

Study and Comparison of Anxiety and Depression as Predictors of Attention Deficit Hyperactivity Disorder in Primary School Children of Tehran

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ABSTRACT: Attention deficit / hyperactivity is a disorder in which hyperactivity, attention deficit and abrupt behaviors are more and more severe comparing to other children. 3 to 5% of children are having this disorder and it is more common and seen in boys. It is possible that in some, more symptoms of hyperactiveness, abrupt behaviors and in some attention deficit would be observed more. The main purpose of this paper is to study the relationship between Anxiety and depression as the factor causing attention deficit disorder / hyperactivity in children in primary schools. This paper will also study the differences between normal children and children having this disorder. With using descriptive statistics, absolute frequency percentage, cumulative frequency percentage, column chart, pie chart and also mean and standard deviation have been used for comparing the demographic characteristics. For testing hypotheses the multi-variables variance analysis (MANOVA) and logistic regression have been used. Due to the value of F-statistics equal to 116.348 and significant level of 0.00004, there is a significant difference between children with hyperactivity and attention deficit disorders and normal children regarding Anxiety and depression. Also it can be said that 83.9% of predictions for the group without ADHD disorder and 78.6% of predictions for the group with ADHD disorder are correct. In fact it can be said that generally our model has determined the individuals correctly around 81.3%. in logistic model the significance level of the depression variable is 0.00001 and for Anxiety it is 0.002 and both are less than 0.05. These results indicated that depression and Anxiety can predict the probability of children coming down with hyper-activity and attention deficit.

Keywords: Anxiety, Depression, Hyperactivity, Attention deficit disorder

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) in children is a common heterogeneous disorder and its prevalence is estimated at 3 to 5 percent in elementary school-aged children. Many children have normal behaviors and their physical growth, height and weight are indicators of their normality. They have rather normal intelligence, speak well and play like other children and communicate with others like their peers. They possess the required self-help capacities; carry out well tasks which they are assigned to do them by their parents and have regular behaviors. However, at school and in learning reading, writing and math skills, they would face serious problems. Gradually, finding out other children are better in learning, they experience a sense of humiliation and little by little the seeds of hatred from schools and education would grow in them. Parents, on the other hand, unaware of the reasons of their inabilities toughen the situation by putting them under pressure and multiply the difficulties (Ahadi et al., 2003).

Attention deficit hyperactivity is a disorder in which hyperactivity, inattention and disruptive behavior and

impulsivity are more serious and it is diagnosed more frequently in boys than in girls. In some children, the symptoms of hyperactivity and impulsivity and in others the symptoms of inattention may be seen more. ADHD's symptoms emerge before seven years of age but it brings about serious problems at school. The disease is known for a long time and there are a number of factors that may contribute to it but it seems that it is mainly due to a defect in evolution of nervous system. Children with ADHD may have partial defect in some parts of brain which are responsible for attention, concentration and regulation of movements. Heredity and genetics also play a part in creation of this disorder. In some other cases, the structure of brain may be injured during the period of pregnancy and it comes up with this problem (Dehgani Firozabady, 2007).

In any society, anxiety is considered as a part of life and an appropriate and compatible response. Lack of anxiety or the extreme one may cause a number of grave problems, while, normal and constructive anxiety force

people to make effort properly in doing their affairs so that produce a fruitful and durable life. (Peters Mayer, 2008).

There are a set of physical, intellectual and sensational symptoms all of which are the indicators of anxiety:

Physical symptoms: include heart palpitation, dyspnea, and loss of appetite, nausea, insomnia, frequent urine, blaze face, sweating, speech disorder and disquiet (Dadsetan, 1999). Intellectual and sensational symptoms: include being amazed, nervous, impatience, wacky, worried, feared, depressed, shy, and alert and having the sense of excited and aroused (Khairi et al., 2008).

