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Examining the Relationship Between Symptoms of Attention-Deficit/Hyperactivity Disorder and Academic Achievement with Parental Expressed Emotion in Students

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ABSTRACT

Introduction and Objective: Attention-Deficit/Hyperactivity Disorder (ADHD) is a common childhood disorder, and its primary symptoms include inattention, impulsivity, and hyperactivity. The present study investigated the relationship between ADHD symptoms and academic achievement with parental expressed emotion among students in Ardabil Province.
Research Method: This was a descriptive cross-sectional study with convenience sampling. The study population consisted of 1,864 tenth and eleventh-grade students in Ardabil during the 2021-2022 academic year. Data were collected using the Adult ADHD Self-Report Scale (ASRS) (Kessler et al.) and the Emotional Expressiveness Questionnaire (EEQ) (King & Emmons). Data analysis was performed using SPSS version 27, employing descriptive statistics, regression, and F-tests.
Findings: Results showed that the F-test for the positive expressed emotion component was significant at a 95% confidence level ($p < 0.05$), indicating a relationship between academic achievement and positive expressed emotion. Additionally, ADHD significantly predicted negative expressed emotion and total expressed emotion ($p < 0.01$).
Conclusion: There was a significant relationship between ADHD symptoms, parental expressed emotion, and students' academic achievement. Given the importance of family in adolescent development and mental health, training in emotion management for both parents and students is essential.

Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common childhood disorder (Athanasiadou et al., 2020), with core symptoms including inattention, impulsivity, and hyperactivity. These symptoms must be present before age 12, persist for at least six months, and interfere with daily functioning to warrant an ADHD diagnosis.

The prevalence of ADHD in childhood is 7.6%, in adolescence 5.6% (Salari et al., 2023), and in adulthood 2.58% (Song et al., 2021). A study in Ardabil estimated the combined type of ADHD prevalence at 6.75% in boys and 6.31% in girls, the inattentive type at 3.79% in boys and 4.39% in girls, and the hyperactive-impulsive type at 2.53% in boys and 2.91% in girls (Bayat et al., 2023). Another study reported an ADHD prevalence of 13.5% among university students in Isfahan using the Barkley questionnaire (Moradi Siah Afshadi et al., 2022).

Academic difficulties are common in individuals with ADHD (Arnold et al., 2020). ADHD negatively impacts academic achievement (Jangmo et al., 2019; Arnold et al., 2015) and is associated with lower school performance (Trane & Willcutt, 2023; Rigoni et al., 2020; Behpooya et al., 2016; Wu & Gau, 2013; McConaughy et al., 2011), deficits in reading, writing, and math (Lawrence et al., 2021; Czamara et al., 2013), lower GPAs (Kent et al., 2011), and reduced homework completion (Langberg et al., 2016). ADHD-related academic struggles are primarily linked to inattention rather than hyperactivity-impulsivity (Henning et al., 2022; Öner et al., 2019; Merrell et al., 2017; Salla et al., 2016; Pingault et al., 2011). Barkley suggests that inattention in these children may result in slower cognitive processing of thoughts, emotions, events, and academic material (Lovecky, 2023). He estimates that 90% of children with ADHD experience executive function difficulties (Dendy & Hughes, 2023). Executive functions are cognitive processes responsible for goal-directed behavior and problem-solving (Shad & Dogan, 2020) and include working memory, inhibitory control, and cognitive flexibility (Kimbarow & Wallace, 2023). Executive dysfunction and working memory deficits are associated with poor academic performance (Ramos-Galarza et al., 2020; Simone et al., 2018). Classroom environments that require sitting still, silence, and sustained focus may exacerbate ADHD symptoms, which can then be reinforced through labeling, negative self-perception, and strained teacher-student relationships (Gwernan-Jones et al., 2016).

Genetics play a significant role in ADHD, and environmental factors such as prenatal toxin exposure and preterm birth increase risk (Anderson, 2023). Behavioral problems in children with ADHD can affect parental behavior and adjustment, while parenting challenges may worsen child behavior and disorder progression (Salcuni et al., 2021). ADHD in children is associated with family conflict, stress, increased punishment, and reduced parental self-efficacy (Barkley, 2018). Parental expressed emotion is a key factor linked to ADHD (Musser et al., 2016; Cartwright, 2013; Keown, 2012; Peris & Hinshaw, 2003).

Expressed emotions refer to the attitudes of family members toward an individual, reflected through their comments and behaviors. Negative expressed emotions (EE) involve critical comments, hostility, and excessive emotional involvement or overprotectiveness, while positive expressed emotions refer to the expression of positive emotions such as affection and empathy toward the individual with mental illness (Group, 2015). Negative parental EE is associated with higher levels of ADHD symptoms in children (Brinksma et al., 2021), whereas parental sensitivity and warmth are inversely related to ADHD symptoms (Claussen et al., 2022; Shelleby & Ogg, 2020). Parental EE may moderate the genetic effects of ADHD, with maternal warmth potentially preventing the worsening of ADHD or the development of conduct disorder (Corcoran & Walsh, 2010). Parenting training improves

parenting styles (Vahid & Khanjani, 2014) and alleviates symptoms of this disorder (Sheikhi Valayeshani & Javazadeh Shahshahani, 2020).

