Investigation of Effect of Storytelling on Verbal Language of Autism Children (Mild To Moderate Spectrum)

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***Abstract*—This study examined the effect of storytelling on verbal language in the mild to moderate autism spectrum children. Autism is the most important developmental disorder impairing social skills and language development and leads to communication inability. Twenty children aged 4-7 years with mild to moderate autism (available samples) who referred to Mashhad Nour-e-Hedayat center were selected. They were randomly divided into two groups of 10, i.e. control and experimental groups. The experimental group experienced learning to understand and produce speech through storytelling. Approximately 30 stories appropriate for the age of 3-7 years were chosen and told to children about 30 minutes (daily for three months). In both groups, children linguistic skills were assessed at the beginning and end of the study using Test of Language Development-Primary, 3rd Edition (TOLD-P:3). Statistical analysis was performed using SPSS version 24 software. Inter- group comparison of language skills was performed using non-parametric Mann-Whitney U test. Intra-group comparisons were performed using Wilcoxon test. The intra-group results showed a significant difference between the verbal language before and after the intervention. There was no significant difference in spoken ability of the experimental and control groups before and after the study. At the end of the study, the difference in speaking proficiency was significant between children of two groups. The results of this study showed the effect of storytelling on increasing the verbal language skills of children with mild to moderate autism spectrum.**

***Keywords*— Rapport, Positive Environment, Motivation, Rapport building strategies, Learning outcomes.**

I. Introduction

From the first epidemiological study in the 1960s and early 1970s to the present day, the global outbreak of autism spectrum disorder has increased significantly (Blumberg,

2013). Now, it is one of the most common transformational disabilities (Boyd, 2010). Autism spectrum disorder is one of the most important developmental disorders affecting social development of children and their abilities in social interactions and communication with others causing many problems for this range of children (Matlabi, 2016). Autism disorder is more prevalent in boys for 4 to 5 times, while, the probability that the patient suffers from severe mental retardation is higher in girls. One of the main problems in patients with autism disorder is delay in the beginning of speech or lack of speech evaluation in these children (Manteghi, 1993). Defective speech comprehension and production may affect academic achievement, personality and social development of the affected person. Recognition of language disorders in these children and their timely education is very important in the development of linguistic interactions (Sadeghi, 2008) and can be the basis for establishment of appropriate and effective educational programs. One of the most important and oldest methods of teaching and communicating information to children is storytelling. The story has a very wide scope, so that every kind of message can be send through it (Mohajeri, 1996). Storytelling can foster imagination of the child and familiarize him with the world around him and his environment and act as a bridge between the child and the world. Events that occur in a story have a particular order in which this sequence can depict hope in the future and meaning in human life, so, one can use storytelling as a way to develop the verbal skills of children (Jafari Mofrad Taheri, 2008).

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II. Methodology

This study was an applied research investigating 4-7 year old boys with mild to moderate autism. Available sample of boys from 4 to 7 year old with mild to moderate autism in Mashhad were selected. To eliminate the effect of different educational programs on the results of the study and increase the synergy of the samples, 20 male children (available samples) were selected among children with autism who were referred to the Nor-e-Hedayat center in Mashhad. CARS test was used to grade autistic children which included assessment of children physical movements, adaptiveness to changes, auditory response, verbal communication and communication with individuals. The selected children were randomly divided into two groups: the first group included children with autism disorder that did not learn to understand and produce speech through storytelling (control group), the second group included

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autistic children who were trained to understand and produce speech through Storytelling (experimental group). Test of Language Development-Primary, 3rd Edition (TOLD-P:3) was used as a tool for measuring the impact of storytelling on the verbal language skills of the subjects. For this purpose, the growth rate and abilities of the verbal language of these children were assessed using TOLD-P:3 and with the help of a speech therapist before the beginning of the study. Then, 30 appropriate pictorial stories for the age of 3-7 years were selected. The stories were told for the children in the experimental group for half an hour during the three months and every day. At the end of the study, the verbal language development of all children participating in the study was verified by the speech therapy of the center and reassessed using the TOLD-P:3. This test is used to measure linguistic skills in most children between the ages of 0-4 and 8-11. The theoretical framework of the TOLD-P:3 is a two-dimensional model including linguistic coordinates and linguistic systems (Table 1).

