

Evaluation of Hearing Impaired Students' Reading Problems and their Relationship with Some Variables in the Kingdom of Saudi Arabia

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Abstract: The study aimed to assess the reading problems of hearing-impaired students in Saudi Arabia, by selecting four skills of reading; the vocabulary, fluency, auditory and visual discrimination and comprehension and their relation with some variables, such as gender and type of hearing disability. A test of reading skills for the hearing impaired was prepared, the study sample consisted of 120 students, 30 deaf boy, 30 deaf girl, 30 hard of hearing boy and 30 hard of hearing girl. The results showed the existence of problems in auditory and visual discrimination, fluency and comprehension. Less problems were in vocabulary for the whole group of deaf and hearing-impaired. The results indicated the influence of hearing loss degree on the acquisition of language and auditory discrimination. The more the degree of hearing loss, the more the degree of problems in reading skills. The findings also showed that females are better than boys in reading skills valuable of both the deaf and hearing impaired. The results indicated the existence of significant differences between the deaf and hard of hearing in all axes of reading skills test for the hearing impaired for the benefit of hard of hearing, which use the methods of total communication and letters pronunciation and they were better in reading skills than deaf who use sign language.

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1. Introduction:

Hearing disability is one of the special education categories, which affect negatively on the growth of different manifestations of disabled including the growth of emotional, social and cognitive abilities and academic achievement. This negative impact of the hearing disability is clear mostly in speech and language development. As a result, hearing disability is described as language disorder, the deaf person is described as a dumb because the sense of hearing is the main entrance to learn speech and language, in other words, we learn to speak only after hearing the speech. The educational environment and the environment around us that we interact with also described as an audio environment. Thus, the hearing loss limits and reduces the amount of required expertise for the development of knowledge and language (Smith, 2007; Bess & Humes, 2008; DeBonis & Donohue, 2008; Martin & Clark, 2009). Hearing Impairment is identified as hearing loss range between simple and very severe, it affects negatively on educational performance, and in this general framework individuals with hearing disabilities are classified to Hard of Hearing and Deaf. There are two perspectives in the definition of each of the deaf and hard of hearing, the Physiological perspective and the educational perspective. Physiological 'perspective sees that hearing impaired is a person who suffers from hearing loss ranges between 15 dB to 69 dB, and he can use hearing with the hearing aids functionally,

but the deaf is identified as a person who has hearing loss range from 70 dB and above, and cannot use hearing with or without the hearing aids functionally (Northern & Downs, 2002). The educational perspective sees that hearing impaired is a person who owns the remains of hearing and can use hearing aids to address successfully linguistic information acoustically, while the deaf is identified as a person who has hearing loss prevent him from the successful treatment of the language information through hearing whether hearing aids are Used or not used (Moores, 2001; Hallahan et al., 2006; Stach, 2009).

The development of speech and language for students with hearing impaired is influenced by age variable at infection, and hearing disabilities are classified to deafness Prelingually deafness and Postlingually deafness. In the Prelingually deafness, deaf individual is someone who was born with a hearing loss or someone whose hearing loss occurred before he began to speak and before language acquisition and development, therefore his disability affects negatively on oral communication with others and on learning basic academic skills. These students depend on the visual area in communication and learning, but the students who lose their hearing after language acquisition and development, can take advantage of their language abilities and verbal communication with others orally. The age that separates Prelingually deafness and Postlingually deafness is 18 months (Smith, Rousan, 2010).

Some see that the educational significance of hearing loss starts from rate of 35 dB, and the Educational effect varies depending on the severity of the disorder. Students with hearing loss of 35 dB to 54 dB lose most of the sounds needed for verbal conversation, and show weakness in attention, language delays, some problems in learning the meanings of words and grammar and difficulties in hearing some of the words (Northern & Downs, 2002) and such Students need special assistance in hearing and learning to speak (Moore, 2001). As for students with hearing loss of 55 dB to 69 dB do not develop speech and language automatically, and have difficulty in hearing sounds and distinguishing between them, as well as they have problems of language. Students in this category, require a special class or special school (Moore, 2001).

While students with hearing loss of 70 dB to 89 dB have Linguistic and verbal problems and very severe learning difficulties, and they hear only loud sounds (Northern & Downs, 2002) students here need a special class or special school and require special assistance in hearing, speech, language and the academic side (Moore, 2001) finally the students with hearing loss of 90 dB and above are described as unable to hear sounds, and depend in learning on sight more than hearing (Northern & Downs, 2002) students here require a special class or special school and need special aural-verbal, linguistic and educational assistance (Moore, 2001).

Because reading is described as verbal- aural behavior, the hearing impairment affects negatively on it. If people with Hearing Impairment do not be provided with the appropriate rules of good language in educational environments, they will not develop their language, reading and writing skills. Thus reading has attracted attention of researchers and teachers as it is an important factor for success at school (Kirk, et al., 2003).

Characteristics of reading among students with hearing impaired:

Reading is described as an interactive process between the reader and the written text, and in this interactive process, reader uses prior knowledge and skills possessed to read and understand all the text and reading behavior of deaf students, associated with degree of hearing loss and clarity of speech (Paul, 2001). Students with hearing impairment lack spoken vocabulary, and this perhaps explains the problems of reading comprehension and the low level of fluency in their reading (Marschark & Wauters, 2008).

Students with disabilities acoustically distinct lack of vocabulary spoken, and this perhaps explains the problems of reading comprehension and the low level of fluency in their reading (Marschark & Wauters, 2008) and also suffer from a lack of

knowledge of the rules of the language, and this is what makes the reading they have slow. (Vernon & Andrews, 1990)

In addition, audio codec of students with hearing impairment is slow compared to their peers listeners. And prior knowledge affect the growth of vocabulary in reading behavior and development, and that this knowledge is also associated with giving meaning Language, and this explains some of the difficulties experienced by the deaf to understand the meaning of the language. (Marschark et al., 2002).