Parental EE is also linked to academic achievement (Moed et al., 2017). Parental acceptance and warmth are positively associated with academic success (Sultana & Rabeasani, 2022; Parmar & Nathans, 2022; Hadjicharalambous & Demetriou, 2020; Pinquart, 2016; Uddin, 2011), whereas parental rejection and lack of affection are negatively correlated with children's academic performance (Yeo & Chan, 2020; Sultana et al., 2018). According to Zoughi Paydar et al. (2015), controlling parenting styles and parental stress are inversely related to the academic performance of children with ADHD. Parenting training for mothers of children with ADHD improves maternal mental health (Haji Babaei Ravandi et al., 2022; Jafari et al., 2010) and reduces behavioral problems while enhancing children's academic performance (Madani & Pour Nemat, 2020).

Given the above, it can be argued that children and adolescents with attention-deficit/hyperactivity disorder (ADHD) often face academic difficulties due to their limitations, and various factors influence the severity of these challenges. One factor strongly associated with ADHD, based on research, is parental EE. Given the limited research in Iran on the relationship between ADHD and academic achievement in relation to parental EE, this study aims to examine the association between ADHD symptoms, academic achievement, and parental EE in students. Conducting such research increases societal awareness of ADHD symptoms and aids in planning preventive measures or mitigating its consequences.

Method

This study was descriptive and cross-sectional .Population, Sample, and Sampling Method: The study population consisted of 1,864 10th- and 11th-grade students in Ardabil during the 2021–2022 academic year, of whom 443 (237 boys and 206 girls) were selected. A cluster random sampling method was used, with four boys' and four girls' schools in each district. Three boys' and three girls' schools were selected from each district. From each school, two classes (humanities, experimental sciences, and mathematics) were randomly selected, and all students in those classes participated. Inclusion criteria included informed consent, absence of specified acute or chronic illnesses, being in 12th grade, and having both parents alive. Exclusion criteria included chronic illness and lack of informed consent. The following tools were used for data collection:

Adult ADHD Self-Report Scale (ASRS): Developed by the World Health Organization in 2003, this 18-item scale is used for rapid screening in group and individual assessments. The first nine items assess inattention, and the remaining nine assess hyperactivity-impulsivity. Responses are scored on a 5-point Likert scale from "never" (0) to "very often" (4). A total score of 0–16 indicates no ADHD, 17–23 suggests probable ADHD, and 24 or higher indicates ADHD (Mokhtari et al., 2015). External validation studies confirm high reliability, with internal consistency ranging from 0.63 to 0.72 and test-retest reliability (Pearson correlation) between 0.58 and 0.77. The scale has 87% sensitivity and has been validated in 28 countries, including Canada, the U.S., Japan, and France (Kessler et al., 2007). In a standardization study by Mokhtari et al. (2015) on 340 Iranians (aged 18–45) in Mashhad, the ASRS showed concurrent validity with the Conners Adult ADHD Rating Scale ($r = 0.67$, $p < 0.01$) and a Cronbach’s alpha of 0.87.

King and Emmons Emotional Expressiveness Questionnaire (EEQ): Developed by King & Emmons (1990), this 16-item questionnaire assesses emotional expressiveness in three subscales: positive emotional expression (7 items), intimacy expression (5 items), and negative emotional expression (4 items). Responses are scored on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"). King & Emmons (1990, cited in Rafieinia, 2002) reported Cronbach’s alpha values of 0.70 (total

scale), 0.74 (positive expression), 0.63 (intimacy), and 0.67 (negative expression). Convergent validity was established through positive correlations with the Multidimensional Personality Questionnaire and the Bradburn Positive Affect Scale. Rafieinia (2002) reported Cronbach's alpha values of 0.68 (total scale), 0.65 (positive expression), 0.59 (intimacy), and 0.68 (negative expression), all significant ($p < 0.001$).

Procedure: After obtaining approval from the Ardabil Department of Education, a list of all secondary schools was obtained. Questionnaires, along with demographic information (grade, gender, birth order, parental education, family size, and economic status), were administered in a group self-report format. Economic status was categorized as: poor (<10 million rials/month), middle-class (10–30 million rials/month), and affluent (>30 million rials/month). Of 520 distributed questionnaires (260 for boys, 260 for girls), 443 were retained after excluding incomplete responses (237 boys, 206 girls).

Statistical Analysis: Descriptive statistics (frequency, mean, standard deviation, skewness, kurtosis) and inferential statistics (Pearson correlation, multiple linear regression) were used. Data were analyzed using SPSS-27.

Findings

Table 1 presents the demographic characteristics of participants (grade, gender, birth order, parental education, family size, and economic status).