The organization system is measured by phonological analysis (phonological), related vocabulary (semantics), and sentence imitation (syntax). These sub-tests measure aspects of interlinking and mediation strategies used for organizing spoken language, connecting them to other symbols. Spoken system is measured by three subtests of word production (phonology), oral vocabulary (semantics) and grammatical completions (syntax). All three sub-tests assess encryption aspects used to generate meaningful speech. The main or primary subtests consist of six subtests whose results are combined and form composite scores (i.e. spoken language, listening, organizing, speaking, semantics, and syntax). These subtests are used to measure semantics and syntax. Therefore, sub-tests can be grouped according to systems or shared conventions and create the following components:

Table 1. Linguistic coordinates and Linguistic Systems

Linguistic system / Linguistics coordinates	Listening (Receptive skills)	Organization (Integration and mediation skills)	Speaking (Spoken skills)
semantics	Visual vocabulary	Related vocabulary	Oral Vocabulary
syntax	Comprehension	Imitation	Grammar Completion
phonology	Differentiating the word	Phonological analysis	Word production

Listening (visual vocabulary + comprehension)

Organizing (related vocabulary + sentence imitation)

Speaking (oral vocabulary + grammar)

Semantics (Visual Vocabulary + Relative Vocabulary + Oral Vocabulary)

Syntax (grammatical comprehension + sentence imitation + grammatical completion)

Spoken language (visual vocabulary + related vocabulary + oral vocabulary + grammatical understanding + sentence imitation + grammatical completion)

By conducting the TOLD-P:3, five scores are obtained: raw scores, weighted equivalents, percentage ranks, standard scores of subtest and compound interest. These scores are the most important information about the child performance in this test, because their analysis along with information from other tests and direct observation of behavior and information from other sources will ultimately lead to the correct identification of the child linguistic problem. Standardized Sub-test Scores: The most obvious indication of child performance in a subtest is provided by standardized scores. Standardized scores are the transformation of raw scales that create similar mean and standard deviation for the subtest. Compound Interest: Compound interest are scores that are calculated based on the various combinations of sub-tests. These interests are beneficial because it allows the examiner to assess the ability of an individual in the structures included in the test. Interests indicate the status of a person in relation to the language structures included in this test. These interests show the child ability to communicate with the general language, semantics, syntax, listening, organizing, and speaking (Hamil, 2010).

In the present study, among the obtained scores, verbal language was used to study the impact of storytelling on all features and systems related to the spoken language. Verbal language includes oral vocabulary and grammatical completions scores that measure semantic and syntax aspects. To calculate speaking profits, the standard scores obtained from the main subtests of 3 and 6 (oral vocabulary and grammatical completion) were combined and then, the obtained standard score was converted to another standard score (interest) using the test tables. Then, the resulting scores were converted to the rank scores using the compounding table for the interpretation of the scores. Data were analyzed using SPSS version 24 software. The significance level (p value) was considered to be 0.05. The non-parametric Wilcoxon test and non-parametric U-Mann-Whitney test were used for comparing the mean of two groups (inter-group and intra-group), respectively.

Table 2 - Compound Interest Interpretation Guide

Description	Standardized score
Very good	131≤
good	120-130
Higher than average	111-120
average	90-110
Lower than average	80-89
Weak	70-79
Very weak	≥69

III. Results

After conducting subtests before and after intervention, the raw scores from each of the subjects were converted to standard scores. In Table 3, the mean scores of two standard sub-test scores were presented in two groups (before and after intervention).

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Table 3. Mean scores of standard subtests scores in experimental and control groups before and after intervention

Group / Subtest	Control group (N=10)		Experimental group (N=10)	
	Before intervention	After intervention	Before intervention	After intervention
Oral vocabularies (Mean±SD)	6.9±2.23	8.9±3.75	8.9±0.02	9±1.33
Sentence completion (Mean±SD)	4±2.62	6.6±4.55	3.8±2.78	9.6±4.19

To examine the effect of storytelling on the ability to express thoughts orally (child spoken language), the standard scores obtained from main subtests of 3 and 6 (oral vocabulary and sentence completion) were combined and then the obtained standard score was converted to another standard score (spoken interest), and the interest scores were converted to rank scores from very weak to very good using the compounding commentary table. The frequency of rank scores in each group was calculated and then to assess the impact of storytelling on verbal language, intra-group comparison of these scores was conducted by the non-parametric Wilcoxon test and the inter-group comparison using non-parametric Mann-Whitney test (before and after intervention). The results are shown in the tables below.

