 5.94% of children enrolled in government schools reported learning difficulties, 1.40% in UNRWA schools reported difficulties, and 0.35% in private schools reported difficulties. It was obvious that children enrolled in government schools reported disabilities in English language (68.8%) compared to 20.63% in children enrolled in UNRWA, and 10.49% enrolled in private schools. There were no statistically significant differences in difficulties and English language disabilities according to types of schools.
(χ^2= 12.02, df = 4, $p < 0.01$).
In order to find the sex differences in learning problems, chi square test was done. The results showed that 4.63% of boys had learning difficulties in Arabic language

compared to 3.09% of girls. While, 15.06% of boys reported learning disabilities compared to 13.13% of girls, 5.02% of boys reported learning difficulties compared to 2.86% of girls. For Mathematics, 11.11% of boys reported learning difficulties and 8.40% of girls reported such difficulties. While 13.28% of boys reported learning disabilities and 8.94% of girls reported disabilities. No statistical differences between boys and girls in Arabic and English language, and Mathematics.

In order to find the differences in prevalence of learning problems according to class of children, chi square test was conducted. The results showed that 3.22% of children in the second class had learning difficulties in Arabic language compared to 1.93% and 2.25% in the third and fourth class. For learning disabilities, 9% of students in the second class reported disabilities compared to 7.72% and 9.65% in the third and fourth class. No significant differences between the three classes in Arabic language learning problems.

For English language, 3.22% of students in the second class reported leaning difficulties compared to 1.93% and 2.25% in third and fourth class. However, 9% of students in the second class reported learning disabilities compared to 7.72% and 9.65% in the third and fourth class. No significant differences between the three classes in English language learning problems.

For Mathematics, 3.67% of students in the second class reported learning difficulties compared to 9.97% and 5.51% in children in the third and fourth class. For learning disabilities, 4.72% of students in the second class reported disabilities compared to 10.76% and 6.82% in the third and fourth class. There were significant differences between the three classes in Mathematics learning disabilities in which children in third class reported more disabilities than the second and forth class ($\chi^2 = 16.36$, $p < 0.003$).

Relationship between school records scores of subjects and total scores of student's subjects

In order to find the relationship between the scores of children according to schools records in the three subjects and total scores of subjects tested by children themselves, correlation Coefficient test using Pearson correlation test was done. The results showed that total scores of Arabic language from schools records was statistically significant positively correlated with total scores of Arabic Language reported by children ($r = 0.13$, $p = 0.001$) and also, there was statistically significant positive correlation between total scores of mathematics from school records and total mathematics scores tested by children themselves ($r = 0.13$, $p = 0.001$), while there was no correlation between total scores of English language from school records and total scores of English Language tested by children .

Relationship between total scores of student's subjects and IQ tests

In order to find the relationship between the total scores of subjects and IQ tests and other achievement in Arabic, English, and Mathematics tested by children themselves, correlation coefficient test using Pearson correlation test was done. The results showed that total scores of Arabic language was not correlated with total scores of IQ (first and second part) ($r = 0.003$, p = ns), there was no correlation between total scores of English Language tested by children and IQ tests, and there was no correlation between total scores of mathematics tested by children themselves and IQ tests .