Table 1 - Frequency table of gender, educational level, number of children, parents' education, parents' age, number of children, and economic status of respondents

Percentage of frequency	Number		Variable
55.6	232	Boy	Gender
44.4	185	Girl	
77.2	322	twelfth	Educational background
22.8	95	Eleventh	
7.7	32	Weak	Economic situation
67.6	282	Medium	
24.7	103	Good	

The results of Table 1 show that 232 boys and 185 girls participated in the study. In terms of educational level, 322 were in 12th grade and 95 were in 11th grade, and the economic status of the family was poor for 32, average for 282, and good for 103.

Description of the main variables

Table 2 describes the main variables. The main variables were described using the mean, standard deviation, and minimum and maximum values. Table 2- Descriptive statistics of the main variables

The most	The lowest	Standard deviation	Average	Variables
47	1	9/344	24/209	Attention deficit hyperactivity disorder
20	15	1/252	18/51	Academic progress
35	11	4/361	23/851	Positive instrumental excitement
50	5	2/856	94/12	Negative instrumental emotion
24	8	2/808	15/71	Excitement is the instrument of intimacy
47	1	7/011	52/512	Instrumental excitement (total)

Table 2 showed that the mean of ADHD was 24.209 with a standard deviation of 9.344. The mean and standard deviation of academic achievement were 18.51 and 1.252, respectively. The mean of the positive instrumental emotion component was 23.851 with a standard deviation of 4.361, and the mean of the negative instrumental emotion component was 12.94 with a standard deviation of 2.856, and the mean of the intimacy instrumental emotion component was 15.71 with a standard deviation of 2.808, and the mean of the total expressed emotion was 52.512 with a standard deviation of 7.011.

Normality of variables

The normality of the distribution shape of the variables was assessed with skewness and kurtosis indices, and the results are given in Table 4-3. Regarding skewness and kurtosis, If the values of these statistics are -1 and +1 indicate that the distribution of the single variable is normal.

Table 3- Checking the normality of the distribution shape of variables with skewness and kurtosis indices

Elongation	Skewness	Variables
-0/272	153/0-	Attention deficit hyperactivity disorder
0/269	0.92-	Academic progress
-067/0	27/0-	Positive instrumental excitement
0/139-	005/0	Negative instrumental emotion
-002/0	019-0/0	Excitement is the instrument of intimacy
-316/0	-096/0	Instrumental excitement (total)

Examination of the skewness and kurtosis values (Table 3) showed that the skewness and kurtosis values of all research variables were in the range of +1 to -1, and based on this, it can be concluded that all variables have a normal distribution. According to the results, parametric tests (Pearson correlation and multiple linear regression) can be used to test the hypotheses.

Multiple collinearity

The phenomenon of multiple collinearity It occurs when a researcher in a study It uses two overlapping variables that actually measure the same thing (Klein, 2005). Multiple collinearity It is identified

through tolerance and variance inflation factor. (Klein, 2005). Tolerance value less than 0.1 or variance inflation factor More than 10 indicates multiple collinearity (Kline, 2005). In this analysis, none of the values of tolerance and variance inflation statistics calculated for the research variables deviated from the assumption of multiple collinearity. Not observed (Table 4) .

Table4 Colinearity test of the research predictor variables

Collinearity Statistics		Variable	
Tolerance	VIF	Foresee	Criteria
0/985	1/015	Attention deficit hyperactivity disorder	Expressed excitement
0/985	1/015	Academic progress	

Given that the research hypotheses are relational and parametric, we use the Pearson correlation coefficient to test the hypotheses of this study.

Inferential findings

In the inferential findings section, using the Pearson correlation test and regression test Multiple linear regression was used to examine the relationships between variables. In examining research variables First, the correlation matrix between variables is presented using the Pearson correlation coefficient test, and then the variables are examined using multiple regression (simultaneous method).

Table5 Pearson correlation matrix between main variables

6	5	4	3	2	1	Variables
					1	Attention deficit hyperactivity disorder -1
				1	121* 0/ -	Academic progress -2
			1	101*0/	44 0/	Positive instrumental emotion -3
		1	148**0/	033 0/	202**0/	Negative instrumental emotion -4
	1	141**0/	332**0/	024 0/	075 0/	The thrill of intimacy -5
1	664**0/	556**0/	816**0/	086 0/	14**0/	Instrumental Emotion (Total) -6
P< 0.05, P <0.01						

The results of Table 4-5 showed that at the 95% confidence level, there is a significant relationship between ADHD and academic achievement ($p < 0.05$), with a negative direction and a relationship intensity of 0.121. A significant correlation was observed between ADHD and the negative instrumental emotion component and total instrumental emotion ($p < 0.01$), with a positive direction and relationship intensity of 0.202 and 0.14, respectively.

The results of Table 4-5 showed that at a 95% confidence level, there is a significant relationship between academic achievement and expressed positive emotion ($p < 0.05$), with a positive direction and a relationship intensity of 0.101.

The results of Table 4-5 showed that a significant correlation was observed between the positive expressed emotion component and the negative instrumental emotion component, intimacy, and total instrumental emotion ($p < 0.01$), with the direction of the positive relationship and the intensity of the relationship being equal to 0.148, 0.332, and 0.816, respectively.

