

Effects of Phonological Awareness Training on the Reading Performance of Children with Dyslexia in Primary Schools in Maiduguri Metropolis, Borno State, Nigeria

Alice Kyauta Jauni Musa^{1,*}, Adamu Zharakahyel Balami²

¹Department of Education, University of Maiduguri, P. M. B. 1069, Maiduguri, Borno State, Nigeria

²Department of Education, Ramat Polytechnic Maiduguri, Borno State, Nigeria

*Corresponding author: akjmusa@yahoo.com, kyautajam@gmail.com

Abstract The study determined the effects of training in phonological awareness skills on the reading performance of children with dyslexia in primary schools in Maiduguri Metropolis. Two hypotheses, which sought to determine the significant effects of phonological awareness training on reading performance of children with dyslexia and the significant effect of sex on the intervention guided the study. The design of the study is quasi-experiment. A sample of 15 (8 boys and 7 girls) primary two pupils, purposefully selected in a private school, participated in the study. Phonological Awareness Skills Test (PAST), with Cronbach Alpha Coefficient reliability of 0.87, was used to give intervention on four phonological awareness skills - word identification, word deletion, word blending and word rhyming for 8 weeks, while a reading passage (Cloze test) was used to determine the reading levels of the participants before and after the intervention. Simple percentage and t-test were used to analyze the data at 0.05 level of significance. The results revealed that the training in phonological awareness skills significantly improved the reading performance of the children with dyslexia. However, there is no significant effect of sex on the intervention. Universities and colleges of education should give students specializing in English Language training in handling dyslexia to enable them identify children with dyslexia in their classes and attend to their needs in their teaching in view of the move towards inclusive education.

Keywords: *effect, phonological awareness skills, reading, performance, children with dyslexia*

Cite This Article: Alice Kyauta Jauni Musa, and Adamu Zharakahyel Balami, "Effects of Phonological Awareness Training on the Reading Performance of Children with Dyslexia in Primary Schools in Maiduguri Metropolis, Borno State, Nigeria." *American Journal of Educational Research*, vol. 4, no. 15 (2016): 1078-1085. doi: 10.12691/education-4-15-5.

1. Introduction

Reading is an indispensable skill in modern day societies and particularly in educational advancement of pupils/students because it provides access to written knowledge. Therefore, impaired reading can affect children's school achievement and educational career. Some of the basic functions of primary education in Nigerian, as spelt out in the National Policy on Education (NPE) are to ensure that children acquire permanent literacy and numeracy ability to communicate effectively and to develop skills needed for effective functioning in the society as well as to lay solid foundation for future education of pupils ([14]: 09). Therefore, primary school provides the foundation for the child's advancement in reading and writing.

Reading, according Chall and Stahl [9], is an activity characterized by the translation of symbols/letters, into words and sentences that have meanings to the individual. The ultimate goal of reading is to be able to understand

written material, to evaluate it, and to use it for one's needs. Therefore, reading is central to the child's intellectual development because a child who is a poor reader is likely to be a poor learner. Thus, Education for All [13] reported that no nation can aspire to achieve its full development potentials unless its entire people, (men, women, boys and girls), including those with learning difficulties, such as children with dyslexia, participate in this process of development.

However, while most children find the learning processes exciting, others develop fear and anxiety about school and may not likely cope adequately with schooling. This is not because they are blind, impaired of hearing and speech, nor are they unintelligent or lazy, but they have a learning difficulty known as dyslexia. Dyslexia is an inability or difficulty to learn to read or spell, despite otherwise normal intellectual functions. It is a neurological disorder that poses difficulty in achieving proficiency in reading in spite of adequate sensory ability, intellectual skills and schooling [20,21].