Students with hearing impairment have problems in phonological awareness, and understanding vocabulary compared to children with normal hearing (Briscoe et al., 2001; Trezek & Wang, 2006).

Generally, reading behavior of students with hearing impairment is characterized with two essential characteristics: first, most of the students with hearing impairment cannot reach the same achievement as their hearing peers. Reading of deaf student in 19 years old is equal to students in the average age of 8 years. Secondly, growth rate of reading achievement is 0.3 grade level in the year, while it is 1.0 for hearing students (Paul, 2003)

Successful reading of hearing impaired students needs some skills such as: word recognition, comprehension and pronunciation. For Example, the analysis of the visible symbols of words is one of the important processes that achieve total words recognition, as well as reading comprehension requires experience. Thus, the programs teach reading to students with hearing impairment should focus on ideas drawn from the reading text and use reading as an activity and taking into account the developmental level of the students and their interests (Marschark & Wauters, 2008).

Reading skills of students with hearing impairment are being assessed through the use of standardized tests, however, the use of these tests does not give us detailed information about the nature of literacy difficulties, whether caused by weakness in the prior knowledge, or the result of the inability of Audio Decoder. Hence, the assessment of descriptive and functional reading based on an appropriate approach for the purposes of classroom instruction. (Marschark et al., 2002).

Importance of the study:

Students with hearing impairment study in special schools, and because of the limited numbers accepted by these schools, many students with hearing impairment remain on waiting lists to attend these schools, so the ages of these students may be older than students in the regular classes. Students with hearing impairment study the same curriculum that their hearing counterpart study in regular schools. They communicate with by sign language, and most

of the teachers who work with these students coming from the regular mainstream schools. Due to privacy of hearing disabilities and their effects, these students need special modifications so that they can carry out their duties of education. These adjustments take place only in the light of the evaluation. The reading skill is one of the necessary skills to succeed in school, and also reading skills assessment it helps the teacher to determine of his students capabilities of literacy and has indicated. (Moore, 2001; McLoughlin & Lewis, 2008) Several studies indicated that hearing impaired students suffer from difficulties in reading (Jackson et al., 1997; Dyer et al., 2003; Gibbs, 2004; Gilbertson & Ferre, 2008). Therefore, the present study tries to determine the nature and content of these difficulties in the context of education system. The evaluation of the performance level of literacy skills and providing appropriate tools for this purpose helps workers and professionals in the field of education of hearing impaired students on several things, including:

1-Determining the level of their students' performance in reading skills.

2 - Identifying the strengths and weaknesses in their reading so that this knowledge will help in the development of plans and appropriate remedial programs for reading.

3 - Identifying ways to teach reading skills for students who weak in these skills.

4 - Controlling tutorial reading and determine the progress of students in it.

5 - Using the developed tool in this study to conduct research and studies linking reading skills and other variables with these students.

Problem and questions of the study:

This study aims to assess the reading skills of students with hearing impairment enrolled in schools in Saudi Arabia. In particular, the current study is trying to answer the following questions:

1. What is The performance level of hearing impaired students in reading skills?

3. Does the level of performance of the hearing-impaired students in reading skills depend on the degree of hearing loss?

4. Does the level of performance of the hearing-impaired students in reading skills differ according to the way they communicate?

Keywords: Hearing Impaired, reading skills, hearing disabilities, special education.

Definition of terms of the study: The terms used in this study include:

Reading skills:

The skills that are used to identify the total words and symbols to understand and analyze the words, as well as to draw conclusions by understanding the ideas In this study. (McLoughlin et al., 2008). But in this study reading skills is defined procedurally in

terms of total grades and sub grades for study tool dimensions that members of the study obtained on a scale reading skills.

Communication method: It is the method used by the students to express their ideas, opinions, feelings and exchange of information (Heward, 2006). And procedurally, the Communication method used by the student to exchange information. Members of the study used two different methods: Total method, which includes the use of hand signals, finger spelling, oral communication. The second method is sign language which includes the use of special signs with clear meaning and can be linked to the words to form sentences.

Hearing loss degree: a term that describes the degree of hearing loss from simple to very severe (Paul, 2007) and procedurally, results of acoumetry documented in the records of students enrolled in schools for hearing impaired according to the following levels:

1-35 -54 dB (Moderate)

2 - 55-69 dB (Moderately severe)

3-70 -89 dB (severe)

4-90 dB and above (very severe)

Hearing impaired: a student who suffers from hearing loss qualifies to receive special education services, and includes the concepts: deaf and hearing impaired (Al-Khatib and Al Hadeedy, 2004) and procedurally in this study is the student who is suffering from hearing loss and enrolled in a special school for hearing handicapped

Deaf: a student who suffers from hearing loss so severe and cannot hear the speech understood by the sense of hearing; whether used or not used sound amplifiers (Smith, 2007) and procedurally in this study, deaf is the student who is suffering of hearing loss of 90 dB and above, and enrolled in a special school for hearing handicapped.

Hard of Hearing: a student who suffers of hearing loss, it becomes difficult to understand speech unless he uses the appropriate audio amplifiers to hear and understand speech (Alzeriqat, 2009). Procedurally in this study, hard of hearing is the student who is suffering from loss of hearing what ranges between 35 to 89 dB, and enrolled in a special school for hearing handicapped.

