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The study of the relationship between birth weight and Dyslexia and birth weight in elementary school students

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Abstract

The present study examined the relationship between birth weight and dyslexia in elementary students. 30 children with dyslexia who referred to Koosha specialized center for learning disability on behalf of their schools in Babol were compared with 30 healthy students who were similar to the children of dyslexic group in terms of cultural-economic features. Wechsler children test and Reading & dyslexia tests were used to evaluate dyslexia and intelligence. Also, vaccination card was used to extract birth weight. Research data were analyzed by descriptive statistical methods, independent T-test methods and Pearson correlation. Our results indicate that there is a significant relationship between dyslexia and birth weight.

Keywords: Dyslexia, Birth weight, Intelligence, Elementary students.

Introduction:

Children with learning disability are found in every classroom. There is an increasing concern about children and teenagers with learning disability because they have lots of problems in learning academic skills and other skills despite having a mental talent for learning them. (Lerner 1997) There are many children who have normal appearance and their physical growth, height and weight indicate their normality. Their intelligence is normal, they can speak well, play like other children and communicate with others like their peers, do their tasks and responsibilities at home but they face serious problems when they go to school and want to read, written and learn math. These children who have enough confidence in their academic progress gradually find out that other students have better academic status than them. After a few months of the first academic year, they see themselves as different from other students and may feel humiliated or if their teachers or other peers blame them, they may hate lesson, school, teachers and other students. It causes anxiety and lack of trust in these children and makes the problem totally internalized and even incurable. Children with learning disability do not have a slow

progress in all fields. Learning disability may appear in a specific framework of education like reading, calculating, writing and so on. These children cause bewilderment in classroom and concern at home by their behaviors. (Wallace and Mclaflin 1989) The prevalence of learning inabilities is determined according to the definitions, principles and evaluation methods. For this reason, different statistics were provided in different reports. Psychiatrists Association of America in its final classification of mental disorders estimated the prevalence rate of learning inabilities between 2 to 10%. The ministry of education in America (1993-1994) reported the number of students with learning disability about 2369385 students in 1992-1993. There are many different theories about how learning disability is made and each theory attempts to consider different causes for it. It should be noted that we can rarely consider a factor as the cause of disability and it is better to introduce several factors in this field. The factors which are directly involved in creating learning disability include environmental, emotional, physical-intellectual and genetic factors. Dyslexia is one kind of learning disability that is a combination of abilities and problems that affect learning process in one or several fields like reading, writing and spelling. Children with learning disability, form a Heterogeneous group that has different features. But it should be considered that all children with learning disability may not have all these features and on the contrary some children who do not have special disability may have some of these features. (Omidvar)
One of the possible assumptions that are considered as the cause of dyslexia is the Prematurity of child at the time of birth or the low weight of the child. Thus, low weight increases the risks of these children in reading and calculating Insufficiency. This issue is truer about boys and indicates that they are more vulnerable than girls in terms of the problems before the birth or at the time of birth. (Johnson and Bersh 2000, cited in Omidvar) The studies showed that premature children have more risks than normal students in term of learning disability. (Olson et al 1998, cited in Omidvar) Another study showed that children with a weight less than 2kg at the time of birth have problems in terms of perception, visual - motor, reading and calculating. (Chaudhari et al 2004, cited in Omidvar) Thus, according to the importance of the disorder of dyslexic children and birth weight, the research hypotheses are as follows:

1. There is a relationship between dyslexia and birth weight.
2. There is a difference between the birth weight of dyslexic children and non- dyslexic children.

Research methodology

The population, sample and sampling

The method of this study is descriptive- correlational. The research subjects are 30 children at the age of 7-11 who referred to Koosha specialized center for learning disability. A specialized interview was done with these subjects in Koosha specialized center for learning disability according to Reading & dyslexia test. (Normalized by Karami Nouri and Moradi) and the results show the dyslexia of introduced children. 30 normal children as the control group who were selected by random sampling were matched with dyslexic children in terms of the features affecting the studied variable, The researcher attempts to test the relationship between birth weight and dyslexia and also compare the average weight of dyslexic and non-dyslexic children.

