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Research Article

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The effectiveness of storytelling on improving auditory memory of students with reading disabilities in Marivan city

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ABSTRACT

Introduction and purpose*: Students with learning disabilities often encounter problems with their lessons due to the disorder in reading and writing. The students face to a challenging situation and environment such as auditory and visual memory problem, sustaining attention, inhibiting impulses, motor coordination, auditory and visual perception and discrimination, learning style, and hyperactive and restless after entering school. The purpose of this study was the effectiveness of storytelling on auditory memory of students with reading disabilities of Marivan city in 2015.* ***Materials and methods****: The research method was quasi-experimental with pretest-posttest design with a control group. Sampling method was replaced in this study using an available sampling method in two groups (15 experimental and 15 control people). The experimental group test abilities were trained in 12 sessions. Digit span subtest the Wechsler figures Fourth Edition were used to collect data. Collected data were analyzed by using SPSS21 software in two levels of descriptive and inferential statistics (ANCOVA).* ***Results****: The results showed that storytelling had a significant impact on improving dyslexic students' auditory memory. The value of F-test was 4.383 for interaction of auditory memory of students with dyslexia in groups and the significant level was also $p<0.05$ (0.046).* ***Conclusion****: Auditory processing is not only a skill, but it also includes a combination of skills that are basic to the processes of listening, communicating and learning, as well as higher level skills such as synthesis and integration of auditory and auditory memory which rely on healthy auditory processing system. The results of this study confirmed the effectiveness of storytelling on the aural memory.*

Key words: *storytelling, auditory memory, dyslexia*

INTRODUCTION

Dyslexia is a term that is used for children that are not able to read the contents correctly despite the normal IQ and adequate training [1]. Learning disorders are mostly detected in the stage of entering the school and after that, though some symptoms may be observed in children before the age of primary school [2] . Many children are facing with learning difficulties at school and this sometimes leads to academic failure and school dropout. In this group, despite the fact that in most cases they have normal intelligence, cannot have good academic achievement and they difficulty continue their education or drop out of school; in turn, this has consequences such as social, economic, cultural and emotional-psychological damages for them and society. Students with learning disabilities encounter problems because of impaired reading and writing or calculations of their lessons [3] .

These children have no problem in hearing or sharp-audio, but their inability in the audio comprehension, recognition's ability, or interpretation of the heard materials. Because listening comprehension abilities would have been created during the early years of growth, many school teachers mistakenly thought that all students enjoy these

skills; auditory perception skills include phonemes, auditory discrimination language, auditory memory, auditory sequence, and auditory combination [4].

So the memory forms one of the foundations of learning, thinking, creativity, planning and our everyday behavior. Methods and techniques that can improve memory are very important; in the meantime, storytelling is one of the innovative techniques used recently to strengthen memory. Employing the storytelling technique has recently been considered by many researchers in the treatment of learning disorder. Researchers have used children's storytelling ability to evaluate and assess their different problems and abilities; for example Gutierrez-Koln and Decortiz [5] have considered the analysis of children's stories as an appropriate method for assessing language skills. Storytelling as a collective game is a tool to strengthen senses, and mental faculties and social development of children in the learning process; so it can eliminate the memory problems [6].

Central auditory processing disorder is sensory disorder which usually makes problem the listening skills, learning and understanding the language; and it occurs when the ear and brain are not fully coordinated with each other. Sensory system (here, the ear) correctly receive speech, but the parts of the brain, which analyze and interpret these data, do not function properly. This disorder caused by a deficiency in one or more central auditory processes that produce auditory evoked potentials and their subsequent behaviors. In fact, auditory processing is what we hear and how we behave. This is not only hearing the audio signal, but it is its collective with visual data and other sensory and important inputs of voice message. Central processing disorder is when a person is unable to take full advantage of the heard signal [7].

Music and Chermak [8] stated that auditory processing disorder is usually a benign problem in children, and its base is often a cortical/subcortical disruption that may arise after the delay mature or morphological abnormalities. The real reason of auditory processing problem of children has never identified in most cases. It is not clear whether the disorder is a deviation from the normality or something like a brain injury? But often there are subtle microscopic differences in the structure of the central nervous system in these people, especially in the receiving time area in the left hemisphere and visual-spatial area in the right hemisphere compared to the normal people. In general, it is more appropriate to consider the problem as a defect not a disease [9]. Some dyslexics are less able to distinguish the non-speech sounds with different frequency range (i.e. frequency difference) even when the sounds are slowly received [10].