Medical headset: It is a hearing aid help hearing impaired students in linguistic. (Heward, 2006) and procedurally in this study, it is that tool worn by the student who is suffering from hearing loss ranges between 35 to 89 dB, and Enrolled in a special school for hearing handicapped to be able to hear and address the linguistic information.

Determinants of the study

The current study was conducted in the framework of the following determinants:

- Study tool
- Data collection procedures.
- Variables of the study.
- The study was conducted on the reading skills

of students enrolled in special schools for student with Hearing Impairment, and did not target Hearing impaired students enrolled in regular schools.

Literature review

Because of the scarcity of Arabic studies for assessing reading skills of hearing-impaired, researchers targeted to Foreign Studies, according to chronological order.

s students: The ample consists of three groups of profoundly deaf readers: 100 adolescents from oral school programs, 113 adolescents from total communication programs, and 211 students entering a postsecondary institution that used total communication. The results indicated that a weak correlation reading process affect the reading comprehension among deaf students, and hinder their ability to use the vocabulary.

The study of both Jackson and Paul Smith (Jackson, Paul, & Smith, 1997) which aimed to investigate the effect of prior knowledge on the ability of reading comprehension among a sample of 51 deaf students; ranged in age from 12 to 20 years, and the average loss of hearing is 89 dB. The results indicated a relationship between prior knowledge of words and reading comprehension among deaf students, the study emphasized the need to enrich the experiences of deaf knowledge.

Study (Brisco et al., 2001) aimed to compare language ability, literacy and Phonological skills among students with hearing loss between mild to moderate. The study compared children aged between 5-10 years with mild to moderate hearing impairment and children with specific language disabilities and children without disabilities. The results in general indicate mean scores of children with mild-to-moderate hearing loss were significantly poorer on tests of phonological short-term memory, phonological discrimination, and phonological awareness than children without disabilities. Nearly 50% of the students with hearing loss showed phonological impairment associated with poorer expressive and receptive vocabulary and higher hearing thresholds than remaining children without phonological impairment. Non-word repetition deficits were observed in students with hearing loss. study (Dyer et al., 2003) aimed to identify the characteristics of self-rapid literacy label, and phonological awareness and decoding code, and its relationship to reading in a sample of 49 deaf students in age of 13 year, and the rate of reading achievement equivalent to 7 years. The results indicated the existence of difficulties in the sample study and linked

these difficulties to reading; the study attributed the deaf students' reading difficulties to the existence of problems in phonological awareness and hearing decoding code.

Gibbs's study (Gibbs, 2004) aimed to identify the reading skills among a sample of children with medium and permanent hearing disabilities. The study included 30 disabled children in age of 6 to 10 years. The results Indicated that hearing impaired study sample are suffering from lack of vocabulary and difficulties in hearing discrimination increases with increasing of hearing loss, and also showed difficulties in perceiving function words sounds. Study concluded that there is a relationship between knowledge of language and vocabulary growth of voice recognition and reading.

Trezeck and Wang (Trezeck & Wang 2006) in a study aimed to identify reading difficulties, and the effectiveness of audio reading approach in hear handicapped students acquiring a reading skills, the study results indicated that the study sample suffering from problems in the analysis of the audio reading, and a severe lack of reading comprehension skills. The study also noted that all students' different degrees of hearing disabilities have benefited from the proposed approach in varying degrees.

Moreno and Harris (Harris & Moreno, 2006) studied speech and reading skills of children suffering from very severe hearing disabilities. The study included 18 children between the ages of 7 and 8 years and they have a hearing loss greater than 85 dB and using hearing aids. The results indicated that the children of the study sample showed a remarkable oral errors and difficulties in the use of audio analysis in spelling, while showed good skills in reading speech. Their findings also indicated that students who use total communication have better reading skills than students who use sign language.

Stephanie (Stephanie, 2008) investigated reading difficulties among hearing impaired students in the United States about 9,000 individuals participated in this study, students teachers, administrators, and other individuals involved in the education of this group of students., The findings suggest that students hearing Impairment appeared obvious problems in literacy skills associated with the auditory discrimination and voice analysis and comprehension.

in their study (Gilbertson & Ferre, 2008) which targeted to identify reading difficulties of hearing impaired students, pointed out that these students suffer from obvious problems in the acquisition of language skills in receptive and expressive manifestations, compared with their hearing peers, and the study recommended the need to focus on the output of literacy in the curriculum for teaching reading to students with hearing disabilities.

The previous literature review indicated that hearing impaired students suffer from problems in reading skills, due to the scarcity of Arab Studies in this area has the current study focused on identifying reading difficulties and describing hearing impaired students enrolled in special schools for the deaf.

A study of Alzeriqat (Alzeriqat, 2011), aimed to assess the reading skills of hearing-impaired students, the sample for study consists of 123 of hearing-impaired students enrolled in deaf schools in Jordan, (55) male (67) female. To achieve the objective of the study, the reading skills of the study sample were assessed depending on the reading skills test and the researcher used the t-test and ANOVA test to answer questions of the study. The results indicated that the hearing-impaired students have weak reading skills, the performance of the female vocabulary and comprehension was better than males. The data also indicated that the fourth grade students have fluency skills of perception and phonological awareness better than students of sixth grade. And also the fifth grade students have skills of perception and phonological awareness better than sixth grade students. Students who are suffering of hearing loss 55 dB have better fluency than students who are suffering of hearing loss 69 dB. As the results showed that students who are suffering of hearing loss of 69 dB are better than students with the degree of 90 dB hearing loss and above. As well as the data indicated that students who use total communication have better reading skills than students who use sign language. In addition, the results showed that students who use hearing aids have fluency skills and visual discrimination, perception and phonological awareness better than students who do not use hearing aids. The study recommended the need to focus on the output of literacy in the curriculum for teaching reading to students with hearing.

