

Investigation of the Relationship Between Perceived Expressed Emotion and Levels of Impairment in Functioning Among Adolescents with Attention Deficit Hyperactivity Disorder

Dikkat Eksikliği Hiperaktivite Bozukluğu Tanısı Olan Ergenlerin Algıladıkları Duygu Dışavurumu ile İşlevsellikte Bozulma Düzeyleri Arasındaki İlişkinin İncelemesi

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Abstract

Objective: To assess the perceived expressed emotion (EE) by adolescents with attention deficit hyperactivity disorder (ADHD) from their parents and to investigate the relationship between EE and impairment in functioning, as well as the relationship between internalizing and externalizing symptoms.

Method: The study population comprised 50 adolescents aged 12-17 years who had been diagnosed with ADHD. The adolescents were administered the shortened level of expressed emotion scale in adolescents (SLEES) and youth self-report (YSR) for the young people aged 11-18. The parents completed the Weiss functional impairment rating scale-parent form (WFIRS-P) and the child behavior checklist (CBCL) for children aged 6-18.

Results: It was found that there was a significantly higher difference in the subscale of maternal intrusiveness perceived by adolescents in males. The total score of perceived father's EE were found to be significantly different, which was higher in males ($p<0.05$). No statistically significant relationship was found between the total WFIRS-P score and the mother or father of SLEES. There was no statistically significant relationship between adolescents' perceived EE from their parents and the total internalizing and externalizing scores of the YSR. There was no statistically significant relationship between the adolescents' perceived EE from their parents and the total internalizing and externalizing CBCL scores.

Öz

Amaç: Dikkat eksikliği hiperaktivite bozukluğu (DEHB) olan ergenlerde ebeveynlerinden algıladıkları duygu dışavurumunu (DD) değerlendirmek ve DD ile işlevsellikte bozulma arasındaki ilişkiyi, içe yönelim ve dışa yönelim belirtileri arasındaki ilişkiyi incelemektir.

Yöntem: Çalışmaya DEHB tanısı konmuş 12-17 yaş aralığında 50 ergen dahil edilmiştir. Ergenlere ergenlerde kısaltılmış duygu dışavurum ölçeği (KDDÖ) ve 11-18 yaş gençler için kendini değerlendirme ölçeği (YSR) uygulanmıştır. Ebeveynlere Weiss işlevsellikte bozulma ölçeği-ebeveyn formu (WİBÖ-E) ve 6-18 yaş çocuklar için davranış değerlendirme ölçeği (CBCL) doldurulmuştur.

Bulgular: Erkeklerde müdahalecilik alanında annelerinde algıladıkları duygu dışavurum algısının daha yüksek olduğu saptanmıştır. Erkeklerin babalarında algıladıkları toplam duygu dışavurum algısının daha yüksek olduğu bulunmuştur. WİBÖ-E toplam puanı ile KDDÖ anne ve baba arasında anlamlı bir ilişki bulunmamıştır. Ergenlerin DD algıları ile kendilerini değerlendirdikleri YSR toplam, içe yönelim ve dışa yönelim puanları açısından istatistiksel olarak anlamlı ilişki saptanmamıştır. Ergenlerin algıladıkları DD'ler ile CBCL'nin toplam, içe yönelim ve dışa yönelim puanları arasında istatistiksel olarak anlamlı bir ilişki bulunmamıştır.

Sonuç: DD ile ilgili çalışmaların sonuçları, ebeveyn eleştirisinin ve çocukla düşük düzeyde olumlu ilişkinin DEHB belirtilerindeki değişimi

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Abstract

Conclusion: The results of studies on EE are inconclusive with regard to the question of whether parental criticism and low levels of positive relationships with children can predict changes in ADHD symptoms and whether they are potential predictors of changes in ADHD symptoms. Our findings indicated that despite the perceived high emotional expression of adolescents with ADHD, there was no significant relationship between perceived EE and functioning in daily life. Furthermore, our results demonstrated that the comorbidity of ODD in addition to ADHD did not lead to a significant difference in perceived EE.