Depression is the most prevalent disorder in psychic pathology which has increased recently and it is also called psychic cold. Almost everyone has somewhat experienced this disorder which is called normal depression. Depression is not limited to a particular time or place but it is a response against a psychic pressure (e.g. stress) occurred at any time and for any person. People are incapable of recognizing their depressive state because it is difficult for them to differentiate between depression and a regular sadness. People are inevitably placed in a situation bringing for them sadness. Sadness means unhappiness and being unsatisfied about a condition which is not pleasant. This state would not be followed by a real psychic agitation and reduction of spiritual insight (Rosenhan et al., 2008; Najarian, 1994).

Though no reliable literature could be found about depression in children as an independent disorder up to 1960s, in past 15 years psychologists have obtained a wider recognition about it and the researchers have concluded that a condition like depression in adults can be observed in children as well and they may suffer from low to high level of depression (Eley, 1997). In such approach, childhood depression term is applied as a synonym for states like sadness, insufficiency, despair, and hopelessness. According to growth psychologists and clinical psychologists, the symptoms of children's depression are mainly similar to adults' and appeared not by one but a set of signals such as inability to enjoy, low self-esteem, social isolation, exhaustion, crying, difficulty in sleeping, eating and excretion, self-destructive pulses, difficulty in concentration, weak learning performance, feeling guilty, low energy and thought of suicide (Bootzin et al., 1993; Shaffer et al., 2002).

Given the rate of prevalence, nature, causes and importance of the disease, this research studies and analyses the current conditions and the role of anxiety and depression in appearance of ADHD. The emphasis is on a big part of the society, children, which specify the future of a country. So, considering such issues and problems means validating and valuing them and planning and investing on development of the country.

METHODS AND MATERIALS

Considering the method of compiling data, the present research is of descriptive (not experimental) kind which is done by correlation method. The current sample consists of 300 elementary students from Tehran in academic year of 2011-2012. To estimate the volume of sample, Cochran method and multistage random sampling has been used. By descriptive statistics, we used absolute frequency percent, cumulative frequency percent, column diagram, circle diagram, average and standard deviation to compare the demographic characteristics and multivariate analysis of variance (MANOVA) and logistic regression to analyze assumptions. It should be noted that before deductive analysis, the defaults like tilt, elongation, normality, linearity and equality of variances were analyzed by the relative tests. Ultimately, the data were analyzed by SPSS software version 16.

We primarily studied the valid sources like books, scientific-scholarly articles and understudied theses to access to research literatures and carried out Spence anxiety and Maria Quas depression questioners to compile data by going to selected schools. Children's depression inventory (CDI) of Maria Quas is a self-test, symptom oriented and 27 items measure which is appropriate for 7 to 17 children and juveniles. Each item of CDI has three options of 0, 1 or 2 and the higher scores indicate the growth of intensity. 0 means there are no symptom, 1 shows the average and the option of 2 indicates the definiteness of the disease. To show how much each option describe his/her state in past two weeks, the subject chooses one of the options for rating. The total scores range from 0 to 54. About 50 percent of items start with an option which shows the highest intensity rate of the disease symptoms. For others, the option sequence is inverted. This test was prepared for translation and being carried out in 1370 by permission of Dr. Quas. Then by guidance of the author, it was employed in several student theses such as Mojgan Mirza, Noruzi and in PhD thesis of Ghoreyshi (equated by Mousavi et al., 2007). Afterwards, the ultimate edition was done under supervision of Dr. Berahani in order to better comprehension of the questions. In terms of executive matter, the item of question about suicide is problematic in schools and it is mostly requested for its omission by education areas or schools. However if the test is correctly implemented, it bears the required capacity in recognition of a vulnerable population which need emergent treatment. Alpha coefficient in primary investigation of this test in Ms. Mirza thesis is 0.67. In Ghoreyshi thesis, the stability coefficient by Spearman Brown Method is 0.85, Alpha coefficient for the first part is 0.83 and for the second part is 0.74. Although CDI has 27 items, due to the problems in question about suicide and omission of it by schools, the two parts have been equal and each one has had 13 items.