(Patrick Howse BBC News, 2014) Education reporter said that Britain's deaf children failed in education system. Researchers say that deaf children have reading difficulties as the problems faced by hearing children who suffer from dyslexic. The team found there are no specific interventions offered to deaf children routinely to support reading.

The study was done by a team from City University London, and was funded by the Nuffield Foundation. It compared two groups of children aged 10 to 11. One group consists of deaf children who communicate orally (known as "oral deaf"), and the other hearing children with dyslexia. 79 children with a severe-profound level of deafness took part in the study, representing a significant proportion of oral deaf children in the UK in this age group. As a result of their hearing loss, deaf children have difficulty

hearing the speech that make spoken language on which reading is based.

The team found that the oral deaf children don't take the right support and that with a proper understanding of deaf their reading difficulties and appropriate help, the outcome for deaf children in the UK can be changed the report reveals the extent to which the education system is currently failing to address the needs of deaf children with reading difficulties". The team also indicates that it is possible to identify and address those difficulties at early stages.

The Department for Education indicates that in 2013 more deaf children achieved five good results in subjects including English and math" in England. Last year, 42.7% of deaf children achieved 5 results at A* to C including English and math. This is compared with 37.4% in the previous year and 28.3% in 2007/08.

Welsh government figures indicated that deaf pupils face learning barriers in Wales, and that they 41% less likely to land a higher grade in main subjects. They stop completing their full education. The National Deaf Children's Society (NDCS) said there is an a gap between deaf and their peers at every Key Stage. It is unacceptable that so many deaf pupils fail to reach their full potential because they face barriers in education. The charity said Welsh government figures showed that in 2012, deaf pupils were 41% less than their peers to achieve a higher grade in basic subjects English,, math and science. To close the gap between the deaf and their peers there are some suggestions: Appropriate help of specialist, Good hearing aids in classrooms and teachers and hearing pupils should learn sign language.

Study of (Kelly & Mousley, 2001) indicated that deaf and hearing college students were given 30 mathematics problems to solve. The initial 15 numeric and graphic problems, then 15 word problems, with an increase in problem complexity. The results indicated that the deaf college students, regardless of reading level, were achieving results as their hearing peers in solving numeric and graphic problems and in the initial, least complex set of word problems. But, as the complexity of the descriptive information in the word problems increased, the complexity of the problem, the scores of the deaf students decreased and there is no comparable decrease was observed in the hearing students' scores.

Goldin - Meadow and Mayberry (Goldin - Meadow & Mayberry, 2001) indicated that reading requires two capabilities: familiarity with a language, and understanding the mapping between that language and the printed word (Hoover & Gough, 1990; hamberlain & Mayberry, 2000). Children who are profoundly deaf are disadvantaged on both, So

reading is difficult for profoundly deaf children. But some deaf children succeed to read fluently. recent research suggested that individuals with good signing skills are not worse, and may even be better, readers than individuals with poor signing skills. (Chamberlain & Mayberry, 2000) knowing a language appears to facilitate learning to read. Skill in signing does not guarantee skill in reading—reading must be taught. The next frontier for reading research in deaf education is to understand how deaf readers map their knowledge of sign language onto print, and how instruction can be used to turn signers into readers.

Mayberry and Lieberman (Mayberry et al., 2011) investigated the relation between reading ability and phonological coding and awareness (PCA) skills in individuals who are severely and profoundly deaf using a meta-analysis. There are 230 relevant studies, 57 studies were analyzed that tested experimentally PCA skills in 2,078 deaf participants. Half of the studies found statistically significant evidence for PCA skills and half did not. A subset of 25 studies also tested reading proficiency and showed a wide range of effect sizes. PCA skills predicted 11% of the variance in reading proficiency in the deaf participants. In 7 studies, language ability predicted 35% of the variance in reading proficiency. These results indicate that PCA skills are a low to moderate predictor of reading achievement in deaf individuals and that other factors have a greater influence on reading development such as language ability.

(Guldenoglu et al., 2013) designed this study to examine the letter-processing skills of prelingually deaf and hearing students from five different orthographic backgrounds (Hebrew, Arabic, English, German, and Turkish). The study sample consists of 128 hearing and 133 deaf of 6th–7th graders. They were tested with a paradigm that assessed their ability to process letters under perceptual and conceptual conditions. Results suggest that skills of the letter-processing of deaf readers from some orthographic backgrounds may be underdeveloped in comparison to hearing peers. Such letter-processing difficulties were restricted to readers of some but not all of the tested orthographies warrants the conclusion that prelingual deafness, does not impede the development of effective letter processing.

(Coppens et al., 2013) developed a structural model of reading based on the Lexical Quality Hypothesis. Data was collected from a 4-year longitudinal study of Dutch children in primary school with and without hearing loss to do an exploratory analysis of how lexical components (i.e., decoding skills, lexical decision, and lexical use) connected one to another and to reading comprehension.

The structural model provide the positive role that the quality of the mental lexicon play in reading

comprehension. The same conceptual model of reading development to both It was possible to apply to the groups of children. But, a multigroup comparison model showed that the predictive values of the relations between the different tasks differed for the two groups.

(Knoors and Marschark, 2012) indicated that bilingual education involving sign language and the written and spoken slang has been considered an essential educational intervention for deaf children. Although there is great growth in newborn hearing screening and technological devices as digital hearing aids and cochlear implants, but the number of deaf children is higher than before and they have the potential for acquiring spoken language. The question is about the role of sign language and bilingual education for deaf children, particularly those who are very young. The study concluded on the basis of previous studies, researchers should revise language planning and language policy to ensure that they are appropriate for the increasingly diverse number of deaf children.