Sharma et al. [11] reported the problem in 65% cases. Only subgroup of people with dyslexia showed problems with rapid auditory processing or frequency's distinction. Some researchers have been in favor of particular speech hypothesis in which dyslexia is caused by problems in encoding the language; some have problems of processing simple speech sounds (consonant-vowel or vowels), though their ability is apparently not damaged to process similar non-speech sounds. The ability is important to learn language and reading skills and its deficiency may lead to impaired language skills, including reading. 23 percent and 18 percent of dyslexia, respectively, have poor performance to distinguish vowel and vowel-consonant. Researches in the field of neurological dysfunction of dyslexia suggest that phonological problems may result from more fundamental deficiencies in basic cognitive mechanisms that are responsible for processing auditory time information. Time differentiation or low frequency can be justification for weak distinguishing speech sounds. Weak speech perception creates vague phonological representations due to auditory processing deficits that cause the awareness phonological defects. Phonological deficit hypothesis is the leading cause of the disorder in reading.

Lerner [4] suggests storytelling as an approach to help students with learning difficulties to help them to understand themselves and their problems. Lerner believes that, in the process, students acquire skills with modeling story's characters in encountering similar problems; stories can lead to changes in their attitudes towards themselves because awareness of pleasant and unpleasant experiences of others causes to release from suffering and increases the hope. Children learn effective strategies via assimilating a fictional character who is confronted with the problem. According to the researches which have been conducted about the effectiveness of non-pharmacological and psychological treatments on memory as well as supporting the research results related to the role of auditory memory in learning and the difference in the performance between students with learning disabilities and normal children in auditory memory task, it can be said that if the cognitive strategies such as storytelling is effective, this methods can be used as an effective effort to improve the conditions of the children in schools with the lowest cost. In other words, the results can be considered as a tool to help students with learning disabilities, especially to increase the auditory memory by administrators, teachers, and parents.

Some researches that have been conducted in this area are like Alikhani et al. [12] research that revealed a significant difference between the experimental and control groups in the rate of improvement of auditory discrimination. As well as the research of Taghizadeh et al. [13] demonstrated that the auditory and visual working memory's performance is improved in children of school by increasing age which shows the related functional maturation of cognitive processes and brain structures. Jakivline et al. [14] in the study of auditory memory showed that failure in the auditory peripheral is mostly the result of a defective system of input and stored data in memory. Andrea et al. [15] in examining the impact of multi-sensory storytelling to support the learning of people with intellectual disability in an educational-exploratory study showed that the use of multi-sensory contents are effective in improving intellectual disability. The results of Marina [16] used storytelling as a constructive paradigm. The results showed that children enjoy interacting with the robot in storytelling, as well as the benefits of combination of SAR type is effective in pre-school education. Research by Keoch and Hebbel [17] showed that children with specific learning impairments are experiencing difficulties in assignments related to the hearing in both ears and tasks that require the hearing attention.

Miller and Penikaf [18] concluded that storytelling is an effective strategy and it includes the beauty ways to understand tutorial. In addition, it develops students' performance in reading and writing. Mahmoudi [19] found that storytelling as a class activity has been effective to enhance the ability of listening comprehension in language learners.

2. Methodology

The research method of the present study was applicable in terms of purpose, and it was semi-experimental in the type of pretest-posttest with control group. Independent variable was storytelling and the dependent variable was auditory memory. The study population consisted of all elementary school students with learning disabilities in reading from the city of Marivan that the students were enrolled in the academic year 2015-2016. According to official statistics, this center had 150 male and female students. Inclusion criteria for students were: having learning disability (dyslexia only), third grade of primary school, not having associated disorders. Exclusion criteria as well as for students were: Students who did not attend the sessions regularly and students who did not recite the given assignments (fiction) to the families at home. To select sample size, first, after visiting the center of learning disability and identifying the third grade students (according to gender and school), 30 students were chosen purposefully. Then, 15 students in the experimental group and 15 students in the control group were statistically selected by alternative sampling method. Collecting the data tool was the subtest of Wechsler auditory memory in this study. The auditory memory of children older than two years is measured with the test in the production of continuous, accurate, and reloading string of numbers and words which they hear. The test consists of a list of numbers that its numbers are gradually increased. Examiner counts each batch of numbers with precision and states the right time (one second for each word and number) for the participants; and the participant should recite the words and the numbers and put positive sign into the opposite column and put negative sign if he/she fails. After two consecutive negative sign, the test is stopped and the number of last positive words is recorded as the number of words which a child can remember and express them; after finishing the direct numbers, reverse numbers are also performed like that [20].