The International Dyslexia Association (IDA) [20,21] proposes that dyslexia is evident when accurate and fluent

word reading or spelling develops very incompetently or with great difficulty despite appropriate learning opportunities which are effective for the great majority of children. Dyslexia primarily affects the skills involved in accurate and fluent word reading and writing. Therefore, it puts huge constraint on the learning of the child. Scarborough [38] states that dyslexia can hinder children's ability to read, write, spell and sometimes speak or demonstrate difficulty in processing text at words level. Dyslexics are unable to read words accurately and automatically have difficulty storing word banks and meanings as well as identifying sound patterns. Furthermore, dyslexics are inclined to reverse letters or words. For example, b for p; have a short memory span, directional confusion like being uncertain about left and right, difficulty with written language and figures [8]. Andzayi [2] also stressed that such children normally confuse letters like b and d, p and q, u and n. Some have difficulties learning the letter sound systems, difficulty in rapidly and accurately recognizing and naming letters.

Additional common characteristics among people with dyslexia are difficulty with spelling; phonological processing (manipulation of sound), phonological awareness, phonological decoding, orthographic coding and auditory, short-term memory and rapid visual responding, difficulty copying from chalkboard, slow and laborious writing and disorganization of written work, despite having good background and normal intelligence [17].

Phonological awareness is the ability to work explicitly with sound elements smaller than the syllable. It involves the recognition, discrimination, and manipulation of sounds in spoken language as well as focusing on different sizes of the sound unit like syllables, onsets and rhyme, or phonemes [3]. Wimmer, Landerl, Linortner and Hummer [55] explained that being able to separate and manipulate phonemes is a critical step for insight into the alphabetic principle because the comprehension of correspondences between letters and sounds hardly emerges spontaneously in young children which in turn requires phonological awareness [41]. Therefore, children with dyslexia who have impaired phonological awareness seem to experience difficulties in abstracting letter-sound correspondences and thus fail to develop phonological recoding of letter patterns into spoken words [23]. Recoding refers to the ability to apply the knowledge of letter-sound correspondences to correctly translate a printed word into sound. The process of recoding requires access to the mental phonological representation but does not necessarily require access to the meaning of the word [24].

Phonological awareness is important because it strongly supports learning how language is represented in print; and enables the dyslexics acquire the ability to notice, hear, identify and manipulate word parts, including phonemes, syllables, onset and rhyme. Large number of children with dyslexia lacks these skills. Therefore; they find it difficult to cope with reading in the class [1,4,43,47]. Lack of phonological awareness skills, Onyenachi [34] explains, has been found to be a high predictor of reading difficulty. Hence, Children who have poor phonological skills do find it difficult to identify words, blend words or segment them as well as have difficulty understanding rhyming words. They also have poor language skills and poor rapid automatic naming of letters and words. The inability of children to process the phonological features of language

is the most common characteristics of reading difficulty. A poor or immature phonological awareness would impact adversely on children's ability to identify initial, medial and final sounds, onset rhymes, syllables and word families. Failure to acquire these skills leads to reading difficulties in both young children and adults.

Reading is the most important skill that children must acquire at school, because one learns to read to be able to read to learn. Oganya [33] opined that reading is a tool to acknowledge in all human endeavors and a key to successful learning and communication. Language (reading) is used as a medium of instruction in schools and communication in all areas of civil service and at the same time the foundation of other aspects of school. Mynard (1999) stresses that the most important skills any child can leave primary school with are the abilities to read independently and effectively for meaning. Consequently, reading should be the biggest priority goal of primary schools.

It is important for children with dyslexia to acquire the necessary skills and knowledge of reading and the way forward in assisting these children is to identify those who are at risk of dyslexia very early and give them intervention on phonological awareness skills training. The International Dyslexia Association [20,21] emphasizes that without appropriate intervention, dyslexics have a higher probability of not completing primary schools. Their dreams are shattered and opportunities are lost. However, studies reveal that with appropriate interventions, children with dyslexia can overcome, to some extent, their reading and writing, spelling and mathematical problems. Intervention on reading performance of dyslexics is best by a sustained course of proper instruction in reading. On this basis, the study identified and gave intervention to dyslexics children on phonological awareness skills.

