

Relationship of Braille Reading Skills with Onset of Visual Impairment in Mainstream Setting

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Abstract

The study was conducted to find out the relationship between Braille reading skill of children with visual impairment and onset of visual impairment in the context of Pakistan for which there were no studies as yet. The current study evaluated the Braille reading skill of children with visual impairment (both congenitally and acquired visually impaired) in Braille reading skill. Researcher scrutinizes the relationships among the braille reading skill and onset (age at loss of vision) on the basis of reading subtests. One hundred twenty-seven (127) boys and girls with visual impairment from different classes of five institutions of Lahore were the samples of this study. The students who contributed were registered in public and private special schools for blind children. T-test revealed braille reading speed, braille reading comprehension, vocabulary, braille contraction and braille reading skills of male and female children with visual Impairment are significantly different. It was concluded that braille reading skills of children with visual impairment is negative related to onset of visual impairment.

Keywords: braille reading, visual impairment, performance of braille reading.

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Introduction

Children with visual impairment who use braille for reading read at a rate which is much slower than children who can see properly and read print material (Chen, Liang, Lu, Potměšil, & Zhong, 2019). There is also a large variation in braille reading speed which also depends on the objectives of the reading activity (Vellutino, Fletcher, Snowling, & Scanlon, 2004). According to Corn et al. (2002) there is a large difference in the reading speed of elementary and secondary school pupils those who have normal sight as well as those who have deficit vision. Research also indicates that the period of learning affects the reading speed of pupils. Bertelson, Mousty, and D'alimonte (1985) critically proved that those children who learn Braille before 10 years old age are proficient reader compared to those who learned later in the age.

The students who learn reading through Braille has a low sensation of tactual perception which makes them slow readers in comparison to print readers. But, mostly visually impaired students can overthrow this problem with the help of experience and training. For the improvement of reading speed of pupils with visual impairment, instructional teaching has been identified. Corn and Koenig (2002) suggests that daily training of approximately one to two hours is required to develop the Braille literacy skills.

Proficient reading of braille is typically considered is a combination of words per minutes (WPM) and comprehension (Khalid, Buari, & Chen, 2017; Perfetti, Yang, & Schmalhofer, 2008). It is also usually acceptable that efficient word reading skills are essential, but not sufficient for fruitful reading comprehension, with other kinds of processing being significant to both word and comprehension reading (Vellutino et al., 2004). Recognition of panted words and listening comprehension skills are both responsible for fruitful comprehension of reading. As these skills include multifaceted linguistic, meta-linguistic and cognitive abilities and the collaborations amongst them, there are numerous techniques in which reading comprehension can be analyzed (Nation, 2005). Vellutino, Tunmer, Jaccard, and Chen (2007) regarding their model of reading stated that like language

comprehension there are many variations in word recognition. In addition, reading comprehension has a similar rank in the improvement of reading.

For readers who are in their early stage of learning, word identification abilities and phonological abilities are very important at the primary level. Not only word recognition abilities are important, listening comprehension, including semantic and syntactic abilities are also considered very significant. Emerson, Holbrook, and D'Andrea (2009) stated that transitory description in reading comprehension that is likely to the average speed of reading showed by pupils. The poor reading attainment of students with Visual Impairment (VI) and the lifelong concerns of small reading ability makes it imperious that Teachers of the Visually Impaired (TVIs) use Braille teaching practices that have a demonstrated record of success. Reading speed is a significant deliberation of the confidence that contractions raise the reading speed of Braille readers. However, there is a large variety of reading speeds mentioned in earlier literature. Initial studies conducted to measure Braille reading speeds reported an average of 90 words per minutes (WPM), with means of 116 WPM for pupils in segregated institutes and an average of 149 WPM for government schools students. Nolan and Kedris (1969) in their review of eight studies found an average reading speed of 49 WPM for six graders and 83 WPM for high school students. (Foulke, 1991), testified that the junior high institute level's pupils have 65–76 WPM verbal reading speeds.