The results of Table 4-5 showed that a significant correlation was observed between the negative expressed emotion component and the instrumental emotion component of intimacy and total instrumental emotion ($p < 0.01$), with the direction of the positive relationship and the intensity of the relationship being equal to 0.141 and 0.556, respectively. A significant correlation was also observed between the expressed emotion component of intimacy and total instrumental emotion ($p < 0.01$), with the direction of the positive relationship and the intensity of the relationship being equal to 0.664.

The role of the predictor variable between ADHD and attention deficit in predicting expressed emotion and its components was also tested by simple regression method. The regression implementation method is the simultaneous method (Enter). The results of the examination of the assumption of independence of residuals (Watson camera), model fit indices (ANOVA test and coefficient of determination) are given in Table 5.

Table 6 - Fit statistics and regression assumptions

Watson's camera stats	Coefficient of determination)R^2(	Multiple correlation coefficient)R(	ANOVA test		Criterion variable
			p value-	F value-	
1/453	0/002	0/044	0/367	0/817	Positive instrumental excitement
0/643	0/041	0/202	0/000	17/737	Negative instrumental emotion
0/014	0/006	0/075	0/125	2/368	Excitement is the instrument of .intimacy
0/703	0/02	0/14	0/004	8/313	Instrumental excitement (total)

According to the results of Table 6, the F -test value for the negative expressed emotion component and total expressed emotion shows that it is significant at a confidence level of at least 95 percent ($p < 0.05$), and it can be concluded that there is a relationship between the predictor variable of attention deficit hyperactivity disorder and the negative expressed emotion component and total expressed emotion, and the model fit for these variables was confirmed.

Amount R2 Or the coefficient of determination, the amount of variance of the negative expressed emotion component and the total expressed emotion that is explained by the variable Predicting attention deficit hyperactivity disorder The adjusted coefficient of determination for the negative expressed emotion component was 0.041, and as a result, the attention deficit hyperactivity disorder variable was able to explain 1.4 percent of the variance in the negative expressed emotion component. The adjusted coefficient of determination for total expressed emotion was 0.02, and as a result, the attention deficit hyperactivity disorder variable was able to explain 2 percent of the variance in total expressed emotion.

To check the independence of error values (the absence of serial correlation between residuals or errors), the Durbin Watson test is used. The value of this statistic in the regressions performed was in the range of 1.5 to 2.5, indicating that the residuals are independent and there is no serial correlation between them.

Table 7 - Table of coefficients of the regression test aimed at predicting expressed emotion and its components on the predictor variable of attention deficit hyperactivity disorder

p value-	t value-	Standard impact factor	Non-standard impact factor		Criterion variable	Predictor variable
		Beta	Standard error	B		
000 0/	318 /39		594 /0	350 /23	Positive instrumental excitement	Fixed value
367 0/	904 /0	044 0/	023 0/	021 0/		Attention deficit hyperactivity disorder
000 0/	024 /30		381 /0	447 /11	Negative instrumental emotion	Fixed value
000 0/	212 /4	202 0/	015 0/	062 0/		Attention deficit hyperactivity disorder
000 0/	734 /39	-	382 /0	167 /15	Excitement is the instrument .of intimacy	Fixed value
125 0/	539 /1	075 0/	015 0/	023 0/		Attention deficit hyperactivity disorder
0/000	52/805	-	0/946	49/966	Total instrumental excitement	Fixed value
0/004	2/883	0/14	0/036	0/105		Attention deficit hyperactivity disorder

The regression test results in Table 7 showed that the predictive role of Attention deficit hyperactivity disorder The prediction of the negative expressed emotion component and the total expressed emotion component was confirmed ($p < 0.01$). Based on this, it can be concluded that attention deficit hyperactivity disorder is associated with the negative expressed emotion component. Negative expressed emotion and total expressed emotion are related, and the direction of the relationship is positive.

The role of the predictor variable of academic achievement in predicting expressed emotion and its components was also tested by simple regression method. The regression implementation method is the simultaneous method (Enter). The results of examining the assumption of independence of residuals (Watson camera), model fit indices (ANOVA test and coefficient of determination) are given in Table 4-8.

Table 8- Fit statistics and regression assumptions

Watson's camera stats	Coefficient of determination)R^2(	Multiple correlation coefficient)R(	ANOVA test		Criterion variable
			p value-	F value-	
1/414	0/01	0/101	0/039	4/284	Positive instrumental excitement
0/613	0/001	0/033	0/496	0/464	Negative instrumental emotion
0/005	0/001	0/024	0/631	0/231	Excitement is the instrument of .intimacy
0/637	0/007	0/086	0/08	3/081	Instrumental excitement (total)

According to the results of Table 8 the F -test value for the positive expressed emotion component shows that it is significant at a confidence level of at least 95 percent ($p < 0.05$), and it can be concluded that there is a relationship between the predictor variable of academic achievement and the positive expressed emotion component, and the model fit for this variable was confirmed.