Table 4: Comparison of ranking of speech markers in the participants before and after the intervention (intra-group)

Group / Rank	Control group (N=10)		Experimental group (N=10)	
	Before intervention	After intervention	Before intervention	After intervention
Very good	4	4	1	1
good	3	0	4	2
Higher than average	2	1	4	0
average	1	4	1	1
Lower than average	0	0	0	4
Weak	0	1	0	2
Very weak	0	0	0	0
P Value	0.034		0.026	

Table 4 shows the results of the intra-group comparison of the subjects. In both groups, there was a significant difference in the language skills of the subjects before and after the study ($p = 0.034$ and $p = 0.026$) and, before the intervention, both groups lack children with above average spoken abilities and skills. The results of the comparison between the groups before the storytelling intervention are presented in Table 5.

Table 5. Comparison of the level of spoken skills in control and experimental groups before intervention

Criteria / Level		Very weak	Weak	Lower than average	Average	Higher than average	Good	Very good	P Value
Verbal language	Experimental	4	3	2	1	0	0	0	0.096
	Control	1	4	3	1	0	0	0	

As shown in Table 5, there is no significant difference between the two groups before the storytelling intervention ($p = 0.096$), and both groups were similar in this regard. The results of storytelling intervention and its impact on children language skills are shown in Table 6.

Table 6: Comparison of Spoken Scores in the control and experimental groups after intervention

Criteria / Level		Very weak	Weak	Lower than average	Average	Higher than average	Good	Very good	P Value
Verbal language	Experimental	4	0	1	4	0	1	0	0.007
	Control	1	2	0	1	4	2	0	

The results of Table 6 showed that the verbal language of children in the experimental group improved after the storytelling intervention compared to the control group and there was a significant difference between the subjects in this group and the control group ($p = 0.007$). More participants in this group reached the level of the average language skills.

IV. Discussion and Conclusion

Language is the center of human mental capabilities. A person with speech impairment may have a lot of intelligence, but a defect in the comprehension and production of speech may affect his academic achievement, his personality and social development (Sadeghi, 2008). Defect in the development of language, like the delay in its growth, is characterized by autism disorder. There are differences in productive ability, oral statements and lexical perceptions in language and speech skills between healthy children and children with autism (Jarold 1997). Storytelling affects speech, strengthening the vocabulary and information, and finally, the language learning of children (Hemati, 2002). Therefore, in this study, the effectiveness of storytelling on the spoken ability of children with mild to moderate autism spectrum was studied. The information and results from the intra-group comparison in Table 4 showed that children in both the experimental and control groups had a higher level of language skills at the end of the study than the

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beginning of the study, and the differences in the language skills of the children in the two groups were statistically significant ($p = 0.026$ and $p = 0.034$ respectively) before and after the study. The results of comparison between the groups presented in Table 5 showed that the level of children verbal language in the control and experimental groups did not differ significantly at the beginning of the study ($p = 0.097$), which seems to be due to the same education provided to these children in the center of Nour-e- Hedayat before the start of the intervention. This also confirmed that random allocation of children in the two groups has been done correctly. Also, based on the scores for speaking, the children in both groups had moderate-to-lower levels of language proficiency. The results presented in Table 6 showed that after the intervention, the level of spoken development in the children of the experimental group was more than the control group and the difference between them was statistically significant ($p = 0.007$). In addition to the children in the experimental group, a few control group children who were not involved in storytelling have been able to achieve good and very good levels of language proficiency at the end of the study. Therefore, it can be argued that part of this progress in the children of both groups could be due to the impact of their common educational programs in the center. By examining Tables 4, 5 and 6, it can be argued that the difference in the level of verbal language in the experimental group children was due to the similarity of the training environment of the subjects and other programs and educational processes provided for both groups in the Nour-e- Hedayat Center which were the result of using storytelling, appropriate stories and having a systematic and continuous storytelling program to enhance linguistic development and language systems in children with mild to moderate autism. Storytelling can be combined with other educational programs, therapies, and speech therapies to improve speech abnormalities of children with autism. It can be a useful tool for helping more effective advancement, as well as the faster achievement of therapeutic and educational goals and enhancing linguistic capabilities.

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