Keywords: Adolescent psychiatry, attention deficit hyperactivity disorder, functional impairment, parents, perceived expressed emotion

Öz

yordayıp yordamadığı ve DEHB belirtilerindeki değişimin potansiyel yordayıcıları olup olmadığı sorusu açısından yetersizdir. Bulgularımız, DEHB'li ergenlerde algılanan yüksek duygu dışavuruma rağmen, algılanan DD ile günlük yaşamdaki işlevsellik arasında anlamlı bir ilişki olmadığını göstermiştir. Ayrıca, sonuçlarımız DEHB'ye ek olarak KOKGB komorbiditesinin algılanan DD'de anlamlı bir farklılığa yol açmadığını göstermiştir.

Anahtar kelimeler: Adölesan psikiyatri, algılanan duygu dışavurumu, dikkat eksikliği hiperaktivite bozukluğu, ebeveynler, işlevsellikte bozulma

Introduction

Attention deficit hyperactivity disorder (ADHD) is a chronic neurodevelopmental disorder characterized by age-inappropriate inattention, hyperactivity, and impulsivity, which can adversely affect activities related to the community, school, or work (1). It has been reported that ADHD affects 5-7% of children worldwide (2). It is a well-established fact that oppositional defiant disorder (ODD), which is one of the most common categories of disruptive behavior associated with ADHD, has a high prevalence rate of 33% in adolescents. (3). The available evidence indicates that the co-occurrence of an ODD diagnosis in conjunction with ADHD is associated with an elevated probability of problematic behavior, which in turn is associated with greater symptom severity and an increased risk of social difficulties (4).

It has been proven that parenting methods, psychopathologies, home stress, and parent-child conflicts affect ADHD symptoms, course, and outcomes (5). Expressed emotion was defined as a measure of parents' attitudes toward their children, such as hostilities, overinvolvement, critical comments and overprotectiveness/protectiveness (6). It has been hypothesized that expressed emotion, such as the expression of high levels of negative and low levels of positive emotions toward the child in parental attitudes, indicated family stress, poor quality parental support, and a negative parent-child relationship, which in turn affected the developmental course of the disorder, including an increase in ADHD symptoms and concomitant development of ODD, which may affect the recurrence and course of diseases (7-9).

In addition to revealing the interpersonal relationship, EE allows us to interpret children's daily functioning by measuring the quality of parents' behavior toward their children (10).

Parental EE may have concurrent and longitudinal associations with internalizing and externalizing problems and functioning in children and adolescents in community and clinical samples (11,12).

In addition, to screen for primary symptoms, assessment of EE and functional impairment at home and school is a critical aspect of the diagnosis and treatment of childhood ADHD. These factors play an important role in children's overall development and should be considered comprehensively (13).

This study aimed to investigate the perceived parental EE of adolescents who were diagnosed with ADHD with/without ODD and to examine the relationship between EE and the functional impairment of adolescents based on the statements of their families. Another objective of this study was to evaluate the internalizing and externalizing behaviors observed by adolescents in themselves and by their parents and the relationship between EE and these behaviors.

Materials and Methods

Participants

This study was conducted at the Kocaeli University Faculty of Medicine and received ethics committee approval from the Kocaeli University Faculty of Medicine Clinical Research Ethics Committee (project no: 2016/241). This study was conducted in accordance with the ethical standards of the responsible committee on human experimentation and the Helsinki Declaration. The study was conducted between March and September 2016 with 50 adolescent patients aged 12-17 years who were diagnosed with ADHD and/or ODD according to the semi-structured childhood schedule for affective disorders and schizophrenia-present and lifetime version-Turkish adaptation based on the diagnostic and statistical manual of mental disorders-5 diagnostic

criteria. Informed consent was obtained from the families of all patients who agreed to participate in the study.

Inclusion criteria: a) Diagnosis of ADHD or ADHD+ODD, b) aged 12-17 years, c) scoring above 80 on the Wechsler intelligence scale for children-revised (WISC-R) test, d) to have fully completed the scales in the study, e) living with at least one parent.

The exclusion criteria were as follows: a) Aged <12 years and/or >17 years, b) scored below 80 on the WISC-R test, c) chronic organic disease, d) diagnosed with conditions such as autism, anxiety disorder, schizophrenia, bipolar disorder, and psychotic disorder and general developmental delay, e) receive special education support, f) neurological disease, g) did not complete the scales in the study.