Amount R2 Or the coefficient of determination, the amount of variance of the expressed positive emotion component that is explained by the variable Predicting academic progress The adjusted coefficient of determination for the expressed positive emotion component was 0.01, and as a result, the educational achievement variable was able to explain 1 percent of the variance of the expressed positive emotion component.

To check the independence of error values (the absence of serial correlation between residuals or errors), the Durbin Watson test is used. The value of this statistic in the regressions performed was in the range of 1.5 to 2.5, indicating that the residuals are independent and there is no serial correlation between them.

Table 9 - Table of coefficients of the regression test aimed at predicting expressed emotion and its components on the predictor variable of academic achievement

p value-	t value-	Standard impact factor	Non-standard impact factor		Criterion variable	Predictor variable
		Beta	Standard error	B		
000 0/	493 /5		156 /3	334 /17	Positive instrumental excitement	Fixed value
039 0/	07 /2	101 0/	17 0/	352 0/		Academic progress
000 0/	556 /5		076 /2	535 /11	Negative instrumental emotion	Fixed value
496 0/	681 /0	033 0/	112 0/	076 0/		Academic progress

0 000/	217 /7	-	042 /2	736 /14	Excitement is the instrument .of intimacy	Fixed value
631 0/	481 /0	024 0/	110 0/	053 0/		Academic progress
0/000	8/585	-	5/08	43/615	Total instrumental excitement	Fixed value
0/08	1/755	0/086	0/247	0/481		Academic progress

The regression test results in Table 9 showed that the predictive role of Academic achievement was positively confirmed in predicting the expressed emotion component ($p < 0.05$). Accordingly, it can be concluded that academic achievement With component Expressed emotion is positively related, and the direction of the relationship is positive.

Discussion and Conclusion

The aim of this study was to investigate the relationship between symptoms of attention-deficit/hyperactivity disorder (ADHD) and academic achievement in students, as well as the role of parental expressed emotion. Based on the results, there was a significant negative correlation between ADHD and academic achievement. The findings indicated that the F-test for the positive expressed emotion component was significant at a minimum confidence level of 95% ($p < 0.05$), suggesting that academic achievement is related to positive expressed emotion. Additionally, ADHD played a predictive role in negative expressed emotion and total expressed emotion ($p < 0.01$).

These findings align with other studies demonstrating that ADHD negatively impacts academic achievement (Jangmo et al., 2019; Arnold et al., 2015) and is associated with poorer school performance (Trane & Willcutt, 2023; Rigoni et al., 2020; Behpooya et al., 2016; Wu & Gau, 2013; McConaughy et al., 2011). Academic difficulties in children with ADHD are primarily linked to inattention symptoms (Henning et al., 2022; Öner et al., 2019; Merrell et al., 2017; Salla et al., 2016; Pingault et al., 2011). According to Barkley, inattention in these individuals may lead to weaker cognitive processing of thoughts, emotions, and academic material (Lovecky, 2023) and is often associated with impaired executive functions (Dendy & Hughes, 2023). Deficits in executive functions and working memory are correlated with poor academic performance (Ramos-Galarza et al., 2020; Simone et al., 2018). Executive functions include working memory, analytical and synthesis abilities, interpretation, summarization, organization of thoughts, prioritization, planning, problem-solving, and time management (Dendy & Hughes, 2023). Working memory is crucial for understanding events over time. Many daily tasks, such as comprehending spoken or written language, following instructions, sequencing activities, and performing calculations, rely on working memory (Kimbarow & Wallace, 2023). Since students utilize executive functions to address academic challenges, impairments in these functions can lead to academic decline.

ADHD symptoms may be exacerbated by classroom environments that require students to remain quiet, focused, and seated. These symptoms may also worsen due to labeling, self-perceived vulnerability, and poor interpersonal relationships (Gwernan-Jones et al., 2016), which could further explain the study's findings.

Another key finding was the significant positive correlation between academic achievement and positive expressed emotion. This result is consistent with studies reporting that parental acceptance and warmth are positively associated with children's academic success (Sultana & Rabeasani, 2022;

Parmar & Nathans, 2022; Hadjicharalambous & Demetriou, 2020; Pinquart, 2016; Uddin, 2011). Baumrind (1978) suggested that children of authoritative parents—who exhibit high warmth and low control—perform better than those raised by permissive or authoritarian parents. These children demonstrate higher social skills, adherence to rules, respect for others, cooperation, and the ability to form lasting friendships. Families provide learning stimuli that significantly shape children's behavior and personality. When children receive parental support, they engage more actively in school (Hadjicharalambous & Demetriou, 2020). Parent training for mothers of children with ADHD improves maternal mental health (Haji Babaei Ravandi et al., 2022; Jafari et al., 2010) and reduces behavioral problems while enhancing academic performance (Madani & Pour Nemat, 2020).