(Bélanger et al., 2012) suggests that deaf people have enhanced visual attention to simple stimuli viewed in the para -vowel and periphery compared with hearing people. Although a large part of reading concludes processing the fixated words in vowel vision, readers also utilize information in Para vowel vision to preprocess next words and know where to look next. The study indicated that auditory deprivation affects low-level visual processing during reading by comparing the perceptual span of deaf who use sign language who were skilled and less-skilled readers with the perceptual span of skilled hearing readers. When deaf readers compared with hearing readers, the two groups of deaf readers had a larger perceptual span than would be expected given their reading ability. These results present the first proof that deaf readers' enhanced attentional allocation to the Para vowel is used during complex cognitive tasks, such as reading.

(Emmorey and Petrich, 2012) explained that there are two experiments investigate whether the same segmentation strategies are used for reading printed words and finger spelled words (in American Sign Language).The first experiment revealed that deaf and hearing readers performed better when written words were segmented according to an orthographically defined syllable (the Basic Orthographic Syllable Structure [BOSS]) than with a phonologically defined syllable. Analyses revealed that good deaf readers were more sensitive to orthographic syllable representations, and segmentation strategy did not differentiate the good hearing readers. Experiment 2, in contrast to Experiment 1, revealed better performance by deaf

participants when finger spelled words were segmented at the phonological syllable boundary. And it is clear that the spoken English that often accompany the written words promote a phonological preference for finger spelled words. In addition, finger spelling ability was significantly correlated with reading comprehension and vocabulary skills. These results indicate that the association between finger spelling and print for adult deaf readers is not based on shared segmentation strategies. So, we see that good readers and good fingerspellers established strong representations for English and that fingerspelling may help in establishing and developing English vocabulary (Joseph et al., 2009)

Indicated in their study identifies that there is a general limitation on printed text for language acquisition, that printed material only serve as a source of linguistic input to the extent that the learner is able to make use of phonological information in reading. Print is not an adequate source of input for language acquisition in learners with limited phonological knowledge of a spoken language such as acquisition of spoken language and literacy skills in deaf individuals.

Comparing deaf and hearing learners indicates the efficacy of print as a source of linguistic input and explored the role of phonological knowledge in decoding text. Hearing second-language (L2) learners, who have phonological knowledge of their spoken first language (L1), deaf learners often do not have phonological knowledge of a spoken language because they rely on sight rather than hearing for the processing of linguistic input. These conditions make deaf learners' development of English language and literacy skills are sharply deficient. Vision is the primary channel of communication for deaf, and they depend on a natural sign language, as a primary means of communication. Acquiring knowledge of the spoken language is a formidable challenge for deaf learners because hearing loss limits their ability to process speech.

(Connor et al., 2014) indicated that reading difficulties present serious and potentially lifelong challenges. Children who do not read well are more likely to be retained a grade in school, cannot complete high school. Preventing reading difficulties early in children's school benefits to individual and society. This study examined the review of journal articles and chapters resulted of research projects that focused on improving reading for children with reading disabilities. They reviewed research from grants that were initially awarded from 2002 through 2008 through the National Center for Education Research and the National Center for Special Education Research. Depending on this review, they found that these research projects have extended

knowledge about how to help students with or at risk for reading disabilities and how to prevent reading difficulties through valid and reliable assessments. This research has also helped to illuminate how children bring different and developing profiles of skills to the classroom with implications for assessment and instruction. Additionally, IES-funded research is improving reading instruction for children who are deaf or hard of hearing, who have intellectual disabilities, or other low incidence disabilities. Finally, research helped to present new knowledge on ways of bringing research-based assessment and instructional practices into the classroom by identifying and testing ways to improve the effectiveness of teachers and their practice. The research centers in IES continue to support rigorous research that will enable schools to implement effective instructional practices and interventions to help all students become better readers.

And study of (Cihon, et al., 2014) presents an effectively visual phonics intervention program for kindergarten children at high risk for reading failure in a general education classroom. That professional literature documenting the effectiveness of visual phonics for children who are hard-of-hearing or deaf. The preliminary results of this study suggest that See the Sound/Visual Phonics (STS/VP) intervention in the classroom is appropriate for children who are falling behind using the regular curriculum. Post-intervention gains were noted on both the Dynamic Indicators of basic Early Literacy skills (DIBELS) and the curriculum based assessment for participants who participated in the STS/VP intervention.

The data also suggest that participants performed similarly to their grade level peers who were at benchmark based on DIBELS and who did not receive the STS/VP intervention. Results are discussed in terms of future research opportunities.

(Charlesworth, et al.2006) in this study analyzed the structure of Reading Recovery lessons for children with hearing loss by examining and comparing the interactions of three Reading Recovery teachers of 12 children with hearing loss and three Reading Recovery teachers of 12 hearing children. All of the children were in the second year of primary school and were having difficulties with literacy learning. Codes were developed to represent the teacher interactions, categories of teaching focus, and teaching events that occur during Reading Recovery lessons. For each child, videotaped lessons from the third, middle and final weeks of Reading Recovery were coded, and the resulting data were analyzed and compared.

Reading Recovery was a successful literacy intervention for the children with hearing loss in this study. Although the teachers of the children with

hearing loss used teaching procedures similar to those used with the hearing children, they also used different communication behaviors and additional helping techniques. Like the teachers of the hearing children, the teachers of the children with hearing loss successfully taught the children how to use strategic activities necessary for message construction. The teachers of the deaf also helped the children through brief instructional detours focusing on world knowledge and language throughout the time spent in reading and writing. These teaching interactions can be used in teaching the literacy for children with hearing loss in the early years of school.