According to Nilsson (1982), a rational evaluation of unconstructed Braille reading measured only those words in which contractions are not used. Her study covered the advantages of unconstructed Braille and also deliberate the results of contractions which effect those text materials that available in unconstructed braille that is usually intricated in contracted Braille. In 1992, Troughton conducted a study in Ontario, Canada on students, age ranges are 6.6 to 70.9. Seventy-five percent were congenitally blind. The study was about contracted and unconstructed reading documents. She found a variation of 113 to 125 pupils read unconstructed Braille speedily and only 19 read rapidly in contracted Braille. She declared that unconstructed Braille is read more rapidly than contracted Braille.

Educator must assess the strengths and weakness of the visually impaired children so that pertinent educational placements and programs are provided. They can create educational evaluation with the help of specific teste, assess the current achievement levels of the pupils, make amendments accordingly and advice appropriate changes in curricular implementation. The educational evaluation is a combination of different tests like formal and informal which meet these needs. These evaluations are useful to compare child's performance with that of other students of similar age, grade, and other characteristics (Argyropoulos & Papadimitriou, 2015). With the help of these tests, the teacher examines the skills of pupils in different topics and subjects and compare them with each other.

Altered teaching approaches can be used for teaching students as well as for normal print reader students. To use these different types of methodologies more efficiently for a student with visual impairment some useful modifications are needed according to his/her special needs. It is a difficult task for a teacher to choose an appropriate and suitable method for teaching a student with visual impairment which meets his/her unique needs (Stecker, Roser, & Martinez, 1998). The objective of this study is two-fold: 1) To find out the gender difference in English braille reading skills and 2) relationship between English Braille reading skill of visually impaired children and the onset of visual impairment are the main objectives of this research.

The study will help the visual impairment of children in the school learning the Braille. It will cover up the difficulties in Braille learning skills. It is the responsibility of professionals to understand the student problem faced during Braille reading in blind students in our institutions in which students are the future. Sometimes students have to face many challenges and they find it difficult, it is the moral duty of teachers, schools and other institutes that they understand the problems of these students and give them proper information. The English Braille reading skills were under consideration in this study.

Methods and Participants

The correlational descriptive design of the research was used to carry out by using the non-random sampling technique which is purposive sampling technique. Self-reported reading scales were used in this study. Data was collected from visually impaired students studying in 4th to 9th grades in special education institutions for the blind pupils situated in Lahore city. The sample of the study contained 127 students. There were 54% males and 46% females' students. The age range of the students was from 11-19 years old, from class 4th to 9th. For the selection of the sample, purposive sampling techniques were used. Total 127 subtests were circulated and the comeback rate was 100% because tests were managed personally. The sample comprised of 65% of public and 35% from private sector's school for blind children of Lahore city.

Instruments

The subtest of Braille reading speed (measured by counting the correct words per minute) consisted of graded paragraphs consisting of 120 to 170 words according to grade levels of students with visual impairment. This subtest was based on two parts which evaluated the Word comprehension and passage comprehension.

Word Comprehension (Vocabulary)

This subtest assessed Braille Reading Vocabulary of students with visual impairment. It was contained on graded words. The list of graded words was consisting of 20 words (antonyms and synonyms) according to grade levels of students with visual impairment which was selected from their English textbooks.

Passage Comprehension

The passages used for Braille reading speed were also used for measuring the passage comprehension abilities of students with visual impairment. They were selected from their English

textbooks. These were consisting of 120 to 170 words, according to grade level of students with visual impairment and at the end of passages reading, 10 reading comprehension questions were asked to the students and marked as correct and incorrect answers.

Reliability of Instrument

Cronbach's alpha value for Braille reading skills test was 0.723.

Data Collection

The test was personally managed by the researchers in a face to face meeting. The researchers visited the schools and get informed consent from principals and teachers of visually impaired students. First of all, we gave details about all items of the test to the students with V.I verbally and then administered the tests one by one.

Following schools were selected to collect the data.

- Govt. Secondary School for the Blind Girls, Allama Iqbal Town, Lahore.
- National Special Education Center for Visually Impaired Children, Johar Town, Lahore.
- Govt. Boy's Sunrise Institute for the Blind, Lahore.
- Govt. Institute for the Blinds, Sheranwale Gate, Lahore.
- Aziz Jahan Begum Trust for Visually Impaired Children, Lahore.