Spence test of children's anxiety has been designed according to the DSM-IV statistical and recognition

categorization to measure and evaluate the children's anxiety. In 1997 to 1998 the primary form of this scale was approved in Australia in two national massive research of the analysis of affirmative and detective factor of 6 factors in age range of 8 to 12 and 7 to 19 (Spence, 1998; Muris, 2002). This DSM-IV based scale which has been provided for society samples and to evaluate an extensive range of anxiety disorders among children has had good psychological features. It has been standardized in countries such as Netherland, Belgium, Germany, Japan, Australia, New Zealand and UK and a high stability has been reported for it (Spence, 2003). This scale includes 38 questions to reflect the target. 6 questions have positive state and designed for lowering the negative orientation of answers.

The scale was carried out by Mousavi et al. (2007) over 450 normal girls and boys and the stability was reported well. In this research, Cranach's alpha was 0.89. Affirmative factor analysis has indicated that it has a good practice showing the acceptable validity of this questionnaire.

RESULTS

The descriptive findings revealed that the age of children in averagely 10.30 with standard deviation of 1.032 is minimum 8 and maximum 12. Children's education level in present sample is the second, third, fourth and fifth grade. Most of children (50.1 percent) are in fifth grade. Anxious children in normal group have the average of 16.30, standard deviation of 6.130, the minimum of 7 and the maximum of 28. Anxious children in ADHD group have the average of 7.09, standard deviation of 3.826, the minimum of 7 and the maximum of 17. Depressed children in ADHD group have the average of 14.3448, standard deviation of 3.992, the minimum of 9 and the maximum of 29.

The logistic model has been employed in studying the relation between anxiety and depression as the creators of attention deficit hyperactivity disorder in children. In logistic test, the standard variant is discrete and prospective variant can be discrete or continuous. In our analysis, ADHD (in form of existence and nonexistence of this disorder) in children is as a discrete standard variable and the rate of depression and anxiety is used as the continuous prospective variable. Given these variables, the model is as follow: $Y = \alpha_0 + \alpha_1 D + \alpha_2 A$

Table 1. Omnibus Tests of Model Coefficients

Step 1	Chi Square	DF	P Value
Step	154.909	23	0.001
Block	154.909	23	0.001
Model	154.909	23	0.001

Table 2. Model summary

Step	-2 loglikelihood	Cox & Snell R Square	Nagelkerke R Square
1	235.103	0.452	0.603

Table 3. Classification table

Observed	Predicted	
	ADHD	Percentage Correct
ADHD		
Hasn't	130	25
Has	31	114
Percentage	81.3	

According to above model, logistic regression analysis was done and to show how well this model has worked, we used Omnibus test. As table 1 shows, the complete model is significantly stable (df = 23; $P < 0.00004$; both = 154.909). Another part of data about the productivity of this model is provided in table 2. This table shows that the model contrasts about 0.45 to 0.60 percent of ADHD variance. Finally, according to table 3, it can be said that 83.9 percent of expectations for the group without ADHD and 78.6 percent for the group with ADHD are correct. As a matter of fact, generally the model has predicted correct results for 81.3 percent of children. In table 4, a set of significant levels have been determined for each variable. In logistic model, the

significant level of depression variable is 0.00001 and for the anxiety is 0.002 and both values are lower than the level of 0.05. These results reveal that depression and anxiety can anticipate the probably emergence of hyperactivity and attention deficit in children. Thus, the resulting model is as follow: $\text{Logit (Hyperactivity and Attention Deficit)} = -5.479 + 0.060 (\text{Anxiety}) + 0.406 (\text{Depression})$

It is to be noted that if depression and anxiety variables are replaced by their homogeneous numeric values, the final value for hyperactivity and attention deficit would be in (1,0). If the value is nearer to 1, we can anticipate that the child is suffering from hyperactivity and attention deficit disorder and in the case it is closer to 0

means he/she does not have this disorder. Moreover, regarding to the coefficients of depression and anxiety variables which are 0.06 and 0.406 respectively, both variables are in direct association with hyperactivity and attention deficit disorder. In other words, the more hyperactivity and attention deficit, the high is the rate of these two variables and vice versa.

