

Original Article

Mental indicators in mothers with hyperactive and normal children

Azin Narimani¹, Mehrdad Mirzarahimi^{2*}, Mohammad Narimani³ & Parisa Ahadi⁴

1. Professional doctorate student, Department of Medicine, Ardabil Branch, Islamic Azad University, Ardabil, Iran.
2. Associate Professor, Department of Pediatrics, Faculty of Medical Sciences, Ardabil University of Medical Sciences, Ardabil, Iran.
3. Distinguished Professor, Department of Psychology, Faculty of Educational Sciences and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran.
4. Asistante Professor, Department of Pediatrics, Faculty of Medical Sciences, Ardabil University of Medical Sciences, Ardabil, Iran.

Abstract

Attention deficit/hyperactivity disorder is a very common disorder that is usually diagnosed in childhood. The present study was conducted with the aim of comparing mental indicators in mothers with hyperactive and normal children. The method of this research was causal-comparative. The population of the research included all mothers in Ardabil city in 2022. A sample of 50 mothers with hyperactive children were selected by availability sampling and 50 mothers with normal children were selected by purposive sampling from the relevant population as a comparison group and participated in the study. They answered the questionnaire of mental disorder and Connors parent rating scale in the presence of researchers. The collected data were also analyzed using descriptive statistics of mean, standard deviation, and multivariate analysis of variance through SPSS (25) software. The results of multivariate analysis of variance showed that there is a significant difference in average mental indices of interpersonal sensitivity ($F = 11.512$), depression ($F = 127.956$) and anxiety ($F = 42.468$) in mothers with hyperactive and normal children ($p < 0.001$). From a practical point of view, it is suggested that prevention strategies be taken to promote parents' mental health so that addressing parents' stress and anxiety can have long-term positive effects on children's health, well-being, and behavioral outcomes.

Keywords

Mental indicators
Hyperactivity
Mothers

Received: 2023/03/05

Accepted: 2023/09/02

Available Online: 2023/09/05

Introduction

Attention deficit hyperactivity disorder (ADHD) is characterized by high levels of inattention or hyperactivity/impulsivity that impairs daily, academic, occupational, and social functioning (American Psychiatric Association, 2013). It is a very common disorder that is usually diagnosed in childhood and often persists into adulthood (Joseph, Lorenzo, Wang, Wilson & Molina, 2022). The global prevalence rate in community studies is between 2.2 and 7.2 percent (Sayal, Prasad, Daley, Ford & Coghill, 2018). Children with this disorder have difficulty in regulating their emotions, activities, maintaining attention and impulse control, but clinically, it is a heterogeneous group, and some children are more impaired than others in inattention, hyperactivity, and impulsivity. Interventions include medication, child behavioral assessment, and parental

supervision (Barkley, 2006). It has been reported that children and adolescents with ADHD in a wide range of educational, family and social contexts have problems in interpersonal relationships and conflicting parent-child interactions. So they are at high lifelong risk of accident injury and problematic behaviors such as drug use, academic progress and occupational problems (Hinshaw, 2018) which leads to reduced health-related quality of life (Lee, Yang, Chen, Lee, & Teng, 2016).

The same as other psychiatric disorders, the causes of hyperactivity are complex and not well-understood. It is generally believed that this condition is heterogeneous and is caused by a combination of environmental and genetic factors (Azeredo, Moreira & Barbosa, 2018). Factors have been considered for hyperactivity disorder, especially genetics, in other words, ADHD is highly related to hereditary. According to evidence from genetic and molecular studies, significant volume reduction in the