Study Procedure

The researcher used the cross-sectional co-relational descriptive research design. The researcher constructed a test for determining the Braille reading skills of visually impaired students. The researcher visited the schools of visually impaired students and got information through reading tests from students. The data were personally collected by the researcher. Braille Reading skills were measured in four ways; reading speed, comprehension, vocabulary and Braille contractions i.e. the total computation of these four elements.

For the purpose of data collection, the permission was taken from the school administration through informed consent form to survey their students. In the first step, information was gathered about schools and exact figures of students in classes. Then the sampling frame of students in public and private schools was drawn. Afterward the students from five schools were approached. They were conversant about the determination of the study before the test administration; their consent to contribute in the study was taken. First of all, the consent of participation in the study was taken to the students by awaking them about the determination of the study, after that was taken.

The sequence of the test was as; letter identification, Braille reading speed, vocabulary, comprehension, and mastery in Braille contractions and their rules. First of all, a number of reading test charts was raised to estimate the Braille reading performance. This was completed after discussion with specialists, English teachers of students with V.I at their schools and supervisor of the study because there were no standardized test charts developed for such a purpose when the study was conducted. The Braille reading charts used for measuring Braille reading skills consisted of paragraphs from English textbooks of children with visual impairment.

Research related to normal children mentioned that an expressive context assisted reading process. Parallel effects of context have been described for low vision readers (Bullimore & Bailey, 1995). The test charts used for testing Braille reading speed, comprehension, vocabulary and Braille contractions were converted into Braille by the computerized Braille printing press, Punjab, Lahore with the special consent of the director of Special Education Punjab. The students were requested to read audibly while the assessor noted time engaged to complete the test and also observe the mistakes of students.

Following reading mistakes were counted by examiner: mispronunciation, substitution, addition, and omission. Reading speed was checked by counting the number of words which were read properly in sixty seconds (wpm). Those visually impaired children who read slowly were asked by the examiner for a short break to overcome the fatigue and control the stress so that they perform very well.

After this short break, the reading comprehension test was taking. Same passages were used to measure reading comprehension. First, students were instructed to thoroughly read the passages. Later they were given 10 questions to answer but were not allowed to refer back to the comprehension passages. No time restrictions were carried out to complete the vocabulary, comprehension and Braille contractions test. The time students took to complete the test was also not noted. Results of correct answers were presented in percentages. After data collection; the obtained scores of tests of each student were computed one by one for the measurement of Braille reading skills and entered in software SPSS 16. Then it was tabulated and analyzed by using the statistical method. Frequency, percentage, Descriptive statistics, independent t-test and Pearson correlation coefficient tests were conducted on SPSS version 16. Discussion and conclusions were drawn.

Data Analysis

The results of the study were given in two sections. First, we presented the frequencies and percentage of scores of students with V.I. Braille reading speed, comprehension, vocabulary, Braille contractions, and Braille reading skills tests. Second, we discussed the inferential analysis results. This included independent t-test to compare between males and female's contraction test and reading test. We also performed Pearson correlation coefficient tests for measuring difference and relationship between Braille reading skills and the onset of visual impairment. The results were shown in the form of tabulation.

Table 1

Frequency and percentage of scores of children with visual impairment in a vocabulary test

Scores	Frequency	Percentages
1-5	0	0%
6-10	7	5%
11-15	25	20%
16-20	95	75%
Total	127	100%

We divided the scores into four ranges, 1-5, 6-10, 11-15, 16-20. Table No1 shows that 75% students got a high range of score in vocabulary test.

Table 2

Frequency and percentage of scores of children with visual impairment in Braille reading skills test

Scores	Frequency	Percentages
Below 50	1	1%
51-100	18	14%
101-150	12	9%
151-200	17	13%
201-250	30	24%
251-300	32	25%
301-350	13	10%
351-400	5	4%
Total	127	100%

The second was reading skills test. The scores were divided into 8 levels. We found that maximum numbers of students (32, 25%) had score 251-300 followed by 24% (30) students had scores 201-250.

Table 3

Mean and standard deviation and t value of scores of students with visual impairment in Braille contraction test.