The subtest is provided for children 6 to 16 years old. This test has been adapted and standardized by Abedi, Sadeghi and Rabiei [21] on a sample of Iranian children. Subtests' reliability has been reported in the retest ranging from 0.65 to 0.95 and split-half coefficients from 0.86 to 0.71.

3. Performing procedure

Participants were selected randomly after coordination with centers of learning disorder. Before beginning intervention in the experimental group, both groups were evaluated in a meeting with the tested research tools (pre-test); and after finishing intervention in both groups (control and experimental groups) were again evaluated in a separate meeting with the research tools (post-test). For non-interference of independent variable in the control group, participants of the experimental group were asked to teach only their family what they learnt and they must not define elsewhere. In the first session, necessary justifications were explained for implementing intervention and the benefits and objectives of the intervention; and rules were formally recorded on the boards; stories are selected in such a way that the words were used with closely phonemes to each other such as "d, t" etc. Storytelling was presented in the Green style [22]. That is, after submitting stories to children, the meeting was ended with finishing the story, and no question was asked about the story. In fact, the children were allowed to leave the meeting with

their own thoughts; the privacy of children does not be invaded according to Greene [22]; of course, the children were asked to tell stories to two members of the family. In subsequent meetings, storyteller told the summary of previous stories and one of the participants said a summary of the story of the previous meeting. The duration of each session was 20 to 30 minutes according to the story. In all the stories, sentences were uttered in such a way that the phonemes had a lot denominator and observed frequent repetition in them with the aim of strengthening students' auditory memory. At the end, the post-test was taken from both groups.

4. Results

Descriptive results

The average was 8.000 and 8.533, respectively, in dyslexic students of both the experimental and control groups before intervention in the auditory memory variable. As well as the mean of the two groups after intervention in auditory memory was equal to 11.000 and 10.066, respectively. It can be said that storytelling has been effective on dyslexia students' auditory memory due to the increase in the average of two groups after intervention.

Table 1. Mean and standard deviation of scores of auditory memory in both control and experimental groups

Variable	Group	Number	Pre-test	Post-test
			Mean ± standard deviation	Mean ± standard deviation
Auditory memory	Experimental	15	8.000 ± 0.925	11.000 ± 1.732
	Control	15	8.533 ± 1.125	10.066 ± 1.222

Storytelling is effective on improving the auditory memory in dyslexic students.

Table 2. The result of Levene test

Variable	F-test value	df1	df2	Significance level
Auditory memory	3.726	1	28	0.065

In the table above, the post-test average of experimental group is compared with the control group and pre-test scores were used as an auxiliary variable. According to the amount of F= 3.726 and being larger the level of significance in Levene test than 0.05%, it can be said that the homogeneity hypothesis has been met in post-test.

Table 3. Homogeneity test of the regression slope

Changes' source	Sum of squares	Degree of freedom	Mean of squares	F-test value	Significance level
Modified model	12.463	2	6.231	2.951	0.069
Constant value	20.439	1	20.439	9.681	P<0.00
Test factor * Groups	12.463	2	6.231	2.951	0.069
Error	57.004	27	2.111		
Total	3398.000	30			

As seen in the above table, interaction between group and pre-test of auditory memory is not significant. In other words, the data support the homogeneity hypothesis of regression slopes (P=0.069 and F=2.951). So it can be stated that the regression slope is homogeneous. And the assumption of homogeneity of the slope of the regression line is met. Therefore, the default of analysis test of covariance is realized for auditory memory.

Table 4. Univariate covariance test for the impact of storytelling on improving auditory memory in dyslexic students

Changes' source	Sum of squares	Degree of freedom	Mean of squares	F-test value	Significance level
Modified model	11.760	2	5.880	2.751	0.082
Constant value	21.421	1	21.421	10.022	P<0.00
Auditory memory	5.227	1	5.227	2.446	0.129
Groups	9.367	1	9.367	4.383	P<0.05

Error	57.706	27	2.137
Total	3398.000	30	

As shown in the above table, F-test value was 10.022 for storytelling impact on auditory memory of dyslexic students and its significant level was p<0.00. So it can be stated that with the error probability of 1%, the effect of storytelling on auditory memory of students with dyslexia is significantly enhanced. The F-test value was also 4.383 for interaction of auditory memory of dyslexic students in groups and its significance level was 0.046 in p<0.05. Therefore, with the error probability of 5%, it can be stated that storytelling interaction has a significant effect on auditory memory in dyslexic students.