cerebellum, basal ganglia, parietal, temporal and frontal lobes and changes in functional connectivity among these regions are the most common structural and functional abnormalities associated with hyperactivity (Wyciszkiewicz, Pawlak & Krawiec, 2017). Hyperactivity is caused by extensive and subtle changes in genes in different areas of the brain that affect brain function (Cortese, Kelly, Chabernaud, Proal, & Di Martino, 2012). A recent review of genetic studies by Faraone and Larsson (2019) in 37 twins with hyperactivity showed that the average contribution of heredity was 74%. On the other hand, environmental variables effective in the occurrence of ADHD are divided into two categories: biological and psychological factors (Banerjee, Middleton & Faraone, 2007). Psychological factors such as mental health problems of mothers and specifically symptoms of depression and anxiety are frequently and consistently associated with an increased risk of hyperactivity in children (Vizzini, Popovic, Zugna, Vitiello, & Trevisan, 2019). Raising children with attention deficit hyperactivity disorder can be stressful and may be a threat to parents' physical and mental health as well as marital and social well-being (Corcoran, Schildt, Hochbrueckner & Abell, 2017). Parental mental health refers to parents' thoughts, emotional regulation, and behaviors that reflect the psychological or biological processes underlying their mental functioning (American Psychiatric Association, 2013). Evidence has shown that mothers of children with ADHD have higher rates of psychopathology, especially depression and symptoms of attention deficit hyperactivity disorder (Sfelinoti & Livaditis, 2017). Fatima, Chinnakali, Rajaa, Menon, and Mondal (2021) reported that anxiety prevalence in mothers with and without hyperactive children is 43.3% and 15%, respectively, and depression prevalence is 37.5% and 12%. Robinson, Bitsko, O'Masta, Holbrook, and Ko (2022) reported that parental stress, depression, and antisocial personality disorder are positively related to children's hyperactivity. Parents of children with ADHD attribute high levels of stress to their children's behavior, unmet needs, and social labeling (Leitch, Sciberras, Post, Gerner, & Rinehart, 2019). Since the presence of a child with ADHD has negative effects on the lives of parents and family members and can have many long-term effects on family members, especially the mother, it is necessary to pay attention to the mental health of mothers and identify the factors. As a result, the present study was conducted with the aim of comparing mental indicators in mothers with hyperactive and normal children.

Method

Participants

The method of this research was causal-comparative. The population included all the mothers in Ardabil city in 2022. A sample of 50 mothers with hyperactive children were selected by availability sampling and 50

mothers with normal children were selected by purposive sampling from the population as a comparison group and participated in the study. They filled in the questionnaire of mental disorder and Connors parent rating scale in the presence of researchers.

The steps taken for data collection was as follows: First, to select the participants, by obtaining permission from Ardabil University of Medical Sciences, we were referred to treatment and counseling clinics. The selected sample for hyperactive children was among the available samples referring to the treatment clinics (Dr. Ahadi, Dr. Sadeghi, Dr. Shahriari, Dr. Tamadon and Dr. Khoshe) and counseling clinics (Shahriar, Zehne Ziba) in Ardabil city, which were assessed by the Connors parent rating scale. Then the final diagnosis was made by checking the information contained in the medical records of the children in the mentioned clinics and health centers and performing the test. In order to obtain the participants that would provide the possibility of proper statistical analysis, i.e. be in accordance with the requirements of this research (comparison in terms of age and gender of children), a list of normal schools in Ardabil at the primary school level was prepared through purposive sampling. After obtaining permission to attend and conduct the research, the list of students who, according to their parents, did not have any mentionable disorders, and also all the archived family files, were given to the researchers. Accordingly, 50 students were selected and hyperactivity and Connors' parent rating scale were used to check accompanying disorders in this group.

Instrument

Connors' parent rating scale:

Connors' parent rating scale (1997) has 26 items that are completed by the child's parents to diagnose hyperactivity. Parents score the questions on forms graded on a Likert scale. Therefore, the range of scores for each question ranges from 0 (Not true at all, or Never, Rarely) to 3 (Completely true, or Often, Almost always). Connors et al. (1997) reported the reliability of this scale as 0.90. The reliability of this questionnaire was reported 0.85 by the Institute of Cognitive Sciences (Alizadeh, 2005).

SCL-90 questionnaire:

The original form of the Revised Psychiatric Symptoms Checklist was prepared by Derogatis, Limpman and Covey (1973). Derogatis et al. (1984) revised this questionnaire and prepared its final form with the name of the Revised Checklist of Psychiatric Symptoms. This scale contains 90 five-point items (None, A little to some extent, Much, Very much). The scoring of the items in the mentioned scale is in such a way that "None" is given a score of zero, "A little" is given a score of one, "Somewhat" is given a score of two, "Much" is given a score of three, and "Very much" is

given a score of four.

The scoring of this instrument is done as follows:

A: Single-disorder symptomatology or distress index: In this section, the sum of the scores obtained from the items related to each disorder is divided by the number of items related to the same disorder. In this way, the average score for each disorder is obtained. If the average score of a person in each disorder is more than 2.5, it indicates that the person has a significant problem in that disorder. If the mentioned average is 3 or more, it means that the person's problem is serious in relation to that disorder.