1.1. Theoretical Framework

There are many dominant theories of dyslexia. One of the dominant theories in the field of dyslexia research is the phonological deficit hypothesis which claims that phonological deficits in the representation and processing of speech sounds are the direct cause of reading impairment [40]. Some researchers contend that the role of phonological deficits is to mediate between other cognitive skills (auditory perception, [45]) and impaired reading, whereas others propose that attentional deficits, which are dissociated from phonological deficits, are the cause of reading impairment [52]. However, out of the range of phonological processing deficits, the impairment of phonological awareness has been regarded as the major cause of developmental dyslexia [51]. Hence, the present study investigated the effects of phonological awareness training on the reading performance of children with dyslexia in primary schools in Maiduguri Metropolis, Borno State, Nigeria.

The study is hinged on the phonological deficit theory propounded by Morgan [26]. The theory postulates that dyslexia is a congenial dysfunction of the left hemisphere, Pennsylvanian brain area, underlying phonological representation or connecting between phonological and orthographical representation. Thus dyslexia can cause specific impairment in representation, storage and retrieval

of speech sound. Learning to read an alphabet system requires the grapheme/ phoneme correspondent. That is correspondence between letters and constituent sound speeches. Hence, if the sounds are poorly represented, stored or retrieved, the learning of graphemes/phonemes correspondence, which is the foundation of reading phonic methods for alphabet system, would be affected. Thus, due to brain malfunctioning, dyslexics have difficulty in segmenting words. For example, sunshine can be segmented as sunshine or when the 'shine' is deleted, sun can stand as a word and shine as a word. As a result, lack of adequate phonological awareness has been associated with dyslexia. Furthermore, the theory postulates that people with dyslexia have specific sound manipulation impairment which affects their auditory, memory, word recall, and sounds association skills when processing speech.

Phonological awareness training programme has been used to give intervention in different cultures to improved the reading ability of people with dyslexia with significant success. For example, De Jong and Van Der Leij [12] gave phonological awareness intervention to dyslexics and reported that the impact of phoneme awareness on Dutch dyslexic readers persisted throughout the end of fourth grade. Caravolas, Volin & Hulme [7] compared the importance of phoneme awareness in the reading development of English and Czech children with dyslexia in a cross-linguistic study, (the latter learning an orthography that is more consistent than the German orthography). They found significant deficits of phoneme awareness for both groups of English and Czech children at least up to the fifth grade [7].

Neumann, Ermingen-Marbach, Grande, Willmes and Heim, [31] investigated the effectiveness of phonological awareness training in improving reading in German children with dyslexia in the third and fourth graders who have phonological awareness deficit, and whether the children could equally benefit from a phonology-based reading training or a visually-based reading training. They used a sample of 30 children and a total of 20 training sessions (30 minutes each) distributed over four weeks. They found that phonological awareness training significantly improved directly reading comprehension in German children with dyslexic having phonological awareness deficit and that the children equally benefited from a visually-based reading training.

Layes and Mohamed [22] examined the effects of a phonological awareness training program on word reading and pseudo-word decoding in reading of children with dyslexia in the Arabic languages from grades 4 and 5. Particular attention was paid to phonological training of two metalinguistic reading related skills: morphological awareness (MA) and rapid automatized naming (RAN). They focused the phonological awareness training programme on phoneme/syllable identification, phoneme matching, and word segmentation. They reported that the phonological awareness training program significantly improved the reading, phonological processing and metalinguistic-related skills of the dyslexics.