Gander	N	Mean	Standard Deviation	t-value	Sig (2-tailed)
Male	69	1.03	65.76	-3.92	.000
Female	58	1.41	36.49		

The mean difference between females and males is 0.38. The t-value is -3.92 which was significant. This depicts that mean of Braille contraction test is significantly different for females and males.

Table 4

Mean and standard deviation and t value of scores of students with visual impairment in Braille reading skills.

Gender	N	Mean	Standard Deviation	t-value	Sig (2-tailed)
Male	69	1.88	89.14	-3.93	.000
Female	58	2.44	65.16		

The mean difference between females and males is 0.56. The t-value is -3.93 which was significant. This depicts that mean of Braille reading skills is significantly different for females and males.

Table 5

Person correlation coefficient among Braille reading skills scores of students with visual impairment and onset of visual impairment.

	Onset	BRP	Sig (2-tailed)
Onset		-.201*	.024
BRP	-.201*		

Table no 5 Showed that correlation between the onset of visual impairment and braille reading is negative and significant. This shows that as the age of onset increases the braille reading skills decreases.

Results and Discussion

The focus of the research was to study the Braille Reading Skills of Children with visual impairment and Its Relationship with the Onset of Visual Impairment. The first question of our study is there any significant difference in gender difference in Braille reading skills of children with visual impairment. Findings revealed significant difference and also supported by previous

studies. It is necessary that the pupils should use Braille on daily bases and for a long time period; early Braille instructions were also a very important factor that can improve the individual's speed and other components of Braille reading.

The students who read Braille speedily can read as quickly as a print reader scan decode 150 words per minute roughly, about half the speed of print readers on an average rate. Normally, the reading speed of Braille readers is at about half of the speed of print readers, because print readers read 150 words per minute (Pring, 1984). Nolan and Morris (1971) determined that a subject's gender had no significant effect on the ability to discriminate patterns actually.

Moodley (2004) examined 33 blind subjects 8 to 21 years old. Found significant differences between visually impaired males and females, aged 9 to 20, in their ability to discriminate line width. Rex, Koenig, and Baker (1994) stated that although many items and documents for Braille teaching are available, these are not suitable for every young and school-going child. The benefit of this technique is that pupils with low vision comprehend the text document, they use it alone or with the combination of other techniques when they are able to use different Braille patterns of outlines. Steinman, LeJeune, and Kimbrough (2006) noted that some studies have found no significant differences between grade levels in tactile discrimination ability, whereas other studies have found a difference between elementary and secondary students. These differences may be due to the great variability of preschool experiences among blind children, resulting in great variation in tactile discrimination ability across grades levels of these children. Children who have significant vision loss and blindness are facing problems relating to reading speed and accuracy and increased hazard of literacy (Coppins & Barlow-Brown, 2006).

The second question of our research was that is there any significant relationship between Braille reading skills of children with visual impairment and onset of visual impairment. The findings showed a significant negative correlation between age of onset of visual impairment and Braille reading skills. Previous researches conducted by Hatton, Erickson, and Lee (2010) and Steinman et al. (2006), found that the pupils who are taught using the un-contracted form of Braille performed at a much lower level

in reading skills than those who had been taught the contractions. Ryles (1996) originate that children with visual impairments who learned Braille were more expected to obtain a good job and acquire a college degree than those who did not learn braille. Wolffe and Kelly (2011) stated in a study that higher levels of knowledge are related to virtuous employment consequences for both Braille and print readers. In addition, reading skills donates to the emotional and passionate well-being of students with visual impairments (Ferrell, Mason, Young, & Cooney, 2006).

Recommendations

Keeping in view the conclusion of the study, the following recommendations may prove fruitful:

1. Student's Braille reading performance should be accessed through reading assessment tests of speed, comprehension, vocabulary, Braille contractions, and Braille reading skills.
2. For good results in reading skills tests, it needed more practice and time to become a master in Braille code and to develop decoding skills because phonics and decoding skills have to apply more character than a present in print alphabetical and symbols which make literally using Braille more complicated than print.
3. It seems that female has a better performance in Braille reading skills which means teachers should be concerned about those factors which are causing males to lack behind. Further exploration is recommended in this context
4. The negative relationship between age of onset of visual impairment and Braille reading skills depicts that adults find it hard to learn Braille as compared to the young students.

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