B: General symptomatology or general index of disease symptoms: In this section, all the scores obtained from the participant's answers to all the items in the mentioned scale are added and then divided by the total number of the items. If the obtained average is between 90 and 200, it means that the person's problem is significant, and if the average is more than 200, it means that there is a serious mental problem in the person. The time required to complete the instrument is 12 to 15 minutes, but serious people may complete it in 30 minutes or more. In addition, if the participant does not answer more than 20% of all identifier items or more than 40% of the items of each dimension or each

disorder, the measurement or the desired dimension will be invalid. 90 items of this scale evaluate the person's state from one week before to the time of answering the questionnaire. The items of this scale measure nine different dimensions, including physical complaints, obsessive compulsive disorder, sensitivity in interpersonal relationships, depression, anxiety, aggression, pathological fear, paranoid thoughts and psychosis.

Procedure

SPSS software (version 25) was used for data analysis in order to provide descriptive statistics, numbers, percentage, mean and standard deviation. To provide inferential statistics, multivariate analysis of variance (MANOVA) was used.

Results

A total of 50 mothers with hyperactive children with an average age of 32.38 and a standard deviation of 4.83 and 50 mothers with normal children with an average age of 34.14 and a standard deviation of 6.67 participated in this study.

Table 1. Descriptive results for mental indicators sorted by research groups

Measured variable	Groups	K-S significance level	M	SD
Physical complaints	ADHD	0.60	32.00	11.54
	Normal	0.10	28.98	8.73
Obsessive compulsive disorder	ADHD	0.07	33.40	7.66
	Normal	0.11	31.02	9.47
Sensitivity in interpersonal relationships	ADHD	0.21	30.50	6.39
	Normal	0.17	21.54	17.54
Depression	ADHD	0.25	38.64	17.75
	Normal	0.15	9.10	5.06
Anxiety	ADHD	0.07	30.04	14.10
	Normal	0.14	15.50	7.06
Aggression	ADHD	0.24	11.86	9.53
	Normal	0.08	9.50	3.08
Pathological fear	ADHD	0.35	9.76	6.39
	Normal	0.06	8.12	2.73
Paranoid thoughts	ADHD	0.31	8.82	7.04
	Normal	0.11	7.60	5.14
Psychosis	ADHD	0.11	12.36	13.73
	Normal	0.38	10.08	8.12

Multivariate analysis of variance (MANOVA) was used to investigate the difference between the two groups. Before using this test, its assumptions were checked. One of the assumptions is the equality of the variance matrix and covariance. According to the Box test, the condition of homogeneity of the variance matrix and covariance has been correctly met ($p < 0.05$). Another assumption is homogeneity of error variances. Levene's

test showed that this assumption is met in the variables ($p < 0.05$); therefore, multivariate variance analysis was performed and the results indicated a significant difference in the linear combination of components in the two groups ($p < 0.001$; $F = 18.053$; Wilks' Lambda = 0.356). MANOVA as described in Table 2 was used to examine the difference patterns.

Table 2. Results of MANOVA for mental indicators in mothers with hyperactive and normal children

Resource	Dependent variable	sum of squares	Df	MS	F	p- value	Squares
Groups	Physical complaints	228.010	1	228.010	2.183	0.143	0.022
	Obsessive compulsive disorder	141.610	1	141.610	1.911	0.170	0.019
	Sensitivity in interpersonal relationships	2007.040	1	2007.040	11.512	0.001	0.105
	Depression	21815.290	1	21815.290	127.956	0.001	0.57
	Anxiety	5285.290	1	5285.290	42.468	0.001	0.30
	Aggression	282.240	1	282.240	4.833	0.30	0.04
	Pathological fear	67.240	1	67.240	2.785	0.09	0.02
	Paranoid thoughts	37.210	1	37.210	0.978	0.325	0.01
	Psychosis	129.960	1	129.960	1.02	0.315	0.01

The results of the analysis in Table 2 shows that mothers with hyperactive children have a significant difference in the average mental indices of interpersonal sensitivity ($F = 11.512$), depression ($F = 127.956$) and anxiety ($F = 42.468$) compared with the normal group. In other words, mothers with hyperactive children had higher average scores in the mentioned mental indices than the normal group ($p < 0.001$).

Discussion

ADHD is a debilitating neurodevelopmental disorder that has major undesirable consequences for individuals and their families. The present study was conducted with the aim of comparing mental indicators in mothers with hyperactive and normal children.