(Nathalie et al., 2012) indicated that deaf people often achieve low levels in reading skills. They investigated skilled and less skilled adult deaf readers' using of orthographic codes and phonological codes in reading. Experiment 1 used a masked priming paradigm to investigate automatic use of these codes during visual word processing. Experiment 2 used a serial recall task to determine whether orthographic and phonological codes are used to maintain words in memory. Skilled hearing, skilled deaf, and less skilled deaf readers used orthographic codes during word recognition and recall, but only skilled hearing readers relied on phonological codes during these tasks. Skilled and less skilled deaf readers performed similarly in both tasks, and this indicated that reading difficulties in deaf adults may not be linked to the activation of phonological codes during reading.

Levels of literacy for deaf readers is often much less than their hearing peers (DiFrancesca, 1972; Allen, 1986; Gallaudet Research Institute, 2004; Dubuisson, & Bastien, 2001) however some deaf individuals, reached to advanced levels in reading and for reasons that are still unclear but it is due to the degree of hearing loss (Conrad, 1979) and knowledge of the language that is read out (Goldin-Meadow & Mayberry, 2001) the age at which learning language (Padden & Ramsey, 2000; Mayberry, 2007) and learning sign language (Chamberlain and Mayberry, 2008). Deaf readers mainly develops voice acting through their non auditory channels (i.e., visual lip reading and articulatory speech production)). This input may be insufficient for developing fully specified phonological representations (Kelly & Barac-Cikoja, 2007). If the lack of fully specified phonological representations was indeed the main source of reading difficulties, no severely or profoundly deaf reader would become a skilled reader (Kelly & Barac-Cikoja, 2007). It has been suggested by many researchers that the elderly deaf who read better, is only using the audio information in reading (for example, Hanson and Fowler, 1987 ; and Conner and Handley, 2008).

2. Method and procedures Study sample:

The study included 120 hearing impaired students in primary school enrolled in deaf schools in Jeddah, 30 deaf male students and 30 deaf female students, who was using sign language, (30) hard of hearing male students and (30) hard of hearing female student, who do not use sign language.

Study Tools:

A test of reading skills: It was prepared by researchers for this purpose, depending on the survey and a review of the literature and previous studies related to the assessment of reading skills among hearing impaired students such as (Alzeriqat 2012), (Dechant & Smith, 1977), (Briscoe, et al., 2001), the study of (Stephanie, 2008), and study (Gilbertson & Ferre, 2008).

The test in its initial form included of 42 audio question, distributed on four axes of deaf reading skills ; vocabulary, letters, fluency, visual discrimination and understanding, and then presented to the arbitrators. The test in its final form consists of 39 questions distributed on four axes, which are as follows:

The first dimension:

Vocabulary: Remember new vocabulary, learn abstract words, vocabulary classification, put vocabulary in sentences

The second dimension:

Fluency : Reading the words of two syllables, read the words of more than two syllables, Independent reading without help

The third dimension: Visual - audio discrimination includes (remembering new vocabulary, reading familiar words, interesting in learning new vocabulary, reading syllables, reading simple sentence, discrimination of the image linking it to the word it means visually, Reading the text, focusing on the visual aspects of the word)

The fourth dimension: comprehension (understanding simple sentences, understanding the language, the appropriate answer to the questions, understanding the text, identifying the main ideas in the text)

judge the performance level of the study sample in reading skills was judged on the basis of one degree for each point of the questions so as to reach the final degree for the test (78).

The teacher of the classroom apply the test to assess the reading performance level for members of the study sample, according to the correction system mentioned before.

Veracity of the test:

The veracity content was used, where the test was showed to 11 specialists in this area; in order to get their views on the appropriateness of the paragraphs and if they are related to the areas to which

they belong, as well as the adequacy of the number of paragraphs of the field. paragraph which increased the proportion of agreement by the arbitrators to 8 has been retained, representing 80% or more. Examples of paragraphs that are adjusted: "remember sounds of the letters" was adjusted to "remember the sounds of the letters and distinguish them in words.

Constancy of the test

To check the constancy of the data gathered through the test, the researcher used the stability of re-testing for a group was randomly selected from outside the study sample, and numbered 40 of the deaf and hard of hearing using equation of Cronbach alpha coefficient of 0.611, which is acceptable for research purposes.

Design and Statistical Analysis:

The present study is a descriptive survey study aimed to assess the reading skills of hearing-impaired students. The study included the following variables:

The independent variables were filled out by teacher of the students and by reference to the files in the school and included:

- Gender: It has two levels Male and Female.

•Type of disability, deaf and hard of hearing and has two levels (deaf do not use a hearing aids, heard of hearing use hearing aids).

3. Results:

The results of the first question:

Q 1: What is the level of performance of the hearing-impaired students in reading skills? To answer this question, the averages and standard deviations of the performance of Study individuals calculated on the dimensions of the test.

The averages and standard deviations of the performance of Study individuals calculated on the dimensions of the test.

The results of the second question:

Q 2: Does the level of performance of hearing impaired students differ in the reading skills depending on the type of hearing disability?

To answer this question, the averages and standard deviations of the performance of Study individuals depending on the variable type of hearing disabilities were calculated, using the t-test to check the level of significance of differences statistically, and the test used analysis of variance to determine the level of significance of differences statistically as in the table (6).