5. Discussion

Storytelling like a collective game is a means to strengthen senses and mental faculties and social development of children in the learning process. Therefore, it can eliminate the memory problems acceptably. Storytelling prepares the way for comprehension by providing questions and answers atmosphere and helps memory to strengthen the encoding; all of these are possible through listening to the storyteller. So storytelling is an inhibitory factor for memory problems and is a tool to eliminate the weakness of accountability to assignments. Stories act such as video games when are provided as the musical stories and images that are actions to improve memory, concentration, and executive management [23].

In the present study, there was not any significant difference between the mean score of intervention and control groups before holding the sessions for students with dyslexia, but the difference was significant after holding classes for participants, which the mean of post-test of experimental group was compared with the control group and pre-test scores were used as an auxiliary variable. Significant difference was 10.022 for storytelling impact on auditory memory of dyslexic students, as well as its significant level was equal to p<0.00. So with the error probability of 1%, it can be said that this has significantly enhanced the effect of storytelling on auditory memory of dyslexic students and this result can be generalized to the statistical population. As well as the F-test value was 4.383 for interaction of auditory memory of dyslexic students in groups and its significance level was 0.046 in p<0.05. Therefore, with the error probability of 5%, it can be stated that storytelling interaction has a significant effect on auditory memory in students with dyslexia. In line with the results of this hypothesis, Vali [24] study can be pointed out that its result was that the impact of storytelling was more than simple lecturing on increasing medical students' knowledge. Therefore, it is recommended to use this method for teaching the rare and genetic diseases.

As well as the results of Shamsian [25] on the (center) auditory processing disorder in speech-language pathology showed that auditory processing is a complex process and speech-language pathologists play an important role in screening, differential diagnosis, and treatment of people with APD (C); and the professionals should especially considered APD (C) when there are learning or attention problems in school children. Another study which is consistent with the results of this hypothesis is the study of Sarli et al. [29], that in the impact of computer-based auditory task training on sustained attention in children with attention deficit/hyperactivity showed that auditory practices in comparison with the control group could significantly reduce visual and auditory sustained attention deficiency in children with attention deficit along with hyperactivity.

The results of Wauters [26] revealed that despite the word recognition of hearing impaired children is roughly equal with hearing counterparts; their reading comprehension scores are much lower than hearing children. Nikravesh and Aghajanzadeh [27] assessed auditory processing in children with language-specific damage that the results showed that abnormalities can be observed in auditory processing of children with language-specific damage. These children also have differences in function and anatomy of parts of central auditory nervous system towards their peers that show that the auditory processing disorders may be the cause of SLI. It is also possible to mention the study of Marina [16] that in this study, storytelling was used as a manufacturing paradigm. The results showed that children enjoy interacting with the robot in storytelling, as well as the benefits of combination of SAR type is effective in pre-school education.

6- Conclusion

Given the impact of the intervention that was took place in this study, it can be concluded that storytelling is effective on improving auditory memory in dyslexic students. From this, we can conclude that knowledge and application of learning strategies can increase the aural memory. In fact, the acquisition of learning skills (both cognitive and meta-cognitive skills) makes learning easier for students. Therefore, it is suggested that storytelling

technique is employed in learning centers and primary schools to improve and strengthen auditory memory; so that the positive changes can be created in the performance of children in learning. One of the limitations of this study is that since this study was only conducted at a small sample size of students with reading learning disability and it was only conducted on third-grade students, it is essential that such research will be performed on larger samples and other levels of education.

References

[1] Ganji, M., Zahed Babolan, A; Moeinikia, M. (2012). Meta-analysis of research done on the role of teaching models on student achievement. Journal of School Psychology, Issue 1, Pages 93 to 107.

[2] Afroz, GA. (2006) . Learning disorders. thran: PNU. Thoughts.

[3] Snoling MB. (2009) Physiological origins and functional correlates of EEG rhythmic activities: implications for self -regulation. Biofeedback and Self-regulation 1996; 21: 3–33.

[4] Lerner, Janet. (2011). Special learning disorders (translated by E. Danesh), Tehran University martyr Beheshti.