The results of MANOVA indicated that there is a significant difference between mental indicators (sensitivity in interpersonal relationships, depression and anxiety) among mothers with hyperactive and normal children. These results are consistent with the results of studies by [Vizzini et al. \(2019\)](#), [Leitch et al. \(2019\)](#) and [Corcoran et al. \(2017\)](#) and accordingly, raising children with ADHD can be a stressful experience and may pose a threat to the physical and mental health of parents as well as their marital and social well-being. In addition, [Fatima et al. \(2021\)](#) reported that anxiety in mothers with hyperactive children is more than mothers with normal children, and [Robinson et al. \(2022\)](#) showed that stress, depression, and antisocial personality disorder of parents have a positive relationship with children's hyperactivity. Therefore, it can be stated that since children with ADHD may find it difficult to calm down, have sleep problems, and may have social learning problems ([Barkley, 1994](#)), this may affect the parents' sense of self-worth and their ability to being better parents. Parents may blame the child or themselves and then feel guilty or withdrawn, resulting in further mental turmoil. In other words, since ADHD children have many behavioral problems, their parents are more stressed than parents of normal children. Stress in the context of family, especially when it is chronic and present in the early stages of growth, has harmful effects on the health of parents, children, and parent-child relationships ([Abidin, 1990](#)).

According to [Johnston \(1992\)](#), parents with ADHD children show more negative reactions to their children and adopt less positive options. It can be said that

because mothers of hyperactive children face more educational challenges, they have more stress and anxiety than mothers of normal children. Evidence has also shown that mothers of children with ADHD have a higher rate of psychopathology, especially depression ([Sfelinioti et al., 2017](#)). Raising a child with ADHD is challenging because its symptoms are associated with dysfunctional behaviors (e.g., noncompliance with parental instructions, distraction that prevents task completion) that create high levels of challenge to family life ([Johnston & Mash, 2001](#)). In this way, the inability of a child with hyperactivity to fulfill the mother's wishes may be disappointing for the mother and is accompanied by an increase in mother's stress and anxiety.

The mere use of a questionnaire to evaluate indicators of mental disorder and conducting research in one geographical area were the two major limitations of the present study. Theoretically, it is suggested for the future studies to achieve better results from different measurement methods (interview and clinical observation), and not use self-report scales only and conduct research in other geographical areas and compare its results with the results of the current research.

Conclusion

In general, the results of the present study showed that there is a significant difference between the mental indicators of mothers with hyperactive and normal children. From a practical point of view, it is suggested that prevention strategies be taken to promote parents' mental health and address parents' stress and anxiety to have long-term positive effects on children's health, well-being, and behavioral outcomes.

Acknowledgments

By this way, all the compassionate cooperation of the director, counselor and instructors of the schools and medical and counseling clinics of Ardabil and all the mothers participating in the research are highly appreciated

Disclosure Statement

No potential conflicts of interest are reported by the authors.