1.2. Gender Difference Phonological Awareness of Children with Dyslexia

Dyslexia is said to be three times more common in boys than in girls and usually becomes evident in the early

school years. The disorder tends to run in families. Only a minority of dyslexics remains nonreaders into adulthood, but many dyslexics continue to read and spell poorly throughout their lifetime. Dyslexics frequently perform above average on nonverbal tests of intelligence. Research studies have established that the rate of dyslexia is much higher in boys than girls Nass [27,29]. International Dyslexia Association [20,21] and Neurological Disorder and Stroke [28] showed that dyslexia is two to three times more prevalent among males than females. The ratio of dyslexia shows that 7.6% males are dyslexic while 3.4% are female. Nass [27,29] reported that the prevalence of reading difficulties is typically higher in fifteen children who are dyslexic 7 were females. This shows that in the study area, the rate of dyslexic is also high among female children. However, to explore the possible gender difference in reading, conducted twin pair study on 1133 children which at least one member of each pair had a school history of reading problem, and 684 have no reading difficulties. The result showed the difference between the mean scores of the two groups (1, 3624) =141582, $p < 0.001$, $n^2 0.28$.

Ruther [37] also reported gender ratio in four independent epidemiological studies in which the samples had been ascertained using research criteria. In all of the four studies, more males significantly differ from females with reading difficulties. Several biological and environmental hypotheses have been proposed to account for these gender differences at prevalent rates including X-linked, recessive inheritance difference in brain functioning due to differential exposure or sensitivity to androgens [44]; immunological factors, sex imprinting, pre-natal complications and differential resilience. It was found that females are less vulnerable to environmental factors such as teaching method and socio-economic difficulties among females than males. According to Georgetown University news release (May 8, 2013), it was found that male and female brains function differently. Female brain processes reading differently and there is sex specific variance in brain anatomy of males and females. Females tend to use both hemispheres for language tasks while males use just the 'left'. More so, sex hormones are brain injury.

1.3. Context of the Study

Borno states is one of the educationally backward and disadvantage state in Nigeria. English language is used as the medium at all levels of our education. It is compulsory for students to obtain credit in English and Mathematics at the end of their secondary school education among the five credit requirement for entry into tertiary institution. Hence, every child needs solid foundation in literacy for the purposes of communication and for understanding written material in all subjects. Many students have been denied admission into tertiary institutions, despite the fact that they made five credits in other subjects, due to poor performance in English Language. There are many pupils who are performing very poorly in English Language in primary school, where the foundation for sound literacy should be laid, despite the seemingly conducive environment for leaning of language and their non relenting effort in learning. Such pupils are usually labelled as lazy, stupid, and unintelligent by teachers,

parents, siblings and even their peers. Many of such pupils have dropped out of schools out of frustration. Literature reveals that pupils can perform poorly in Language due to learning difficulty called dyslexia and that if they are given early intervention, they can improve their reading abilities, overcome the difficulties and cope with their education. Most the literature reviewed on intervention for dyslexia are carried out in western world and other places with non around Borno State, Nigeria. It is necessary therefore to identify such pupils and give them intervention to help them overcome their reading problem and cope with their education. Hence the present study.

1.4. Purpose of the Study

The purposes of the study were to: identify dyslexic children in primary school, determine their reading levels and give them intervention (training in phonological awareness skills) so as to improve their reading performance, as well as to determine the effect of sex on the intervention.

1.5. Research Question and Hypotheses

1. What are the reading levels of dyslexic children before and after intervention?

Ho₁ There is no significant effect of training in phonological awareness skills on the reading performance of children with dyslexic.

Ho₂ There is no significant effect of sex on the training in the phonological awareness skills on the reading performance of dyslexic children.

2. Materials and Method

2.1. Participants

Quasi-experimental method (pre-test and post-test) was the design of the study. A sample of 15 children with dyslexia (8 boys and 7 girls) from primary two, selected using purposive sampling technique, participated in the study. Dyslexia Identification Questionnaire (DIQ) developed by Davies [11] was modified and used to select the sample students. The instrument consists of Dyslexia Common Characteristics. It has 41 items (characteristics) commonly exhibited by dyslexic individuals. However, the researchers modified it to 20 items, which specifically targeted the phonological reading aspect of dyslexia. The predictors were rated on 5 points likert scale –Strongly Agreed (SA) 5 points, Agree (A) 4 points, Disagree (DA) 3 points, Strongly Disagree (SD) 2 points and Undecided (UD) 1 point. It gives a maximum score of 100%. Accordingly, a score of 0- 40 marks on the characteristics indicates that the child is not a dyslexia suspect; a score of 41-69 is an indication that the child is at risk of dyslexia and a score of 70 marks and above indicated that the child is dyslexic and requires dyslexia intervention training. Teachers were used as assistants in administering the questionnaire. They were given full instruction on how to tick the questionnaire in respect of every child in the class.