DISCUSSION

This study is the first study carried out in the area trying to standardize culturally accepted instruments for detecting children with learning difficulties and disabilities. The first objective of the study was achieved in which we had now instruments which can help the teachers and educators in detecting children who have difficulties in continuing their education due to learning problems even they are mentally within the normal range of other children in the same age and sex. These instruments are the first set of Arabic language of batteries available in the Arab world and could be used in other Arab countries. In recent years, the most common techniques of identifying reading disability have been discrepancy methods and low achievement method. Traditionally, the identification of reading disabilities has been the domain ofthe special education process, with an discrepancy between ability, usually defined as intelligence (IQ), and achievement, as measured by standardized, norm-referenced tests (Aaron, 1995). The frequency of use of discrepancy methods in the literature to date, however, far exceeds other methods of learning disability identification. The controversy surrounding the definition of learning disability, not surprisingly, has implications for the way learning disability is actually measured. Indeed, the variations in methods used for the identification of children with learning disabilities have long been a topic of debate. Our study showed that there were discrepancy between the cognitive functions of the children tested by IQ tests and other achievement in Arabic, English, and Mathematics. This is consistent with meta-analysis of previous studies of Fuchs et al., (2000) which concluded that IQ-discrepancy criteria were valid, whereas our study was inconsistent with Hoskynand Swanson (2000) meta-analysis of previous studies which concluded that their validity was weak. These contradictory conclusions reflected differences in research questions and sampling procedures that preclude a resolution of the validity of differentiating IQ-discrepant and IQ-consistent poor readers. Because of

the variance among and within methods then, identifying which method of reading disability identification is the most appropriate or accurate should be approached with caution (Limbrick et al., 2008).

Prevalence of learning disability

In our study we used the percentile of 25th as the cut-off points for low and high achievements. Even, there is no clear consensus about which percentile should be used as the cut-off point. Thus, different percentiles (from 10th or 16th to 25th or even 30th) were used in different studies, leading to inconsistent results and consequently very different prevalence rates of learning disability (Fuchs et al., 2003). An alternative process focusing on the resistance of at-risk children to high quality intervention has been recommended as more helpful for identifying children who need special support in the acquisition of skills in reading, written expression and mathematics. This approach, called "response to intervention" (RTI), relies on ipsative rather than normative assessment of academic performance (Fletcher et al., 2006).

The results showed that 28.2% of children reported learning disability in Arabic Language, 19.2% reported learning difficulties in English language, and 22.3% reported learning disability in Mathematics. There were no statistically significant differences in Arabic, English language scores between the two sites of the study. Learning difficulties and disabilities in Mathematics scores were more in children from Gaza Strip who reported more than children of West Bank.

There were statistically significant differences in difficulties and disabilities in Arabic Language toward children enrolled in governmental schools more than those in UNRWA or private schools. Our study results were consistent with Australian studies, in study of Rohl et al. (2000) of children who examined the prevalence national survey of schools (n = 377) where 65% of respondents (i.e., teachers, principals) estimated that between 10 and 30% of students experienced learning difficulties. This was consistent with the findings of Bartak and Fry (2004), who asked a group of 60 Victorian primary and secondary teachers to describe students with special needs in their classrooms. Teachers reported that 10% of the total number of students (n = 1505) were identified as experiencing learning difficulties.

Also, our results consistent with Jimenez & de la Cadena (2007) study the prevalence of learning disabilities in Guatemala and Spain school children, in the interviews with Guatemalan teachers 178 children were identified with reading and spelling disabilities. This represents 32% of the total sample of 557 students. Eleven percent was identified with reading disabilities, 9% with spelling disabilities, and 12% with reading and spelling disabilities. In the Spanish sample, 291 students (i.e., 28 %) of the 1,408 children were identified with LD in reading and spelling. Spanish teachers reported that 6% of the children showed reading disabilities, 8 % spelling disabilities, and 14 % both. Moreover, it is inconsistent with study of Altarac (2007) which aimed to study the prevalence of learning disability in US children, the results showed higher rates if learning disability in US children under the age 18 with asthma and diabetes compared to those without. Among children without asthma it was 9.0% compared with 14.4% among children with asthma. Similarly, prevalence of learning disability among children without diabetes was 9.7%, compared with 18.3% among children with diabetes. Also, our results were much higher that found that learning disability was diagnosed in approximately 6% of all school-age children (Shapiro, 1996). Mayes & Calhoun (2007) in study of clinical sample (n = 485), 317 of the children (65 percent) had LD in reading, Mathematics or written expression. Among children with a learning disability, the most frequent LD type was written expression alone (50 percent), which was significantly more prevalent than any of the other six LD types alone or in combination with each other. Percentages of children with LD in written expression in combination with reading and/or Mathematics ranged from 13 % to 15 %, with a non-significant difference between these frequencies. The percentage of children with LD in reading alone was 4 %, as was the percentage of children with LD in Mathematics alone. LD in reading alone and LD in Mathematics alone were significantly less common than all other LD combinations, except for LD in reading and Mathematics together without LD in written expression. Only one child had LD in reading and Mathematics and not written expression. This combination was significantly less frequent than any other LD combination