Research tools

1. Wechsler children intelligence test

The revised scale of Wechsler children intelligence test was used in order to measure the intelligence quotient of the referred students. This test was normalized by Sima Shahim in Shiraz University. The reliability coefficients obtained in Shiraz by re-test varied from 0/44 to 0/94 among all sub-tests and also varied from 0/42 to 0/94 in Bisection method. (Hebrani and Behdani)

2. Reading disorder test

Reading & dyslexia test that was normalized by Reza Karami Noori and Alireza Moradi was used to identify dyslexia of the children who referred to learning disorder center on behalf of schools. This test was performed for 5 years on 1614 (770 male students and 844 female students) in 5 grades in 3 cities of Tehran, Sanandaj and Tabriz. After data collection and performing statistical operations, raw scores and norm scores were calculated for each grade in these cities.

3. vaccination card

By using the vaccination card of students, their birth weight was extracted.

The Analysis of Data

We have used Descriptive statistics and inferential statistics such as single variable regression and single variable t-test, Friedman for analyzing data.

Research Findings

Table 1. The intelligence average score of dyslexic children

General intelligence	Verbal intelligence	Practical Intelligence	Statistical Indicator gender
91/93	91/07	92/73	**boy**
93/67	91/53	96/2	**girl**
92/8	91/3	94/47	**total**

A study on the intelligence of dyslexic children (table 3) by using the revised Wechsler intelligence scale shows that the average practical intelligence of boys was 92/73 , verbal intelligence 91/07, general intelligence 91/93 and in girls practical intelligence was 96/2, verbal intelligence was 91/53 and general intelligence was 93/67. Also, the total intelligence average of boys and girls was calculated as 92/8.

Table 2. The average weight of dyslexic and non- dyslexic children

total	girl	boy	Gender of subjects
2/995 (100)	3/270 (%50)	2/720 (%50)	**dyslexic**
3/31 (100)	3/16 (%93/33)	3/45 (%6/67)	**Non-dyslexic**

Also, the average weight of dyslexic group (table 2) is less than the control group and 50% of dyslexic children have a weight less than 3kg while it is 6/67 % for non- dyslexic group.
Pearson correlation coefficient and independent T test was used to test the research hypotheses.

Table 3. The summary of statistical analysis for the research hypotheses

confidence level	t	r	df	n	Statistical Indicator of variables
0/99	-	0/463	28	30	**The Relationship between birth weight and dyslexia**
	-2/36	-2/36	58	60	**The difference of birth weight in dyslexic and non- dyslexic children**

The correlation coefficient between dyslexia and birth weight was 0/463. This correlation coefficient is significant at 0/1 with the degree of freedom (dn=n-2). Thus, the null hypothesis is rejected and the research hypothesis that: there is a relationship between birth weight and dyslexia is confirmed. In the second hypothesis, the independent T was obtained as -2/36. This T is not significant at 0/1 level with the degree of freedom 58 (df=n-2). Thus, the null hypothesis is confirmed and the research hypothesis that: there is a difference between the average birth weight of dyslexic and non- dyslexic students is rejected.

Conclusion:

In the first hypothesis, there is a significant relationship between dyslexia and birth weight that is consistent with the studies of Johnson and Berslo (2000) and Chaudhari (2004) to some extent. However, certainly dyslexia cannot be predicted by birth weight but some studies stated that there is a high probability that the children with abnormal weight had dyslexia that needs more detailed and longitudinal studies with bigger sample size. By testing the second hypothesis, it was shown that there is not a significant difference between the averages of the two groups in terms of birth weight. It is not consistent with the study of Olson (1998) to some extent. Thus, the results of this study cannot be easily generalized. The limitation of performance and research environment makes the results of this study to be interpreted and discussed carefully.

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