2.2. Instrument

Two instruments were used to collect the data. Reading passage called 'Cloze Test' was used to measure the

pre-intervention and post intervention reading performance levels of the children with dyslexic while 'Phonological Awareness Skills Test' (PAST) was used to give phonological awareness training in four reading skills. Phonological awareness training refers to any practice targeting young children's phonological awareness abilities Robertson [35] developed the PAST for training dyslexic persons on phonological skills that will help to improve their reading. It assesses students' awareness of the oral language segments that comprises words, syllables and phonemes. It is comprehensive and involves a wide variety of tasks. It has sub-tests including rhyming words, syllable blending, words segmentation, syllable deletion, words discrimination and words production. The instrument has a Cornbach Alpha Coefficient reliability index of 0.95. The researchers adapted it because it has been correlated with success and plans for effective interventions. However, four of the six sub-tests measuring four phonological awareness skills namely, word identification (recognition), word deletion, word blending and word rhyming instead of all the six sub-tests were used for the study. Word segmentation and word discrimination were dropped because they are suitable for higher levels of students. Each of the skills has 10 items, which the participants were assessed on.

To measure the reading levels of the dyslexics, an extracted passage in English Language Text Book 2 was used. The test is called 'Cloze Test'. The test reveals the interplay between the prior knowledge that children bring to the reading tasks and their language competence. To determine the reading level, each of the correct 50 words extracted to test children for effective individualized instructions is scored 2. That is, $50 \times 2 = 100\%$ marks. A score of 30 % and below means the child's level of reading is at the frustration level, a score of 31%-59 % is described as instructional level meaning, and the child can read simple words in a text. A score of 60 % and above is independent level. It means the child can read on his own [2].

The instruments were validated by experts in the field of Measurement and Evaluation, English language teachers and specialists in areas of learning difficulties in some other institutions. As part of the validation, a pilot study was conducted to determine whether the instrument was appropriate for the study. Cohen and Minion [10] states that, the essence of pilot testing is to provide earlier information and permit a thorough check of the planned statistical procedures. The instrument was found to have Alpha Coefficient reliability index of 0.87 which was considered appropriate for the study.

2.3. Procedure

The researchers sought for informed consent of the pupils to participate in the study first from the Local Education Authority (LEA) where permission to conduct the study in the school was sought for and a letter of introduction and permission to conduct the research in the school was obtained and given to the head teacher. Inform consent was sought from the parents through the Head teacher, who informed parents through their wards, that such study was going to be conducted with pupils in his/her school and that any parent that would like his child to participate should indicate his/her objection either by

coming to the school to explain why or put it in writing for his word to bring it to the school. Lastly informed consent was sought from the pupils by explaining the research to them and telling them that anyone who do not want to participate should raise his hand. At each stage, the purpose of the study was clearly explained as well as the issue of confidentiality and dissemination of results of the study.

In the first phase of the intervention, a pre-test Cloze Test was administered to the pupils to determine their reading levels. In the second to the fifth stages of the experiment, a phonological awareness training in the four reading skills were given, each for a period of two weeks with four time (days) meetings per week in the following order: word identification (recognition), word deletion, word blending and word rhyming. Each of the training session lasted for 30 minutes. The training lasted for 8 weeks. After the training in each of the skills, the participants were tested in their awareness of the skills. In

the phase 6 of the intervention, the dyslexics were given a post test reading to determine their reading levels.