Materials

Socio-demographic information prepared by the researcher. Shortened level of expressed emotion scale in adolescents (SLEES) and the youth self-report for the young people aged 11-18 (YSR/11-18) were administered to the adolescents. Parents were asked to complete the weiss functional impairment rating scale-parent form (WFIRS-P) and the child behavior checklist for children aged 6-18 (CBCL/6-18). The CBCL was administered to evaluate the assessments of parents about behavioral and emotional problems in adolescents, and the YSR was administered to enable adolescents to self-report their emotional and behavioral problems. Accordingly, an objective mutual evaluation was planned.

Socio-demographic Data Form

The socio-demographic data form was developed by the authors to collect information pertaining to the socio-demographic characteristics of adolescents and their families. The form includes a series of questions regarding family information, including age, gender, educational status, parents' age and educational status, as well as the presence of mental and physical illnesses.

CBCL/6-18

CBCL assesses behavioral and emotional problems in children aged 6-18 years based on information provided by parents and was developed by Achenbach and tested for reliability in Turkey in 1985. The CBCL lists behavioral problems in two subtitles: "Internalizing problems" includes the "anxious/depressed, withdrawn/depressed, and somatic complaints" subtests and "externalizing problems" includes the "delinquent behaviors and aggressive behaviors" subtests (14,15).

YSR/11-18

The YSR assesses emotional and behavioral problems of children aged 11 -18 years based on information they provide and was developed by Achenbach. The YSR classifies behavioral problems as follows: "Internalizing" and "externalizing". The internalizing group includes "anxious/depressed, withdrawn/depressed, and somatic complaints" and the externalizing group "delinquent behaviors and aggressive behaviors" subtests (16,17).

WFIRS-P

It is a 50-item Likert-type scale developed by Dr. Margaret Weiss to assess functional impairment associated with ADHD (18). Tarakçioğlu et al. (19) conducted a validity and reliability study of the scale in Turkey. This includes the subheadings of family, school, life skills, child self-concept, social activities, and risky activities.

SLEES

SLEES was developed by Nelis et al. (20) and was adapted to Turkish by Vural et al. (21). The scale consists of 33 items that measure the EE of the most influential person in the participant's life in the last three months and involves the subscales of lack of emotional support (LES), irritability, and intrusiveness. High scores indicate a high degree of EE. The scale is read and filled out by the adolescent. A request was made by adolescents to provide a description of the emotional expressions they perceived from their parents, which they were to do by thinking about their parents (21).

Statistical Analysis

The data were analyzed using SPSS for Windows, 20.0 (IBM Corp, Armonk, NY, USA). The variables (numerical data) were tested for normality using the Kolmogorov-Smirnov test. Numerical variables with normal distribution are presented as mean +/- standard deviation. For normally distributed numerical variables, the difference between the groups was determined using the independent sample t-test. Differences between groups for numerical variables with non-normal distribution were determined using the Mann-Whitney U test and Kruskal-Wallis test. The relationships between numerical variables were evaluated using the Spearman Correlation Analysis. Statistical significance was set as $p < 0.05$.

Results

In the study, 13 (26%) of the 50 patients were female, and 37 (74%) were male. The average age of the patient group was 13.7 ± 1.69 years, ranging between 12 and 17 years. Of the patients in the study, 34 (68%) were primary school

students and 16 (32%) were high school students.

The mean ages of the mothers of the adolescents was found to be 40.92±5.09, and 44.44±6.09 for the fathers. A total of 22 (44%) of the mothers of the adolescents had completed primary school, 9 (18%) had completed secondary school, 13 (26%) had completed high school, and 6 (12%) had completed university. Additionally, it was determined that 15 (30%) of the fathers of the adolescents had completed primary school, 9 (18%) had completed secondary school, 14 (28%) had completed high school, and 12 (24%) had completed university. The mothers of 17 patients (34%) and the fathers of 44 patients (88%) were engaged in either full-time or part-time employment. Among the families participating in the study, 22 (44%) had a physical disease. Moreover, 29 (58%) were found to have a mental disorder. A total of four patients presented for the first time, and 46 were under treatment. The diagnosis, ADHD subtypes, and treatment status of the adolescents are presented in Table 1.

The scores for the total and subscales of the SLEES are presented in Table 2. Given the possibility that perceived EE may vary according to sex, an analysis was conducted to determine whether such differences exist. The difference between the total and subscale scores of the perceived EE by adolescents according to sex is presented in Table 3. The subscale of maternal intrusiveness perceived by

adolescents and the total score of perceived father's EE were found to be significantly different, which was higher in males (p 0.05).

