



EXAMINING THE EFFECTIVENESS OF COGNITIVE EDUCATIONAL GAMES PACKAGE ON THE PERFORMANCE OF NEUROPSYCHOLOGICAL SKILLS STUDENTS IN DYSLEXIC STUDENTS

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ABSTRACT

Aim: Cognitive Neurosciences and reading have close relationship with each other. Neuropsychological skills are prerequisite for reading. Looking at the dyslexia neurological challenges and benefits of and neuropsychological and cognitive function of play was the general objective of the study that examined the effectiveness of educational package of cognitive plays on neuropsychological skills of dyslexic students.

Material and Method: The study design was quasi-experimental with pre-test and post-test and follow-up period (two months after the implementation of the post-test) in which 30 dyslexia male students were selected as sample of study using non-random sampling, and they were assigned randomly into experimental and control groups. Experimental group was educated using researcher-made tool in 1.5-hour sessions over three months. For data collection, the fourth edition of the Wechsler Intelligence Scale for children, dyslexia test and neuropsychological tests of Connors were used. Data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (analysis of variance with repeated measures).

Results: Data analysis showed that educational package of cognitive plays are effective in improving neuropsychological performance of dyslexic students ($p < 0.01$). In addition, results of analysis of variance with repeated measurements showed that the effect of educational package of cognitive plays in improving the neuropsychological skills of dyslexic students was stable ($p < 0.01$).

Discussion: educational package of cognitive plays can be an effective therapeutic approach to improve the neuropsychological skills of dyslexic students.

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Introduction

Reading is one of the most important gates of knowledge and skills in today's societies. However, dyslexia accounts for approximately 5-17% of children and causes the most common form of impairment in learning [1]. Dyslexia is one of the most common learning disabilities among elementary school students. Some experts believe that 80% of children with dysfunctional learning disabilities [2]. Therefore, in all school failure, students can see signs of weakness in reading skills [3].

Dyslexia is described as a specific learning disorder that originates from a psychological neurology and is characterized by problems in the correct recognition of psychosis, spelling poverty, and decoding ability. These problems lead to defects in relation to other cognitive abilities [4]. The disorder is diagnosed when it is difficult for an individual to develop unknowingly, despite the training, opportunity, and intelligence [5].

Dysfunctional people are often in trouble due to reading disabilities. In addition, the negative impact of this disorder is not limited to academic affairs, but its harmful effects result in low self-esteem, anxiety, depression, and tendency towards antisocial and destructive behaviors [6]. Contrary to the incidence and severity of dyslexia, its underlying causes have not been completely ascertained, but it is widely believed that dyslexia is linked to the underlying psychiatric nerve and is seriously related to the multiplicity deficiencies [1,4,7,8]. Concerning the nature of cognitive and perceptual disorders of dyslexia, they point out that these people are in a false sense in vocabulary knowledge, fast auto naming, short-term oral memory, visual-spatial perception, and visual-motor coordination. [9] They believe that the defect in phonological processing in dyslexic children may be due to inadequate cognitive resources, not because of imperfect phoneme representation. In addition, [10] reported that dyslexic children can activate phonemic representations sufficiently in tasks related to short-term work memory. [11] argue that cognitive neuroscience and reading instruction are closely interrelated. Neurological evidence suggests that reading is done in the brain and depends on the brain systems used in the spoken language. According to [1], abnormal brain function is thought to be a major reason for dyslexia. It is important to confirm the origin of dysfunctional neuroscience, neuroimaging studies of the unusual activity of the Perlino-Freundo-Tempore-Partial network Has been reported in dyslexic patients and has associated cognitive impairment with neurological disorders [12].

There is a significant correlation between reading disorder and psychiatric nerve deficiency. This is due to the attention to scientific resources: phonological defects [13-16]. Cognitive-Perceptual Deficit [17,18,19,10], memory impairment [20,21,22], defect in attention [23,24], Defects in central cohesion [25,26], deficiencies in the speed of naming and processing [27,15] functional impairment [21,1] and defective motor skills [27,15,28]. In an effort to find the most effective treatment for dyslexia, several studies have examined the effectiveness of various methods. In the meantime, the game is a method used by many psychologists and researchers over decades to treat a wide range of disorders and problems and to validate them [29]. According to [30], children's cognitive skills in the game are essential for school success. The game stimulates the sensory-motor cortex, establishes many connections between the limbic area and the visual, auditory, and auditory sectors, and the repetition and continuation of such arousal by creating new learning, the interaction between the brain and the nervous system on the quantity and quality of behavioral response, and vice versa, improve The brain and nervous system can be used for their sequential behavior and exercise [31]. An impressive increase in the number of findings suggests that the game not only affects the brain structure and neurological functions of learning, but also influences the brain through the biological processes involved with new stimuli and learning skills [32]. Studies have repeatedly shown that many aspects of recognition, such as motion-visual memory, spatial recognition, and work memory can be improved by play [33]. Neuropsychologists say the game triggers brain reengineering, motor growth, rapid response, increased ability, and increased learning capacity [4]. [34] suggests that cognitive games interventions increase cognition more than other activities. The [4] on dyslexic children states that cognitive and psychological games create changes in brain function.