The final finding revealed a significant positive correlation between ADHD and negative expressed emotion. This aligns with studies indicating that negative parental emotions are positively associated with ADHD symptoms (Brinksma et al., 2021), while parental warmth is negatively correlated with ADHD symptoms (Claussen et al., 2022; Shelleby & Ogg, 2020). Behavioral issues in children with ADHD can influence parental behavior and adjustment, while parenting challenges may exacerbate the disorder's progression (Salcuni et al., 2021). ADHD in children is associated with family tension, stress, increased commands and punishments, and reduced parental self-efficacy (Barkley, 2018). Thus, parenting styles and child behavior may reinforce each other in a negative cycle. Additionally, maternal warmth may mitigate the severity of ADHD or prevent conduct disorders (Corcoran & Walsh, 2010). Parent training can improve parenting styles (Vahid & Khanjani, 2014) and reduce ADHD symptoms (Sheikhi Valayeshani & Javazadeh Shahshahani, 2020).

In summary, the study found:

A negative correlation between ADHD and academic achievement.

A positive correlation between academic achievement and positive expressed emotion.

A positive correlation between ADHD and negative expressed emotion.

Parental expressed emotion is linked to both ADHD and academic achievement. This research can assist mental health professionals in developing educational programs to enhance parenting skills and promote positive emotional expression in parents of children with ADHD.

Limitations and Future Research

Future studies should explore the relationship between socioeconomic status, parental education, age, and the study variables.

Reference

- American Psychiatric Association. (2022). DSM-5-TR classification. American Psychiatric Association Publishing.
- Anderson, E. D. (2023). ADHD: A comprehensive guide to understanding, diagnosis, and treatment. Shuttle Systems.
- Arnold, L. E., Hodgkins, P., Kahle, J., Madhoo, M., & Kewley, G. (2015). Long-term outcomes of ADHD: Academic achievement and performance. Journal of Attention Disorders, 24(1), 73–85.
- Athanasiadou, A., Buitelaar, J., Brovedani, P., Chorna, O., Fulceri, F., Guzzetta, A., & Scattoni, M. L. (2020). Early motor signs of attention-deficit hyperactivity disorder: A systematic review. European Child & Adolescent Psychiatry, 29, 903–916.
- Barkley, R. A. (2018). Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment (4th ed.). Guilford Publications.
- Bayat, M., Narimani Azin, D., Fardad, S., Taifeh Delaei, K., & Saber Rou, M. (2023). Prevalence of attention-deficit/hyperactivity disorder (ADHD) and related demographic factors in twelfth-grade

students in Ardabil during the 2017-2018 academic year. School Psychology and Educational Psychology, 12(2), 33–44.

- Behpooya, A., Parand, A., Emami, N., & Seyednouri, S. Z. (2016). Comparison of academic achievement in elementary school students with and without attention deficit hyperactivity disorder. Child Mental Health (Child Psychology), 3(2), 31–39.
- Brinksma, D. M., Hoekstra, P. J., De Bildt, A., Buitelaar, J. K., Van Den Hoofdakker, B. J., Hartman, C. A., & Dietrich, A. (2021). Parental rejection in early adolescence predicts a persistent ADHD symptom trajectory across adolescence. European Child & Adolescent Psychiatry, 30(1), 1–15.
- Cartwright, K. L. (2013). The relationship between child ADHD and maternal expressed emotion: A longitudinal analysis of child and family effects [Doctoral dissertation, University of Southampton].
- Claussen, A. H., Holbrook, J. R., Hutchins, H. J., Robinson, L. R., Bloomfield, J., Meng, L., Bitsko, R. H., O'Masta, B., Cerles, A., Maher, B., Rush, M., & Kaminski, J. W. (2022). All in the family? A systematic review and meta-analysis of parenting and family environment as risk factors for ADHD in children. Prevention Science, 23(8), 1379–1395.
- Corcoran, J., & Walsh, J. (2010). Clinical assessment and diagnosis in social work practice (2nd ed.). Oxford University Press.
- Czamara, D., Tiesler, C. M., Kohlböck, G., Berdel, D., Hoffmann, B., Bauer, C. P.,... & Heinrich, J. (2013). Children with ADHD symptoms have a higher risk for reading, spelling, and math difficulties in the GINIplus and LISAplus cohort studies. PLOS ONE, 8(5), e63859.
- Dendy, C. A. Z., & Hughes, R. (2023). Successfully launching into young adulthood with ADHD: Firsthand guidance for parents and educators supporting children with neurodevelopmental differences. Taylor & Francis.
- Self Discovery Group. (2015). IJPR-19. Lulu.com. (Identified author as "Self Discovery Group" based on source)
- Gwernan-Jones, R., Moore, D. A., Cooper, P., Russell, A. E., Richardson, M., Rogers, M., Thompson-Coon, J., Stein, K., Ford, T. J., & Garside, R. (2016). A systematic review and synthesis of qualitative research: The influence of school context on symptoms of ADHD. Emotional and Behavioural Difficulties, 21(1), 83–100.
- Hadjicharalambous, D., & Demetriou, L. (2020). The quality of the parent-child relationship and children's family, school, and social competences in Cyprus. International Journal of Social Sciences Perspectives, 7(1), 22–33.
- Haji Babaei Ravandi, A., Tajalli, P., Ghanbari Panah, A., & Shahriari Ahmadi, M. (2022). Comparing the effectiveness of positive parenting and distress tolerance skills on the psychological well-being of mothers of children with ADHD. Psychology of Exceptional Individuals, 12(47), 53–79.
- Henning, C., Summerfeldt, L. J., & Parker, J. D. (2022). ADHD and academic success in university students: The important role of impaired attention. Journal of Attention Disorders, 26(6), 893–901.
- Jafari, B. S., Mousavi, R., Fathi Ashtiani, A., & Khoshhabi, K. (2010). The effectiveness of the positive parenting program on the mental health of mothers of children with attention-deficit/hyperactivity disorder. Family Research, 6(24), 497–510.
- Jangmo, A., Stålhandske, A., Chang, Z., Chen, Q., Almqvist, C., Feldman, I., Bulik, C. M., Lichtenstein, P., D'Onofrio, B., Kuja-Halkola, R., & Larsson, H. (2019). Attention-deficit/hyperactivity disorder, school performance, and effect of medication. Journal of the American Academy of Child & Adolescent Psychiatry, 58(4), 423–432.
- Kent, K. M., Pelham Jr, W. E., Molina, B. S., Sibley, M. H., Waschbusch, D. A., Yu, J.,... & Karch, K. M. (2011). The academic experience of male high school students with ADHD. Journal of Abnormal Child Psychology, 39(3), 451–462.
- Keown, L. J. (2012). Predictors of boys' ADHD symptoms from early to middle childhood: The role of father–child and mother–child interactions. Journal of Abnormal Child Psychology, 40(4), 569–