[5]Gutierrez-Clellen، V.F. & De Curtis L. (2001). Examining the quality of children's stories: clinical applications. Semin Speech Lang. 22 (1): pp.79-89.

[6] mahjor, S. R. (2004). Psychology of the game, Shiraz useful publications.

[7] Chermak G. (2007). Central Resources Training: Cognitive, Metacognitive & Metalinguistic Skills & Strategies.In G.Chermak, F.Musiek (Eds).Handbook of (Central) Auditory Processing Disorder: Auditory NeuroScience.Vol:2.Plural Publishing Inc

[8] Musiek FE, Chermak GD.(2006). Handbook of (Central) Auditory Processing Disorders, Vol.1: Auditory Neuroscience and Diagnosis.1st ed.Plural Publishing Inc

[9] mirmehdi, SR, Alizadeh, H and Saif Naraghi, M. (2009) the effects of executive functions based on math and reading performance of primary school students with special learning disabilities. RESEARCH ON Y.1-12, Exceptional Children.

[10] McArthur، G.M.، Ellis، D.، Atkinson، C.M.، Coltheart، M. (2008). Auditory processing deficits in children with reading and language impairments: Can they (and should they) be treated?.Cognition، 107، 946–977.

[11] Sharma، M.، Purdy، S.C.، Newall، P.، Wheldall، K.، Beaman، R.، Dillon، H. (2006). Electrophysiological and behavioral evidence of auditory processing deficits in children with reading disorder.Clinical Neurophysiology، 117، 1130–1144.

[12] Alikhani, M., Bazrafshan, S and Rastgarpor, H. (2014) impact of non-school books on improving auditory discrimination injured children Shnvayy.fslnamh exceptional education, Issue 5 (127) .36- 24.

[13] Taghi-Zadeh, T. (2014). Investigate the evolution of auditory and visual working memory in primary school students. Research in Rehabilitation Sciences, Volume 10, Issue 2, Pages 249-239.

[14] Jacqueline F. Zimmermann, Morris Moscovitch, Claude Alain, (2015) Attending to auditory memory b r a i n r e s e a r c h 1 6 4 0 ,2 0 8 – 2 2 1

[15] Andreia Matosa, Tânia Rochaab, Luciana Cabrala*, Maximino Bessa. (2015) Multi-sensory storytelling to support learning for people with intellectual disability: an exploratory didactic study, Procedia Computer Science 67 : 12 – 18.

[16] Marina Fridin (2013). Storytelling by a kindergarten social assistive robot: A tool for constructive learning in preschool education, Computers & Education 70 : 53–64

[17] Keoch, E. B., Hebl (2010). Understanding tokenism: Negative consequences of perceived gender discrimination in male-dominated organizations. Journal of Management, 36, 537-554.

[18] Miller, S. & Pennycuff, L. (2008). The Power of Story: Using Storytelling to Improve Literacy Learning. Journal of Cross-Disciplinary Perspectives in Education, Vol. 1, No. 1. 36 – 43.

[19] mahmodi, H. (2006). The effect of the impact of storytelling on listening comprehension Iranian student, martyr Beheshti University master's thesis.

[20] saif Naraghi, M, and Naderi E-A. (2010). Learning specific failure and how to recognize and rehabilitation methods. Tehran: Lkyan.

[21] Abedi, M.R, Sadeghi, A. and Rabie, M. (2009). Implementation Guide and scoring four children Wechsler intelligence scale (WISC-IV). Isfahan: Publications Articles.

[22] Green, Eline. (1999). Art of storytelling. (Translation: Adineh pour, , T) .thran: Abjad.

[23] Eisenberg, D.schneider, H. (2007). "Perceptions of academic skills of children diagnosed with ADHD"

[24] Vally, A. (2007) .qsh though, Effective Method for Teaching Complicated Concepts in Medicine. Journal of Science Education Pzshky.dvrh 7, Number 1 (17), Ss160-155.

[25] Shamsian F. (2011) Auditory Processing Disorder (center) in Speech-Language Pathology, Journal of Research in Rehabilitation Sciences / Year 7, Issue 2.

[26] Wauters, L.N., Wim, H.J., Van Bon., Agnes, E.J.M. (2010). Reading Comprehension of Dutch Deaf children. *Journal of Reading and writing, 49, 19-76*

[27] nikforosh, M; Aghajanzadeh, M. (2014). Auditory processing in children with language-specific injuries, and rehabilitation of Mashhad Medical Sciences Journal Volume 2, Number 2.