The findings from brain research and learning indicate the importance of playing in childhood. Active brain produces very important neurological links for learning. While the inactive brain does not induce these sustained neurologic links. The research shows that the game is an important tool for the development and development of neural structures and a means to practice the necessary skills in the future of life [30]. According to [35], intensive training of intensive care can lead to the normalization of the activity profile in the reading involved, the posterior margin of the temporal spinal cord above the left. [23] consider cognitive games to be effective in developing, acquiring and pursuing components of reading skills. They state that there is a relationship between reading skills and cognitive structures. According to [36], dyslexic children have difficulty hearing and vision perception before pre-primary education begins. They said children's education was effective in this regard. [37] in their research showed that a series of educational exercises (visual education training) through puzzle games can improve the learning perception, especially the vision perception of dyslexic children.

Considering the long-term consequences of dyslexia and its high prevalence among school students, appropriate planning for rehabilitation and the correction of their learning problems is necessary. Considering the incompleteness of the common methods for treatment of dyslexia and considering the cognitive problems in these children, the researcher has suggested the need for cognitive interventions and psychological nerve in the form of related games through the framework of dyslexia.

Therefore, the most important research question is whether the cognitive games curriculum based on dysfunctional components is effective in improving the reading performance of dyslexic children.

Materials and methods

The research method was semi-experimental with pre-test and post-test design with control group and follow-up period. In this study, 25 sessions of 1.5 hours were provided to dyslexic students for a three-month cognitive training curriculum. Cognitive games educational package based on scientific background and confirmation of experts in 11 sets of collections was

conducted in the form of cognitive games educational package among male dyslexic students. Also, the variables of psychological nerve skills were measured in two groups of cognitive games and control group in the pre-test and post-test phase and follow-up period (after two months).

Teaching in learning disability training courses that were selected to approve the package. Sampling in this group was conducted randomly and purposefully (snowball) based on the criteria that 10 faculty members and experts in the field of learning disorders were selected.

The statistical population of the study included all students with a third grade boy who had referred to Yazd learning centers in the academic year of 1996-95. Using a sampling method, a sample of 30 students, two centers of four learning centers (District 1 and 2) in Yazd city were selected. According to the statistical population, 30 students were selected by random sampling. Then, they were randomly divided into two groups, one experimental group (15 people) and one control group (15 people). The research tools included:

Fourth Wisconsin Scale of Children (WISC-IV): The fourth Wechsler IQ Scale is one of the most comprehensive instruments for assessing the clinical intelligence in intelligence and has the ability to measure for the screening and diagnosis of learning disabilities. This scale was published in 2003. This scale changes from the previous three levels to changes in test scores, updating questions, revisions to the concepts and the main structures of the test. This test was standardized in 2013 by Afrouz, Kamkari, Shokrzadeh and Hemet, and the higher overall stability coefficients From 0.9 and in quadratic factors higher than 0.8. Also, with emphasis on confirmatory factor analysis, it was found that standard fitting indicators and Benthaler-Hortz indicators have a good fit and experimental data with a sample size of about 800 students from Tehran in the elementary school has a validity. The correlation above 0.7/0 between total intelligence in the fourth version of IQWS and Stanford Binet is a measure of the validity of the criterion.

Reading and Dyslexic Reading: This test was performed by [38] and was done on 1614 (770 male and 844 female students) in five educational levels in Tehran, Sanandaj and Tabriz. After collecting data and performing statistical operations for each base in each city, raw scores and norms scores were calculated. Alpha coefficient of reading and dyslexic reading is 0.81 [38].

Conner's Psychological Competency Test: This test was developed by Connors in 2004 to assess psychological nerve skills such as attention, memory, sensory-motor activity and spatial processing in four spectra (not observed to severe) for children aged 5 to 12 years Known. [39] translated and standardized the questionnaire and obtained the validity of this tool through factor analysis. They reported the validity of the structure of this tool and the reliability of this tool was reported by Cronbach's alpha of 72%.

Data were collected and implemented in a pre-test of the Voxler-IV test, Conner's psychological nursing test and dyslexic test for both experimental and control groups. Subsequently, the training program for the experimental group was conducted for three months and Each session was done for an hour and a half for each student. After two months, the performance of psychosocial skills was evaluated in both the experimental and control groups. The data was analyzed by SPSS-23 software and by multivariate analysis of variance analysis with repeated measure.