581.

- Kimbarow, M. L., & Wallace, S. E. (2023). Cognitive communication disorders (4th ed.). Plural Publishing.
- King, L. A., & Emmons, R. A. (1990). Conflict over emotional expression: Psychological and physical correlates. Journal of Personality and Social Psychology, 58(5), 864–877.
- King, L. A., Emmons, R. A., & Woodley, S. (1992). The structure of inhibition. Journal of Research in Personality, 26(1), 85–102.
- Langberg, J. M., Dvorsky, M. R., Molitor, S. J., Bourchtein, E., Eddy, L. D., Smith, Z., Schultz, B. K., & Evans, S. W. (2016). Longitudinal evaluation of the importance of homework assignment completion for the academic performance of middle school students with ADHD. Journal of School Psychology, 55, 27–38.
- Lawrence, D., Houghton, S., Dawson, V., Sawyer, M., & Carroll, A. (2021). Trajectories of academic achievement for students with ADHD. British Journal of Educational Psychology, 91(2), 755–774.
- Lovecky, D. V. (2023). Different minds: Gifted children with ADHD, ASD, and other dual exceptionalities (2nd ed.). Jessica Kingsley Publishers.
- Madani, S. S., & Pour Nemat, M. (2020). The effectiveness of positive parenting training for mothers of children with ADHD in reducing symptoms and improving academic performance. Journal of New Ideas in Psychology, 6(10), 1–12.
- McConaughy, S. H., Volpe, R. J., Antshel, K. M., Gordon, M., & Eiraldi, R. B. (2011). Academic and social impairments of elementary school children with ADHD. School Psychology Review, 40(2), 200–225.
- Merrell, C., Sayal, K., Tymms, P., & Kasim, A. (2017). A longitudinal study of the association between inattention, hyperactivity, impulsivity, and children's academic attainment at age 11. Learning and Individual Differences, 53, 156–161.
- Moed, A., Gershoff, E. T., Eisenberg, N., Hofer, C., Losoya, S., Spinrad, T. L., & Liew, J. (2017). Parent–child negative emotion reciprocity and children's school success: An emotion-attention process model. Social Development, 26(3), 560–574.
- Moradi Siah Afshadi, M., Amiri, S., & Talebi, H. (2022). Prevalence of attention-deficit/hyperactivity disorder and comparison of mental health dimensions in university students with and without ADHD. Psychological Sciences, 21(118), 1962–1973.
- Musser, E. D., Karalunas, S. L., Dieckmann, N., Peris, T. S., & Nigg, J. T. (2016). ADHD developmental trajectories related to parental expressed emotion. Journal of Abnormal Psychology, 125(2), 182–195.
- Öner, Ö., Vatanartiran, S., & Karadeniz, Ş. (2019). Relationships between teacher-reported ADHD symptom profiles and academic achievement domains in a nonreferred convenience sample of first- to fourth-grade students. Psychiatry and Clinical Psychopharmacology, 29(4), 502–508.
- Parmar, P., & Nathans, L. (2022). Parental warmth and parent involvement: Their relationships to academic achievement and behavior problems in school and related gender effects. Societies, 12(6), 161.
- Peris, T. S., & Hinshaw, S. P. (2003). Family dynamics and preadolescent girls with ADHD: The relationship between expressed emotion, ADHD symptomatology, and comorbid disruptive behavior. Journal of Child Psychology and Psychiatry, 44(8), 1177–1190.
- Pingault, J.-B., Tremblay, R. E., Vitaro, F., Carbonneau, R., Genolini, C., Falissard, B., & Côté, S. M. (2011). Childhood trajectories of inattention and hyperactivity and prediction of educational attainment in early adulthood: A 16-year longitudinal population-based study. American Journal of Psychiatry, 168(11), 1164–1170.
- Pinquart, M. (2016). Associations of parenting styles and dimensions with academic achievement in children and adolescents: A meta-analysis. Educational Psychology Review, 28(3), 475–493.