The relationships between WFIRS-P and SLEES are presented in Table 4. No statistically significant relationship was identified between the WFIRS-P total score and SLEES mother and father (p>0.05). No statistically significant relationship was identified between the perceived EEs of adolescents and the total, internalizing, and externalizing scores of the YSR. Similarly, no statistically significant relationship was observed between the perceived EEs of adolescents and the total, internalizing, and externalizing scores of the CBCL. The relationships between the perceived EEs of adolescents and their CBCL and YSR scores are presented in Table 5.

Furthermore, an analysis was conducted to compare ADHD and ADHD+ODD comorbidity, ADHD subtypes, and gender with functioning, with the objective of determining whether such differences exist. No statistically significant difference was found between ADHD and ADHD+ODD and perceived EE. Similarly, no statistically significant difference was found between the subtypes of ADHD and perceived EE (p>0.05). The comparison of the total WFIR-S score according to sex, diagnosis, and ADHD subtype is presented in Table 6.

Table 1. Diagnosis, ADHD subtypes, and treatment status of the adolescents

Features	Groups	Number (n)	Percentage (%)
Diagnosis	ADHD	24	48
	ADHD+ODD	26	52
ADHD subtypes	ADHD-AD	20	40
	ADHD-HI	2	4
	ADHD-C	28	56
Treatment	No	4	8
	Yes	46	92

AD: Attention deficiency, ADHD: Attention deficit hyperactivity disorder, C: Combined, HI: Hyperactive/impulsive, ODD: Oppositional deficiency disorder

Table 2. SLEES total and subscale scores

SLEES scores	Mean ± SD
Maternal LES	48.24±7.91
Maternal irritability	20.84±7.57
Maternal intrusiveness	13.82±3.87
Maternal total score	82.90±9.28
Paternal LES	44.74±12.83
Paternal irritability	20.24±7.20
Paternal intrusiveness	12.46±3.85
Paternal total score	77.44±15.71

SD: Standard deviation, SLEES: Shortened level of expressed emotion scale, LES: Lacking emotional support

Table 3. Comparison of the SLEES total and subscale scores by sex

SLEES scores	Sex	Mean ± SD	Median	p
Maternal LES	Female	49.08±8.56	52	0.499
	Male	47.95±7.77	50	
Maternal irritability	Female	17.77±4.26	17	0.165
	Male	21.92±8.21	18	
Maternal intrusiveness	Female	11.69±2.42	12	0.016*
	Male	14.57±4.03	15	
Maternal total score	Female	78.54±8.26	80	0.132
	Male	84.43±9.23	84	
Paternal LES	Female	38.38±17.27	46	0.111
	Male	46.97±10.24	49	
Paternal irritability	Female	16.85±6.23	18	0.140
	Male	21.43±7.22	20	
Paternal intrusiveness	Female	10.69±4.44	12	0.119
	Male	13.08±3.47	13	
Paternal total score	Female	65.92±24.36	69	0.011*
	Male	81.49±8.57	79	

SD: Standard deviation, SLEES: Shortened level of expressed emotion scale, *: Mann-Whitney U test

Table 4. Relationship between WFIRS-P and SLEES

Spearman's rho	SLEES	WFIRS-P total	
	Maternal total SLEES score	Correlation coefficient	-0.070
		Sig. (2-tailed)	0.629
	Paternal total SLEES score	Correlation coefficient	0.091
		Sig. (2-tailed)	0.530

SLEES: Shortened level of expressed emotion scale, WFIRS-P: Weiss functional impairment rating scale-parent report

Table 5. Relationship between SLEES, CBCL, and YSR scores

			YSR_I	YSR_E	YSR_T	CBLC_I	CBLC_E	CBLC_T
Spearman's rho	Maternal total SLEES score	Correlation coefficient	-0.017	-0.153	-0.016	-0.102	-0.111	-0.104
		Sig. (2-tailed)	0.909	0.289	0.914	0.481	0.443	0.471
	Paternal total SLEES score	Correlation coefficient	0.055	-0.108	-0.033	0.031	0.108	0.107
		Sig. (2-tailed)	0.706	0.454	0.822	0.833	0.457	0.458