2.4. Method of Data Analysis

The data collected were analysed using descriptive statistics (mean, standard deviation, frequency count and percentage) to measure pre-test and post-test reading levels of the dyslexics, while t-test was used to measure the effect of the phonological awareness training skills on the reading performance of the dyslexic children as well as the effect of sex on the intervention. The hypotheses were tested at 0.05 levels of significant.

3. Results

The results of the study are presented in tables below followed by their interpretations.

Table 1. Pre-Test and Post-Test Reading Levels of the Dyslexics

S/No	Pre-test reading (scores %)	Description: Levels	Post- test reading levels (Score %)	Description: Levels
1	24	Frustration	40	Instructional
2	10	Frustration	30	Frustration
3	24	Frustration	30	Frustration
4	12	Frustration	36	Instructional
5	10	Frustration	36	Instructional
6	26	Frustration	32	Instructional
7	32	Instructional	46	Instructional
8	10	Frustration	32	Instructional
9	36	Instructional	48	Instructional
10	10	Frustration	28	Frustration
11	12	Frustration	44	Instructional
12	20	Frustration	46	Instructional
13	12	Frustration	40	Instructional
14	12	Frustration	32	Instructional
15	12	Frustration	32	Instructional
16	64*	Independent		
17	62*	Independent		
18	64*	Independent		
19	60*	Independent		
20	60*	Independent		

*N 20.

*Those who read at an independent level at the pre-test. They were exempted from the study.

Cloze Test was used to determine the reading levels of the dyslexic children at pre-test and post-test. The results on Table 1 reveals that out of the 20 selected dyslexics with the used of DIQ, 5 read at an independent level (scored 60%-64%) and were exempted from the training.

After the training, even though all the dyslexics improved in their reading to some extent (scored 28% - 48%) out of 13 whose reading were at frustration level, 11 had their reading level improved to instructional level (Post test scores 32% to 48%) while two still remained at

frustration level (Post-test scores 28%-30%). The two whose pre-test reading levels were at instructional level, still remained at the instructional level even though there was increase in their post- test reading scores. Thus, none of the dyslexics was able to acquire an independent reading level.

With this little improvement seen in the scores of the all the dyslexic, there is hope that with longing period of training and time devoted to training in PAST, dyslexics children can improve their reading performance.

Table 2. Effect of The Training In Phonological Awareness Test on The Reading Performance of The Dyslexic Children

Variables	N	M	Sd	Df	t	Sig
Pre-reading test		7.93	4.182			
	15			14	-9.615	.000
Post-reading test		16.93	5.68			

In Table 2, a paired sample t-test was used to determine the effects of the training in phonological awareness skills in facilitating reading of dyslexic children. The results on Table 2 revealed that training in phonological awareness

skills has a significant effects on the reading performance of dyslexics $t = -9.615$, $p \leq .000$, $df 14$, pre-test mean = 7.93, $Sd = 4.183$ while the mean for the post-reading is 16.93, $SD = 5.6$. This means that training in the four

phonological awareness skills, (word identification (recognition), word deletion, and word blending and word rhyming.) improved the reading performance of the dyslexic.

The results for the effects of sex on the intervention on reading performance of the dyslexic children is presented on the [Table 3](#).

Table 3. Effect of Sex on the Training in Phonological Awareness skills on Reading Performance of Dyslexic Children

Variables	Sex	Mean	Sd	df	t	Sig.
Pre-test reading	Boys	6.63	2.264			
				13	-1.330	.206
Pre-test reading	Girls	9.43	5.47			
Post-test reading	Boys	4.25	1.165			
				13	-.217	.832
Post-test reading	Girls	2.71	2.360			

N (Boys = 8, Girls = 7) 15.