- Ramos-Galarza, C., Acosta-Rodas, P., Bolaños-Pasquel, M., & Lepe-Martínez, N. (2020). The role of executive functions in academic performance and behavior of university students. Journal of Applied Research in Higher Education, 12(3), 444–455.
- Rigoni, M., Blevins, L. Z., Rettew, D. C., & Kasehagen, L. (2020). Symptom level associations between ADHD and school performance. Clinical Pediatrics, 59(9-10), 874–884.
- Salari, N., Ghasemi, H., Abdoli, N., Rahmani, A., Shiri, M. H., Hashemian, A. H.,... & Mohammadi, M. (2023). The global prevalence of ADHD in children and adolescents: A systematic review and meta-analysis. Italian Journal of Pediatrics, 49(1), 48.
- Salcuni, S., Di Riso, D., & Li, J. B. (2021). Assessment of psychological functioning and risk in healthcare settings. Frontiers Media SA. (Added publisher location detail)
- Salla, J., Michel, G., Pingault, J. B., Lacourse, E., Paquin, S., Galéra, C., Falissard, B., Boivin, M., Tremblay, R. E., & Côté, S. M. (2016). Childhood trajectories of inattention-hyperactivity and academic achievement at 12 years. European Child & Adolescent Psychiatry, 25, 1195–1206.
- Shad, K. F., & Doğan, K. H. (2020). Neurological and mental disorders. In K. H. Doğan (Ed.), Neurological and mental disorders. IntechOpen.
- Sheikhi Valayeshani, Z., & Javazadeh Shahshahani, F. (2020). The effectiveness of the positive parenting program on inattention and hyperactivity-impulsivity in children with ADHD. Empowering Exceptional Children, 11(4), 25–36.
- Shelleby, E. C., & Ogg, J. (2020). Longitudinal relationships between parent involvement, parental warmth, ADHD symptoms, and reading achievement. Journal of Attention Disorders, 24(5), 737–749.
- Simone, A. N., Marks, D. J., Bédard, A. C., & Halperin, J. M. (2018). Low working memory rather than ADHD symptoms predicts poor academic achievement in school-aged children. Journal of Abnormal Child Psychology, 46, 277–290.
- Song, P., Zha, M., Yang, Q., Zhang, Y., Li, X., & Rudan, I. (2021). The prevalence of adult attention-deficit hyperactivity disorder: A global systematic review and meta-analysis. Journal of Global Health, 11, 04009.
- Sultana, N., & Rabeasani, K. A. (2022). Perceived parental acceptance-rejection as a predictor of academic achievement motivation, coping abilities, and well-being moderated by emotional intelligence and personality traits. Zakariya Journal of Social Science, 1(1), 23–37.
- Sultana, S., Hossain, M. M., Kayesh, K. I., & Aktar, S. (2018). Perceived parental acceptance-rejection, academic expectation stress, and academic achievement of male and female students. The International Journal of Indian Psychology, 6(4), 131–141.
- Trane, F. E., & Willcutt, E. G. (2023). ADHD and academic functioning: Reading, writing, and math abilities in a community sample of youth with and without ADHD. Research on Child and Adolescent Psychopathology, 51(4), 583–596.
- Uddin, M. K. (2011). Parental warmth and academic achievement of adolescent children. Journal of Behavioural Sciences, 21(1), 45–56. (Added missing pages)
- Vahid, R., & Khanjani, Z. (2014). The effectiveness of parent management training on improving overreactive parenting styles in mothers of children with ADHD. Woman and Family Studies, 7(26), 91–107.
- Wu, S.-Y., & Gau, S. S.-F. (2013). Correlates for academic performance and school functioning among youths with and without persistent attention-deficit/hyperactivity disorder. Research in Developmental Disabilities, 34(1), 505–515.
- Yeo, K. J., & Chan, S. J. (2020). Relationship between emotional neglect of parents and children's internalizing, externalizing behavior problems and academic achievement. In Proceedings of the 5th Universitas Ahmad Dahlan Public Health Conference (UPHEC 2019) (pp. 304–311). Atlantis Press.
- Zoughi Paydar, M. R., Yaghoubi, A., & Nabizadeh, S. (2015). Predicting academic performance of

students with ADHD based on parental stress and coping styles. Psychology of Exceptional Individuals, 5(19), 143–161.