Recommendations

In conclusion, we had developed and validated for students in Palestine instruments which could help teachers and special educators in early detection of students with learning disability. The results of the study reveal that a considerable percentage of the Palestinian children have leaning disability with standardized instrument validated in Arabic Culture.

These findings highlight the needs for the following:

- The education system in Palestine should identify children with LD and refer them for diagnosis as early as possible. Such diagnosis would assist in providing appropriate support in school.
- Intensive support should be provided to students with LD, particularly in the late elementary school and early secondary school years, when they are most likely to drop out.

- The Education Services should administer the screening assessment process to identify children with LD. In addition, it should provide education programs designed to meet the needs and characteristics of children with LD, as well as intensive training and professional cooperation with children (psychologists, special educators, etc.) on working with children who have learning disability.

- Further research is required to evaluate the validity of its evaluative properties, as well as to assess its performance among other Arab countries.

- It is important that the psychometric properties of these screening instruments be re-evaluated in an independent sample. Further psychometric testing should also evaluate the responsiveness of these instruments.

- More instruction-related categories of LDs could be advanced by the implementation of the RTI approach, which is explicitly designed to include instructional aspects in the definition of LDs.

- As is common with new measures, further research is needed to confirm its psychometric properties and to determine its appropriateness as learning disability measures. These instruments are new and promising measures for use in Screening and evaluation of LD among Palestinian children.

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Table 1: Sample of the pilot study

Grade	West Bank	Gaza Strip	Total
Second	20	10	30
Third	20	8	28
Forth	19	8	27
Fifth	19	8	27
Sixth	17	8	25
Seventh	17	8	25
Eight	17	8	25
Ninth	18	8	26
Total	**148**	**66**	**213**

Table 2: Sociodemographic characteristics of the study sample (N = 1283)

	N	%
Gender		
Male	692	53.9
Female	591	46.1
Total	1283	
Class		
Second	464	36.2
Third	402	31.3
Fourth	417	32.5
Place		
West Bank	801	62.4
Gaza Strip	482	37.6
Types of school		
Governmental	816	63.8
UNRWA	323	25.3
Private	140	10.9
Paternal education		
Not educated	59	4.6
Less than secondary	494	38.6
Secondary	383	29.9
Diploma	115	9.0
University	187	14.6
Post graduate	42	3.3
Maternal education		
Not educated	76	5.9
Less than secondary	548	42.8
Secondary	420	32.8
Diploma	93	7.3
University	129	10.1
Post graduate	15	1.2

Table 3. Means and standard deviations of the student's subjects according to school records

Subjects	Mean	SD
Arabic	78.3	16.6
English	76.9	16.5
Mathematics	78.4	16.1
General	75.8	31.9

The results of the study showed that mean Arabic Language scores was 148.7 (SD = 64.5), mean English Language scores was 66 (SD = 10.8), and mean Mathematics scores was 41.9 (SD = 7.9).