CBLC_E: Child behavior checklist _ Externalizing, CBLC_I: Child behavior checklist _ Internalizing, CBLC_T: Child behavior checklist _ Total, YSR_E: Youth self-report _ externalizing, YSR_I: Youth self-report _ Internalizing; YSR_T: Youth self-report total

Table 6. Comparison of total WFIRS-P scores according to sex, diagnosis, and ADHD subtypes

Features		Weiss total score		
		Mean ± SD	Median	p
Sex	Female	21.62±14.85	17	0.682*
	Male	24.49±18.24	20	
Diagnosis	ADHD	20.04±13.45	17.50	0.180*
	ADHD+ODD	27.15±23.50	19.91	
ADHD subtypes	AD	21.50±16.08	18	0.640**
	HI	28.50±17.67	28.50	
	C	25±18.54	24	

*: Mann-Whitney U test, **: Kruskal-Wallis test, AD: Attention deficiency, ADHD: Attention deficit-Hyperactivity disorder, C: Combined, HI: Hyperactive/impulsive, ODD: Oppositional defiant disorder, SD: Standard deviation, WFIRS-P: Weiss Functional impairment rating scale-parent report

Discussion

This study examined the relationship between the perceived parental EEs of adolescents diagnosed with ADHD with/without ODD and the levels of impairment in functioning assessed by their families. A review of the literature revealed no studies that have evaluated the perceived parental EEs and impairment in functioning in patients with ADHD. Furthermore, studies in the literature on perceived EEs in adolescents with ADHD have been examined in terms of maternal EEs; however, this study analyzed the perceived EEs of both parents.

There is mounting evidence to suggest that there is a significant correlation between parenting skills and children's academic, social, and neuropsychological development (5,22). It has been reported that perceptions of children about their parents regarding their expressed behaviors due to ADHD may positively or adversely affect the quality of the parent-child relationship. Consequently, the comments made by parents may either enhance or diminish the influence of ADHD symptoms on the parent-child relationships (23).

No significant correlation was found between functional impairment and perceived parental EE in adolescents with ADHD. This result contradicts expectations. The fact that the treatment group constituted the majority of patients in our study and that the total WFIRS-P score was low in comparison with the literature suggests that EE may have been positively affected (24). The majority of patients attended regular follow-up visits, which may have facilitated the implementation of behavioral approaches to ADHD. However, to more accurately assess the relationship between the functioning of adolescents with ADHD and perceived parental EE, it may be beneficial to work with samples who have not received any medical or behavioral treatment and to include familial, environmental, and biological factors that may influence it. Impulsive reactivity, poor social skills, poor problem-solving ability, and social isolation, which are among the difficulties in the social functioning of adolescents with ADHD, may also cause family conflicts (25). The perception of high parental EE as a consequence of family conflict may have a detrimental impact on adolescents, thereby reinforcing the clinical symptoms of ADHD. Conversely, effective ADHD treatment may lead to a reduction in family conflict, which in turn may result in a decrease in parental EE.

The total score of perceived mother EE was 82.90 ± 9.28 , while the total score of perceived father EE was 77.44 ± 15.71 . In a

further study by Ucar et al. (26), the total score for perceived EE was 63.2 ± 15.3 , with the following scores for the EE subscale: subscale of LES 28.8 ± 9.7 , subscale of irritability 19.9 ± 6.7 , and intrusiveness 14.4 ± 3.2 . A comparison of the present findings with those of previous studies indicates that perceived EE is higher in this context. The previous study was conducted according to the EE of individuals perceived as most important in the participant's life over the previous three months. Therefore, the present study may differ from the previous one due to the measurement of EE perceived by adolescents from their parents (26). A number of studies have indicated that mothers of children with ADHD are unable to fulfill their parental roles, communicate less with their children, and lack intimacy (27,28). Another study concluded that the majority of therapeutic interventions for EE currently in use are based on the assumption that maternal EE increases the likelihood of developing symptoms in adolescents (29). A review of the literature revealed no studies examining the correlation between perceived father EE by adolescents with ADHD. Given that mothers are typically housewives, they may have spent more time with their adolescents and may have experienced EE, protectiveness/overprotectiveness, and irritability more intensely. The finding that fathers were more likely to be employed outside the home suggests that they may have interacted less with their adolescents than mothers (30).