In determining whether there is significant effect of sex on the intervention on the reading performance of the dyslexic, the pre- test and post-test reading performance of boys and girls with were compared. The pre-test results on [Table 3](#) revealed that there is no statistical significant difference in the reading performance of boys and girls at .p.05 level, $t = 1.330$, $P = .206$, $df = 13$. Boys' $M = 6.63$, $SD = 2.264$, while that of girls is $M = 9.43$, $SD = 5.47$. Similarly, the post test reading performance for boys and girls is not statistically significant at $p = .05$, $t = -.217$, $p = .832$ $df = 13$. Boys' $M = 4.25$, $SD = 1.165$, and girls' $M = 2.71$, $SD = 2.360$. Thus, the result revealed that there is no statistical significant effect of sex on phonological awareness skills training on reading performance of children with dyslexics in Maiduguri Metropolis.

4. Discussion

The pre-test reading level of the dyslexics, who were selected with the DIQ, as measured with the cloze test showed that five read at independent level, 2 read at instructional level and 13 read at frustration level meaning that they had extreme difficulties learning to read. This means that the cloze test is a good tool in discriminating between real potential children at risk of dyslexic from children having problems of reading which is not due to learning difficulties. The finding corroborates Andzayi's [2] findings that a close encounter with cloze test should reveal the interplay between the children's reading and language competence. The use of the cloze test therefore enables the researchers to determine the effectiveness of the application of the test.

The results further revealed that out of the fifteen dyslexics who participated in the training, four of the dyslexics' reading performance remained at the same level: two at a frustration level and two at an instruction level. Eleven had their reading improved from frustration level to instructional level after the PAST. This supports the reports of previous studies [15,22,31,46], that there was improvement in the reading levels of dyslexics after intervention; that the intervention group made ratio gain of 4:56 in word reading, 8:82 on pseudo word reading and 1.09 on spelling over five weeks of intervention (total instruction 40 hours) Frost and Sorensen [15], Torgesen, [46]. The intervention given in this study lasted for 8

weeks with a total of 16 hours of instruction (30 minutes x 4 contacts per week x 8 weeks). With the improvement in the reading levels of the 11 dyslexics from frustration to instructional level as well as with the little improvement in the score of those whose reading performance still remained at the frustration and instructional levels, the researchers as optimistic that if they were given longer session of contacts in the 8 weeks of the intervention, their reading levels could have improved to instructional level while those whose reading level improved to instructional levels might have reached an independent reading level. Based on these performances, the dyslexics were expected to gradually begin to cope with their reading activities in the class. It is the most important skill a child must acquire at school in order to make educational advancement. Since reading is central to all forms of learning, every effort should be made to by teacher and parents to sustain the achievement made by the children from the training intervention.

The results of the pre and post test reading performance of the dyslexics after the intervention revealed that there is significant effect of the training in the phonological awareness skills on the reading performance of the dyslexics. This finding concurs with Torgesen, Wagner and Rashotte, [49]; Hogan, Catts, and Little [18] that phonological awareness skills is a powerful predictor of reading and spelling in early school years. Similarly, the findings is in agreement with Schneider, Roth and Ennemoser [39], who used syllable deletion and word segmentation training in fostering reading among dyslexic children. Their findings revealed that the children with dyslexic who were trained in syllable deletion and word segmentation out-performed all other dyslexic children not trained on these phonological skills when related to reading. The finding also corroborates Bryne, Fielding and Brantley [6], and O'Canner's [32] findings that there is significant effect of training in phonological awareness on children's ability to decode words. Stonovich (1986) and Adams [1]'s conclusion from the findings of their studies that syllable deletion is one of the important early skills for learning to read and that failure to acquire this skill leads to reading difficulties in both young children and adults.

The results of the study that there is significant effect of the PA training in the four phonological skills: word identification, syllable blending, syllable deletion and word rhyming on reading performance supports two major suppositions. First, is that findings from correlational studies which indicated that young children's phonological sensitivity is related to later development of reading skills. Warrick and Lonigan [54] validated early screening of phonological sensitivity to identify children who may be at risk of reading difficulties. Second, experimental studies of the effectiveness of phonological awareness training revealed that young children's phonological awareness can be promoted, thereby altering patterns of initial weaknesses [5,32,48,53].