To continue this issue, the difference between normal children and children with ADHD were reviewed. To test this theory, considering the two groups of one independent and discrete variable (normal children and children with ADHD) and two dependent and continuous variables (depression and anxiety), we used multivariate

analysis of variance (MANOVA). The results are presented in table 5 so that we can compare them in children with ADHD and the normal ones. According to the table 5 data, the significant levels of all tests show that there is a significant difference between children with ADHD and the normal ones in terms of synthetic dependent variables. Table 6 presents the final results of effects on the subjects.

As in table 6, there is a significant difference between children with ADHD and the normal ones in terms of depression and anxiety. According to the average scores, the rate of these disorders is higher in children with ADHD.

Table 4. Variables in the Equation

Variable	B	Wald	DF	P Value	Exp (B)	0.95 %C.I>for EXP(B)	
						Lower	Uper
Anxiety	0.06	9.97	1	0.002	1.062	1.023	1.103
Depression	0.406	41.72	1	0.001	1.50	1.69	1.32
Constant	-5.47	70.16	1	0.001	0.004		

Table 5. Manova results of research variables

Index	Value	DF	F	P Value
Pillai's Trace	0.43	2	115.6	0.001
Wilks' Lambda	0.56	2	115.6	0.001
Wilks' Lambda	0.77	2	115.6	0.001
Roy's Largest Root	0.77	2	115.6	0.001

Table 6. Analysis of between subjects effects on anxiety and depression

Variable	Sun of squares	DF	Mean of squares	F	P Value
Anxiety	11597.439	1	11597.439	116.348	0.001
Depression	3942.703	1	3942.703	201.066	0.001

DISCUSSION

The present research was aimed at studying the relation between anxiety and depression as determining factors of hyperactivity and attention deficit disorder in school aged children. Based on a descriptive analysis, there is a significant difference between children with ADHD and the normal ones in terms of depression and anxiety which can be the indicators of having ADHD disorder. The results are along with the results of other researches by different researchers validating their stability. To study the effects of anxiety and depression on attention deficit disorder, Najafi et al. (2009) conducted an analysis about school aged children. Their results state that anxiety and depression have a considerable share in comprehending the triple changes of hyperactivity, attention deficit and disruptive behavior and impulsivity. Also, Karustis et al. (2012) looked into ADHD in their researches under the title of "Anxiety and Depression in Children with Hyperactivity and Attention Deficit Disorder" in social and education based private administrations. Their tasks were aimed at reviewing the

relation between internal symptoms and disorder in educational and social performances over 125 elementary students with ADHD. Both factors were analyzed based on children and parents' reports and a number of methods were employed for assessment of educational and social skills. In general, social skills are basically in direct relation with depression and anxiety and the results exhibit the positive connection between anxiety and children's antisocial behaviors.

Tavakolyzadeh et al. (1998) also consider a correlation between the rate of the prevalence of these annoying behaviors and factors such as gender demography, education level, age, socioeconomic conditions of parents, psychiatric records of the subject's family (mother, father and the siblings). In a research aiming at identifying the rate of attention deficit prevalence among children, juveniles and adults in a sample including 300 subjects from visitors of psycho-health servicing center by the method of variance analysis, Biderman et al. (2005) concluded that the prevalence of this disorder is higher in childhood than any other period. Additionally, it was diagnosed more frequently in boys

than in girls. The applied tool was studying the record files of these three groups. Finally we can note that since there is not enough literature in this case, the present research can be considered as a good source in establishing the theoretical bases and further studies. However, this issue entails further researches.

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