ORCID

Mehrdad Mirzarahimi: <https://orcid.org/0000-0002-7369-4942>

References

- Abidin, R.R. (1990). Introduction to the special issue: The stresses of parenting. *Journal of Clinical Child Psychology*, 19, 298–301. doi:abs/10.1207/s15374424jccp1904_1
- Alizadeh, H. (2005). A theoretical explanation on attention deficit/hyperactivity disorder: behavioral inhibition model and nature of self-control. *Journal of Exceptional Children*, 5(3), 231-252. doi:2.1001.1.16826612.1384.5.3.5
- American Psychiatric Association (2013). Diagnostic and Statistical Manual of Mental Disorders, 5th ed. Author, Arlington, VA
- Azeredo, A. Moreira, D. & Barbosa, F. (2018). ADHD, CD, and ODD: Systematic review of genetic and environmental risk factors. *Research in Developmental Disabilities*, 82, 10-19. doi:10.1016/j.ridd.2017.12.010
- Banerjee, T. D. Middleton, F. & Faraone, S. V. (2007). Environmental risk factors for attention-deficit hyperactivity disorder. *Acta Paediatrica*, 96(9), 1269-1274. doi:10.1111/j.1651-2227.2007.00430.x
- Barkley, R. A. & Poillion, M. J. (1994). Attention deficit hyperactivity disorder: a handbook for diagnosis and treatment. *Behavioral Disorders*, 19(2), 150-152.
- Barkley, R. A. (2006). Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment. New York, NY: Guilford Press
- Conners, C. K. (1997). Conners' rating scales-revised, technical manual. Multi-Health Systems.
- Cortese, S. Kelly, C. Chabernaud, C. Proal, E. Di Martino, A. Milham, M. P. & Castellanos, F. X. (2012). Toward systems neuroscience of ADHD: a meta-analysis of 55 fMRI studies. *American Journal of Psychiatry*, 169(10), 1038-1055. doi:10.1176/appi.ajp.2012.11101521
- Derogatis, L. R. & Lipman, R. S. (1973). Scale: Preliminary report. *Psychopharmacology Bulletin*, 9. <https://pubmed.ncbi.nlm.nih.gov/4682398/>
- Derogatis, L. R. (1973). SCL-90: an outpatient psychiatric rating scale-preliminary report. *Psychopharmacol Bull*, 9, 13-28. <https://cir.nii.ac.jp/crid/1573950399060414208>
- Faraone, S. V. & Larsson, H. (2019). Genetics of attention deficit hyperactivity disorder. *Molecular psychiatry*, 24(4), 562-575. doi:10.1038/s41380-018-0070-0
- Fatima, N. Chinnakali, P. Rajaa, S. Menon, V. Mondal, N. & Chandrasekaran, V. (2021). Prevalence of depression and anxiety among mothers of children with neuro-developmental disorders at a tertiary care center, Puducherry. *Clinical Epidemiology and Global Health*, 11, 100792. doi:10.1016/j.cegh.2021.100792
- Hinshaw, S. P. (2018). Attention deficit hyperactivity disorder (ADHD): Controversy, developmental mechanisms, and multiple levels of analysis. *Annual Review of Clinical Psychology*, 14, 291–316. doi:10.1146/annurev-clinpsy-050817-084917
- Johnston, C. & Mash, E. E. (2001). Families of children with attention deficit/hyperactivity disorder: Review and recommendations for future research. *Clinic Child and Family Psychology Review*, 4(3), 183-207. doi:10.1023/a:1017592030434
- Joseph, H.M. Lorenzo, N. E. Wang, F. L. Wilson, M.A. Molina, B.S.G. (2022). The interaction between infant negative emotionality and cognition predicts ADHD-related behaviors in toddlerhood. *Infant Behavior Development*. 68,101742. doi:10.1016/j.infbeh.2022.101742
- Lee, Y. C. Yang, H. J. Chen, V. C. Lee, W. T. Teng, M. J. Lin, C. H. et al. (2016). Meta-analysis of quality of life in children and adolescents with ADHD: By both parent proxy-report and child self-report using PedsQL. *Research in Developmental Disabilities*, 51–52, 160–172. doi:10.1016/j.ridd.2015.11.009.
- Leitch, S. Sciberras, E. Post, B. Gerner, B. Rinehart, N. Nicholson, J. M. & Evans, S. (2019). Experience of stress in parents of children with ADHD: A qualitative study. *International Journal of Qualitative Studies on Health and Well-being*, 14(1), 1690091. doi:10.1080/17482631.2019.1690091
- Robinson, L. R. Bitsko, R. H. O'Masta, B. Holbrook, J. R. Ko, J. Barry, C. M. ... & Kaminski, J. W. (2022). A systematic review and meta-analysis of parental depression, antidepressant usage, antisocial personality disorder, and stress and anxiety as risk factors for attention-deficit/hyperactivity disorder (ADHD) in children. *Prevention Science*, 1-19. doi:10.1007/s11121-022-01383-3
- Sayal, K. Prasad, V. Daley, D. Ford, T. & Coghill, D. (2018). ADHD in children and young people: Prevalence, care pathways, and service provision. *The Lancet Psychiatry*, 5(2), 175–186. doi:10.1016/s2215-0366(17)30167-0
- Vizzini, L. Popovic, M. Zugna, D. Vitiello, B. Trevisan, M. Pizzi, C. ... & Richiardi, L. (2019). Maternal anxiety, depression and sleep disorders before and during pregnancy, and preschool ADHD symptoms in the NINFEA birth cohort study. *Epidemiology and Psychiatric Sciences*, 28(5), 521-531. doi:10.1017/s2045796018000185
- Wyciszkiewicz, A. Pawlak, M. A. & Krawiec, K. (2017). Cerebellar volume in children with attention-deficit hyperactivity disorder (ADHD) replication study. *Journal of Child Neurology*, 32(2), 215-221. doi:10.1177/0883073816678550