A comparison of total and subscale EE scores according to sex revealed a significant difference in the perception of maternal intrusiveness in males. The mother's perceived EE was higher in males. A review of the literature revealed no significant difference between female and male in the perceived parental EEs in children with ADHD (26). A study with a similar design to our own reached the same conclusion, namely, that mothers exhibit a more critical EE than fathers (31). The relationship between the maternal EEs toward males and the psychopathological symptoms of mothers and children was evaluated in a study by Psychogiou et al. (32), who found a positive relationship between criticism and ADHD symptoms and emotional and behavioral symptoms. The fact that males may have more age-specific expressive behaviors than females suggests that their perceived intrusiveness from their mothers, who are authority figures, may have increased.

The total perceived fathers EE scores were significantly higher among the male. It was reported that depressive symptoms of fathers had a more severe impact on males (33). Fathers of children with ADHD were determined to

be more demanding and assertive about power and were less likely to express warm feelings toward their children. It is possible that fathers react to the opposition of their sons by asking them to obey them rather than responding warmly (28,34). Fathers diagnosed with ADHD may have experienced discomfort or a sense of being overwhelmed by ADHD symptoms, which may have led to an increase in adverse parenting behaviors (32). Consequently, fathers may have focused excessively on and become overly interested in ADHD symptoms when their children with ADHD reached puberty. Consistent with previous research on the father-child relationship, our study found that adolescents with ADHD had less active interaction with their fathers, perceived less family support, and experienced more severe behavioral problems (34,35).

No significant differences were identified between ADHD and ADHD+ODD patients in terms of perceived parental EE. The results of our study are in line with those of a previous investigation conducted in Turkey (26). Sonuga-Barke et al. (36) reported that negative maternal EE concerning family and parent dynamics could potentially contribute to problematic behaviors and ODD in children with ADHD. The results of this study demonstrated that the EE was influenced by behavioral issues, maternal depression, and the range of additional mental health symptoms observed in children, rather than the symptoms of ADHD itself. In the six-year follow-up study conducted by Richards et al. (37), the cross-sectional and longitudinal relationships between behavioral problems in children with ADHD and parental EEs were examined. EE (maternal warmth and criticism) and the severity of ADHD symptoms were found to have a negative cross-sectional relationship with children's defiant, ODD, and conduct problems. However, a longitudinal analysis revealed no statistically significant correlation between the emotional state of the mother and subsequent manifestations of ODD/behavior disorder (DB) symptoms. In the study conducted by Richards et al. (38), a positive correlation was observed between maternal warmth, caregiving, and positive social behavior, while a negative correlation was noted between these same variables and antisocial behavior. Conversely, maternal criticism was found to be positively associated with antisocial behaviors. In our study, the exclusion of comorbid diseases, children with conduct problems were not included in the study, and the intensity of patients receiving treatment may have created a more naive patient sample group, which may have resulted in no discernible difference between the ADHD and ADHD+ODD groups.

It has been reported that impairment in family functioning is a significant factor in the development of ODD in children diagnosed with ADHD (39). The existing literature indicates that impairment in family functioning is more pronounced in children diagnosed with ADHD in the presence of comorbidities such as ODD (40). The findings of our study, however, revealed no significant difference in emotional expression, which is an important factor in family functioning, among families of adolescents with ADHD diagnosed with additional ODD. This finding is inconsistent with the literature.

The present study revealed no statistically significant difference in the perceived EE according to ADHD subtype. Ucar et al. (26) found that the perceived LES scores in the combined type of ADHD were higher than those in the attention deficit dominant type of ADHD. Çöp et al. (41) reported that children with ADHD, especially those with hyperactivity symptoms, considered their parents to be more indifferent, less affectionate, and more rejecting, and perceived them as less controlling. It should be noted that this study included adolescents who were under treatment and comprised a small sample group, which may have affected the results.