Table (1): averages and standard deviations of the performance of Study individuals on the dimensions of the reading skills test

	N	Minimum	Maximum	Mean	Std. Deviation
Words	120	6.00	22.00	13.6417	3.61090
Flun	120	1.00	9.00	4.2000	1.88135
Disting	120	2.00	10.00	5.0417	2.14749
Under	120	2.00	7.00	4.0250	1.37482
Valid N (listwise)	120				

Table 2: averages and standard deviations for the performance of the study sample of deaf and hard of hearing on the dimensions of reading skills test

Type	N	Minimum	Maximum	Mean	Std. Deviation
Words	60	6.00	18.00	12.1833	3.23378
Flun	60	1.00	7.00	3.1333	1.34626
1.00 Disting	60	2.00	7.00	3.5167	1.20016
Under	60	2.00	6.00	3.6500	1.19071
Valid N (listwise)	60				
Words	60	6.00	22.00	15.1000	3.39341
Flun	60	1.00	9.00	5.2667	1.73564
2.00 Disting	60	4.00	10.00	6.5667	1.76948
Under	60	2.00	7.00	4.4000	1.45206
Valid N (listwise)	60				

Table (3): averages and standard deviations for the performance of the study sample males and females on the items of the test reading skills

Gen	N	Minimum	Maximum	Mean	Std. Deviation	
1.00	Words	60	6.00	21.00	13.1667	3.72880
	Flun	60	1.00	8.00	4.2000	1.82078
	Disting	60	2.00	9.00	4.4667	1.82698
	Under	60	2.00	7.00	4.0333	1.46098
	Valid N (listwise)	60				
2.00	Words	60	7.00	22.00	14.1167	3.45475
	Flun	60	1.00	9.00	4.2000	1.95544
	Disting	60	2.00	10.00	5.6167	2.30027
	Under	60	2.00	7.00	4.0167	1.29525
	Valid N (listwise)	60				

Table 4: averages and standard deviations for the performance of the study sample of male and female deaf and males and females hearing-impaired on the dimensions of reading skills test

group	N	Minimum	Maximum	Mean	Std. Deviation	
1.00	Words	30	6.00	18.00	11.9000	3.47751
	Flun	30	1.00	7.00	3.2000	1.44795
	Disting	30	2.00	6.00	3.2000	.96132
	Under	30	2.00	6.00	3.6333	1.18855
	Valid N (listwise)	30				
2.00	Words	30	7.00	18.00	12.4667	3.00268
	Flun	30	1.00	6.00	3.0667	1.25762
	Disting	30	2.00	7.00	3.8333	1.34121
	Under	30	2.00	6.00	3.6667	1.21296
	Valid N (listwise)	30				
3.00	Words	30	6.00	21.00	14.4333	3.58813
	Flun	30	2.00	8.00	5.2000	1.60602
	Disting	30	4.00	9.00	5.7333	1.59597
	Under	30	2.00	7.00	4.4333	1.61210
	Valid N (listwise)	30				
4.00	Words	30	10.00	22.00	15.7667	3.10376
	Flun	30	1.00	9.00	5.3333	1.88155
	Disting	30	4.00	10.00	7.4000	1.54474
	Under	30	3.00	7.00	4.3667	1.29943
	Valid N (listwise)	30				

Table (5) averages and standard deviations for the reading skills of students by type of hearing loss; deaf and hard of hearing

	Type	N	Mean	Std. Deviation	Std. Error Mean
Words	1.00	60	12.1833	3.23378	.41748
	2.00	60	15.1000	3.39341	.43809
Flun	1.00	60	3.1333	1.34626	.17380
	2.00	60	5.2667	1.73564	.22407
Disting	1.00	60	3.5167	1.20016	.15494
	2.00	60	6.5667	1.76948	.22844
Under	1.00	60	3.6500	1.19071	.15372
	2.00	60	4.4000	1.45206	.18746

Table (6) averages and standard deviations and t-test to examine the significance of differences between the deaf and hard of hearing people for reading skills

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Words	.267	.606	-4.820-	118	.000	-2.91667-	.60515	-4.11503-	-1.71830-
Flun	6.404	.013	-7.523-	118	.000	-2.13333-	.28357	-2.69489-	-1.57178-
Disting	11.701	.001	-11.050-	118	.000	-3.05000-	.27603	-3.59661-	-2.50339-
Under	2.566	.112	-3.094-	118	.002	-.75000-	.24243	-1.23007-	-.26993-

Table (7) analysis of variance to examine differences in students' reading skills for deaf and hard of hearing, according to the degree

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Words	Between Groups	286.692	3	95.564	8.764	.000
	Within Groups	1264.900	116	10.904		
	Total	1551.592	119			
Flun	Between Groups	137.067	3	45.689	18.653	.000
	Within Groups	284.133	116	2.449		
	Total	421.200	119			
Disting	Between Groups	326.758	3	108.919	56.904	.000
	Within Groups	222.033	116	1.914		
	Total	548.792	119			
Under	Between Groups	16.958	3	5.653	3.153	.028
	Within Groups	207.967	116	1.793		
	Total	224.925	119			

Table 8 shows the results of Bonferroni and Scheffe test

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Words	Scheffe	1.00	2.00	-.56667-	.85262	.931	-2.9855-	1.8522
			3.00	-2.53333*	.85262	.036	-4.9522-	-.1145-
			4.00	-3.86667*	.85262	.000	-6.2855-	-1.4478-
		2.00	1.00	.56667	.85262	.931	-1.8522-	2.9855
			3.00	-1.96667-	.85262	.156	-4.3855-	.4522
			4.00	-3.30000*	.85262	.003	-5.7189-	-.8811-
	Bonferroni	1.00	2.00	-.56667-	.85262	1.000	-2.8553-	1.7220
			3.00	-2.53333*	.85262	.022	-4.8220-	-.2447-
			4.00	-3.86667*	.85262	.000	-6.1553-	-1.5780-
		2.00	1.00	.56667	.85262	1.000	-1.7220-	2.8553
			3.00	-1.96667-	.85262	.137	-4.2553-	.3220
			4.00	-3.30000*	.85262	.001	-5.5886-	-1.0114-
Flun	Scheffe	1.00	2.00	.13333	.40410	.991	-1.0131-	1.2797
			3.00	-2.00000*	.40410	.000	-3.1464-	-.8536-
			4.00	-2.13333*	.40410	.000	-3.2797-	-.9869-