However, the study did not support the findings of, O'Connor, Slocum and Jenkins [32] that there is no significant effect of training on phonological awareness skills on reading performance of children. With dyslexia They carried out a study on phonological awareness skills on 268 kindergarten children. The study examined the effects of two variations of phonological awareness

instructions: phoneme blending and segmenting. Sixty-seven children were randomly selected for the low-skilled experimental group based on pretest scores of 0 – 30% on two phonological sub-tests, blending and segmenting single-syllable words from and into onset-rime. The results showed that the post-intervention scores of treated and control groups on measures of phonological awareness did not differ significantly. Among blending, segmenting, rhyme production, rapid letter naming, and syllable deletion; only blending and segmenting yielded significant differences. Both treatment groups outperformed the controlled groups on measures of blending and segmenting. However, the treatment groups did not differ from each other. Although the present study has no control group, the dyslexics trained in the phonological awareness skills showed significant improvement in their reading.

The differences in the findings could be attributable to one or all of the following: differences in the ages of the participants - kindergarten children as against primary school children; sample size - 67 kindergarten children as against 15 primary schools children, and lastly method of the study - the previous study used both experiment and controlled group and also compared the pre and post test awareness performance on the phonological skills whereas the present study did not use control group nor compared the pre and post awareness skills on the segment of the skills trained.

It is found that there is no significant effect of sex on the intervention. Boys and girls did not differ significantly on their reading performance at the pre-test and post-test reading performance. This is contrary to the report of previous studies. Nass [27,29], International Dyslexia Association [20,21] and National Institute of Neurological Disorders and Stroke [28] reported that the prevalence of reading difficulties is typically higher in males than females in both referred and research, a ratio of 7.6% male and 3.8% female in relation to Nass [27,29]. Melgosa [25] and Georgetown University News release (May 8, 2013) reported that dyslexia is more pronounced among males than females.

5. Conclusion

Based on the findings of this study, it is concluded that training in phonological awareness skills has significant effects in improving the reading ability and performance of children with dyslexia. The findings of the study are very significant to teachers, parents, government and school proprietors that not all children who could not read are either slow learners or lack sound background in reading. But that some of such children have learning difficulties which proper intervention can curb their problems. The study equally concludes that there is no significant effect of sex on the reading performance of the dyslexic children.

5.1. Limitation of the Study

The study should have tested the reading level of the dyslexics at the end of each treatment on a phonological skills which would have enabled teasing out which is the most significant phonological awareness among the four skills in improving reading performance of dyslexics.

Secondly, the recommended period of the intervention is 40 minutes training five times a week for 12 weeks. But this study could not do that due to restriction from the school. Hence, it made do with the number of days per week and time given to it for each contact by the school. Further studies may choose to include a step by step measuring of the effect of each segment of the phonological awareness skills on the reading performance, and increase the duration and days of contact for the intervention for a better result that will tease out the effectiveness of the PAST.

5.2. Recommendations

Based on the findings of this study, the following recommendations were made. Education authorities like the Universal Basic Education (UBE) and Local Education Authorities (L.E.A), State and Federal Ministries of Education, should train and employ specialists in the area of learning difficulties to primary schools who will help in regular screening to identify children who are at risk of dyslexia so as to provide early intervention.

Stakeholders in the Education industry like the Federal Ministry of Education, State Ministries of Education, Teaching Service Board, Local Education Authorities, and Universal Basic Education (UBE) and proprietors of schools should organize routine workshops, seminars or conferences to inform and educate teachers and parents on the need for early identification and intervention for children at risks of dyslexia.

The training in phonological awareness has revealed that it is significant in improving the reading performance of the dyslexics. Universities and colleges of education should give students specializing in English Language training in handling children with dyslexia to enable them identify and handle their need in their teaching in view of the move towards inclusive education. Since sex is not a barrier to acquiring reading skills, both male and female dyslexics should be encouraged to participate actively in intervention programmes that will help overcome their reading difficulties.

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