No significant relationship was found between the total, internalizing, and externalizing YSR scores and the perceived parental EE reported by the adolescents. Despite the limited data in the literature, high levels of perceived maternal EE are associated with high levels of internalizing and externalizing symptoms in adolescents (11,12). Another study reported no significant bidirectional relationship between parents' critical/positive comments and children's emotional problems (5). This is attributed to the fact that parents' responses to their children's emotional disorders may be less intense than those for behavioral disorders. According to the EE impact model theory, high EE family environments were believed to increase psychopathological distress in adolescents. However, our study results are inconsistent with these data, as no significant relationship was found between EE and adolescents' internalizing and externalizing evaluations. Furthermore, Hale et al.'s (42) six-year longitudinal study identified a psychopathological impact model that contradicted the common view that high EE family environments contribute to increased adolescent psychopathological distress. In our study, the positive outcomes of treatment in terms of functional internalization, externalization, and general symptoms positively influenced perceived EE, supporting Hale et al.'s (42) that expressive behaviors of adolescents may affect EE.

No significant relationship was found between the total, internalizing, and externalizing CBCL scores and the perceived parental EE reported by the adolescents. Despite the limited existing literature on the topic, evidence has suggested that high levels of maternal emotional expression are associated with elevated levels of both internalizing and externalizing symptoms in adolescents, as demonstrated by previous studies (11,12). The study conducted by Hale et al. (42) using the EE Scale administered to mothers determined that the mothers' actions guided their EE, rather than the mothers' perceived EE affecting their behavior (43). In contrast, our study observed no relationship between the behavioral problems assessed by mothers and the adolescents' perceptions of parental EE. These findings suggest that improvements in children's functionality related to reduced behavioral difficulties may influence.

This cross-sectional study focused on adolescents with ADHD. However, to gain a more comprehensive understanding of the subject matter, it would be beneficial to conduct follow-up studies that encompass not only the adolescent period but also the early childhood, preschool, and school stages. It has been proposed that the inconsistency of the disparate study results on EE may be attributed to the inability to predict changes in EE over time, which is an image of a momentary situation susceptible to contextual and developmental factors. The argument has been made that perceived EE may be advantageous for understanding parental perceptions of their children in terms of their sensitivity to the developmental stages of children and early intervention in the EE (22,35).

Study Limitations

This study has some limitations. First, the small sample size precludes definitive conclusions. Second, there was a paucity of information on the mental health disorders of the parents. Third, the cross-sectional design makes it challenging to infer causality, and longitudinal studies are needed to address this.

The strengths of the study are the assessment of fathers' EE, which distinguishes from other studies. In addition, the YSR was completed by adolescents to assess psychiatric symptoms, and the CBCL was completed by parents to assess symptoms more reliably. It is recommended that a follow-up study with a larger sample size, including a control group, be conducted in the future to measure the confounding effect of intrafamilial EE on prognosis.

Conclusion

The results of studies on EE are inconclusive with regard to the question of whether parental criticism and low levels of positive relationships with children can predict changes in ADHD symptoms and whether they are potential predictors of changes in ADHD symptoms. Our findings indicated that despite the perceived high emotional expression of adolescents with ADHD, there was no significant relationship between perceived EE and functioning in daily life. Furthermore, our results demonstrated that the comorbidity of ODD in addition to ADHD did not lead to a significant difference in perceived EE. Furthermore, no significant difference was observed between emotional and behavioral internalizing and externalizing symptoms and EE. In our study, we concluded that ADHD, a neurodevelopmental disorder, did not significantly affect perceived expressed emotion, functioning in daily life, and emotional and behavioral internalizing and externalizing symptoms. This may indicate that children's perceived expressed emotion from their families, such as family stress or high protective attitudes, does not affect important areas in children's lives.

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Ethics

Ethics Committee Approval: Our study was approved by the Ethics Committee of Kocaeli University Faculty of Medicine with decision number 2016/241 and was conducted in accordance with the Declaration of Helsinki.

Informed Consent: We enrolled the patients after informing them about the study and obtaining their written consent.

Authorship Contributions

Concept: Z.V.P., A.C., Design: Z.V.P., A.C., Data Collection or Processing: Z.V.P., Analysis or Interpretation: Z.V.P., A.C., İ.D.Ç., Drafting Manuscript: Z.V.P., A.C., İ.D.Ç., Critical Revision of Manuscript: Z.V.P., A.C., İ.D.Ç., Final Approval and Accountability: Z.V.P., A.C., İ.D.Ç., Technical or Material Support: Z.V.P., Supervision: Z.V.P., A.C., İ.D.Ç., Writing: Z.V.P., A.C., İ.D.Ç.

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