		2.00	1.00	-.13333-	.40410	.991	-1.2797-	1.0131	
			3.00	-2.13333*	.40410	.000	-3.2797-	-.9869-	
			4.00	-2.26667*	.40410	.000	-3.4131-	-1.1203-	
		3.00	1.00	2.00000*	.40410	.000	.8536	3.1464	
			2.00	2.13333*	.40410	.000	.9869	3.2797	
			4.00	-.13333-	.40410	.991	-1.2797-	1.0131	
		4.00	1.00	2.13333*	.40410	.000	.9869	3.2797	
			2.00	2.26667*	.40410	.000	1.1203	3.4131	
			3.00	.13333	.40410	.991	-1.0131-	1.2797	
		Bonferroni	1.00	2.00	.13333	.40410	1.000	-.9514-	1.2180
				3.00	-2.00000*	.40410	.000	-3.0847-	-.9153-
				4.00	-2.13333*	.40410	.000	-3.2180-	-1.0486-
2.00	1.00		-.13333-	.40410	1.000	-1.2180-	.9514		
	3.00		-2.13333*	.40410	.000	-3.2180-	-1.0486-		
	4.00		-2.26667*	.40410	.000	-3.3514-	-1.1820-		
Disting	Scheffe	1.00	2.00	-.63333-	.35722	.374	-1.6468-	.3801	
			3.00	-2.53333*	.35722	.000	-3.5468-	-1.5199-	
			4.00	-4.20000*	.35722	.000	-5.2134-	-3.1866-	
		2.00	1.00	.63333	.35722	.374	-.3801-	1.6468	
			3.00	-1.90000*	.35722	.000	-2.9134-	-.8866-	
			4.00	-3.56667*	.35722	.000	-4.5801-	-2.5532-	
	Bonferroni	1.00	2.00	-.63333-	.35722	.473	-1.5922-	.3255	
			3.00	-2.53333*	.35722	.000	-3.4922-	-1.5745-	
			4.00	-4.20000*	.35722	.000	-5.1589-	-3.2411-	
		2.00	1.00	.63333	.35722	.473	-.3255-	1.5922	
			3.00	-1.90000*	.35722	.000	-2.8589-	-.9411-	
			4.00	-3.56667*	.35722	.000	-4.5255-	-2.6078-	
Under	Scheffe	1.00	2.00	-.03333-	.34572	1.000	-1.0141-	.9475	
			3.00	-.80000-	.34572	.154	-1.7808-	.1808	
			4.00	-.73333-	.34572	.218	-1.7141-	.2475	
		2.00	1.00	.03333	.34572	1.000	-.9475-	1.0141	
			3.00	-.76667-	.34572	.184	-1.7475-	.2141	
			4.00	-.70000-	.34572	.257	-1.6808-	.2808	
	Bonferroni	1.00	2.00	-.03333-	.34572	1.000	-.9613-	.8947	
			3.00	-.80000-	.34572	.135	-1.7280-	.1280	
			4.00	-.73333-	.34572	.216	-1.6613-	.1947	
		2.00	1.00	.03333	.34572	1.000	-.8947-	.9613	
			3.00	-.76667-	.34572	.171	-1.6947-	.1613	
			4.00	-.70000-	.34572	.271	-1.6280-	.2280	

*. The mean difference is significant at the 0.05 level.

4. Discussion of results:

The results indicated that all Study individuals on all dimensions by testing reading skills for the hearing impaired were classified as weak except letters dimensions and vocabulary was average, the study results indicated the presence of statistically significant differences between the deaf and hard of hearing, that hard of hearing are the best in results of reading skills test for the hearing impaired on all axes of the test, This may due to that the literacy abilities of hearing impaired are affected by their hearing and the degree of hearing loss, which affects the perception of sounds and syllables, which are important in the development of reading skills and gaining awareness of sounds of language, and this study confirms the existence of problems in the acquisition of vocabulary and verbal expression and audio- visual discrimination

and understanding for reading texts increases with the degree of hearing loss due to that reading depend on hearing, and the lack of experience prior knowledge of words and their meaning.

Weak auditory discrimination skills, and lack of training and exits letters these findings are consistent with the results of a study of all (Trezek & Wang, 2006), (Gibbs, 2004), (Stephanie, 2008), (Moreno Harris, 2006), (Alzeriqat, 2011).

It also signals the study results to the presence of statistically significant differences between boys and girls of the Deaf and Hard of Hearing in favor of females possibly due to interest females in general to learn new vocabulary and organize words and understand the meanings of words in different contexts and thus understand the text reading more

It also signals the study results to individuals hearing impaired deaf and hearing impaired people who are just learning to use sign language harvest linguistic weak and abilities to read weak, while individuals hearing impaired deaf and hearing impaired people who are learning using communication overall and exits letters sensory and auditory discrimination harvest good language and reading abilities to good and high academic achievement.

Recommendations:

1-Employing assistive technology, tablets and ipads devices for training hearing impaired children on the correct pronunciation of the Arabic and Visual - audio discrimination for improving reading activities.

2- Employing technology of avatar of sign language for improving reading activities for deaf.

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