Table 4. Means and standard deviations of the student's subjects according to study sample

Subjects	Mean	SD
Arabic	148.7	64.5
English	66.0	10.8
Mathematics	41.9	7.9

Table 5. Prevalence of learning disability in students at 2-4 grades (N = 1283)

Subjects	Normal	Learning difficulties	Learning disability
Arabic	64.1	7.7	28.2
English	66.2	7.4	26.4
Mathematics	58.5	19.2	22.3

Table 6. Differences in leaning problems between West Bank and Gaza Strip

	West Bank	Gaza Strip	Total	χ^2	P
Rate of Arabic					
Normal	62.0	66.7	64.1	3.5	0.16
Learning difficulties	10.6	4.3	7.7		
Learning Disability	27.5	29.1	28.2		
Rate of English				0.75	0.68
Normal	66.9	65.6	66.3		
Learning difficulties	6.5	9.2	7.7		
Learning Disability	26.6	25.2	26.0		
Rate of Mathematics				18.6	**0.001
Normal	66.7	44.7	58.3		
Learning difficulties	17.1	23.4	19.5		
Learning Disability	16.2	31.9	22.2		

Table 7. Differences in learning problems according to type of school

	Type of schools					
	Government	**UNRWA**	**Private**	**Total**	χ^2	**p**
Level of Arabic Language						
Normal	47.6	14.2	2.0	63.8	12.02	**0.01
Learning difficulties	6.3	1.6	0.0	7.9		
Learning disabilities	16.1	9.1	3.1	28.3		
Level of English language						
Normal	45.10	14.34	6.29	65.73	2.67	0.61
Learning difficulties	5.94	1.40	0.35	7.69		
Learning disabilities	68.88	20.63	10.49	100.00		
Level of Mathematics						
Normal	35.38	17.55	4.74	57.66	4.2	0.36
Learning difficulties	12.53	5.29	2.23	20.06		
Learning disabilities	16.16	5.01	1.11	22.28		

Table 8. Sex differences in learning problems

	Male	**Female**	**Total**	χ^2	**p**
	Level of Arabic Language				
Normal	40.15	23.94	64.09	1.80	0.41
Learning difficulties	4.63	3.09	7.72		
Learning disabilities	15.06	13.13	28.19		
	Level of English language				
Normal	39.13	27.09	66.22	2.54	0.28
Learning difficulties	5.02	2.68	7.69		
Learning disabilities	13.04	13.04	26.09		
	Level of Mathematics				
Normal	30.89	27.37	58.27	1.19	0.55
Learning difficulties	11.11	8.40	19.51		
Learning disabilities	13.28	8.94	22.22		

Table 9. Percentage of learning problems from total sample

	Second class	Third class	Forth class	Total	$\chi 2$	p
Level of Arabic Language						
Normal	21.22	21.86	23.15	66.24	0.80	0.94
Learning difficulties	3.22	1.93	2.25	7.40		
Learning disabilities	9.00	7.72	9.65	26.37		
Level of English language						
Normal	21.22	21.86	23.15	66.24	1.51	0.82
Learning difficulties	3.22	1.93	2.25	7.40		
Learning disabilities	9.00	7.72	9.65	26.37		
Level of Mathematics						
Normal	22.05	19.16	17.32	58.53	16.36	0.003
Learning difficulties	3.67	9.97	5.51	19.16		
Learning disabilities	4.72	10.76	6.82	22.31		

Table 10. Pearson Correlation Coefficient test

School records subjects scores Total scores of subjects	Arabic Language	English Language	Mathematics
Total scores of Arabic language	**0.13	**0.11	**0.11
Total scores of English Language	**0.10	0.07	*0.08
Total scores of Mathematics	**0.14	**0.13	**0.15

** p<0.01 *p<0.05 p<0.05

Table 11. Pearson Correlation Coefficient test

Level of subjects IQ	Arabic Language	English Language	Mathematics
Arabic language			
IQ first part	0.003	0.009	0.02
IQ second part	0.01	-0.01	0.01
English language			
IQ first part	0.03	0.05	0.05
IQ second part	0.06	0.04	0.05
Mathematics			
IQ first part	-0.02	-0.02	-0.04
IQ second part	0.02	0.006	0.05