Results

In this section, we examine the normal distribution of each dependent variable at different stages of time. The results of the Shapiro-Wilkes test were used to evaluate the psychological nerve scores. As can be seen, the results of Shapiro-Wilk's test do not show a significant difference ($S = 0.17$, $Z = 0.57$). Therefore, we can say that the psychological nerve scores are normal. In the following, the results obtained from the Muchelse test for spherical examination are also given in the table below. Due to the fact that the test for all related variables has been meaningful ($P = 0/000$), the assumption of spheroid has not been met. Therefore, the Epsilon modification method is used to examine and interpret the output results from SPSS software after repeated measurement. Of course, in any situation that there is no spheroid, if the result of the Boxe's M test is not meaningful, then the multivariate test results can be used. Also, the results of Boxe's M test indicate that homogeneity of variance-covariance matrices is also satisfied ($\text{Sig} > 001$).

Considering that the Boxe's M test was not meaningful, it is possible to use multivariate test results. In the table, the results of multivariate analysis of variance on the mean of psychological nerve in the experimental group with cognitive methods and the control group in the stages of pretest, post-test and follow up are presented.

Considering the significance of the test result in all models ($P = 0/000$), regarding the effects of intravalves (time), it can be concluded that at least between the two phases of the time and the changes related to the variables studied Different times were different.

Considering the significance of the results of the tests ($P = 0/000$), regarding the interaction between time and group, it can be concluded that the behavior of the groups is at least one of the dependent variables in at least two different stages of time. This

means that at least one of the dependent variables has groups in the behavioral pretest that may vary in post-test or follow-up. If the groups were identical in the pretest, the dependent variable in this regard actually showed a significant effect on at least one of the interventions.

Regarding the significance of the independent variable effect between the subjects (group), there is a difference between at least two groups of the studied groups and at least one of the variables studied, to determine which difference The variable is dependent on the data in Table 1, which is the result of repeated measurements for the psychological nerve test.

Sig	F	Average squares	df	sum of squares	Total
.007	8.321	18119.211	1	18119.211	Group
		2177.513	28	60970.356	Error

According to the data in Table 1, it can be stated that, considering the significant level obtained in the experimental group ($f = 8.32, P = 0.007$), between the groups (cognitive and control) There is a significant difference.

Discussion

This study aimed to investigate the effect of cognitive performance of children with dyslexia training package games for games. Results showed that cognitive training package on effective reading performance. By the time the research was conducted by the researcher, this study did not match the research. Therefore, research that is partly consistent with this research question is referred to. These findings can be explained by theoretical foundations of the research. The results of this study are consistent with the findings of the research [13,40,5,33,34,37,41,23,19]. The above researchers have shown that psychological nerve exercises and Cognitive-perceptual exercises, perception of direction, visual perception, and auditory perception, spatial recognition, shape recognition, visual memory, auditory memory, short-term memory, verbal active memory, selective attention, sustained attention, divided attention, spatial attention, speeding up , Executive functions, detail coherence, extraction of meaning and motor skills can be Neuropsychological performance skills of reading and even that is a prerequisite for effective education.

In explaining the findings, it can be said that cognitive anxiety disorder in the early stages of growth is due to weakness in various cognitive abilities and neurophysiology [17,42]. Given the need for preventive education, Using two sources of timely identification and identification, one is the history of parents and other close relatives such as their siblings in reading and the development of skills that can predict reading [43] . In the present study, the main goal of the educational package is focused on activities that stimulate and strengthen the neurological skills of children with learning disabilities and especially dyslexic children. Also, in explaining the current research, it is possible to say that according to the scientific researches conducted by children for mastering reading They have to master a variety of skills. These skills, neuro-psychological aspects, and through experience, education and training obtained. Most children these skills automatically. However, the skills of dyslexic children have trouble learning when they have taught them. Extensive research shows that intensive and continuous exercises lead to changes in cognitive skills. Regarding the problem of brain flexibility and the benefits of psychological nerve and the positive affect of learning in the game, the teaching of cognitive components expressed in the form of the game is not intensive training. only in treatment, improve and raise the level of academic performance, but also cognitive and neuropsychological early interventions can be effective in preschool.

The outcomes of this plan could be a way for teachers, educators, psychologists and therapists to learn learning disabilities, especially children with reading disabilities. This research was accompanied by limitations such as the lack of use of dyslexic girls and the age limitations of subjects. Therefore, the effectiveness of these games is recommended at different age intervals and on girls. Also, this study was conducted in a small sample of dyslexic students and also in the third grade elementary school, and it is necessary for such research to be done in larger samples and other educational levels.

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