

Pain Severity and Psychosocial Quality of Life in Adolescents with Migraine and Tension-Type Headache: Mediation by Perceived Expressed Emotion and Self-Esteem

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Submitted May 22, 2020;
accepted August 15, 2020

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Aims: To investigate perceived expressed emotion (EE) and self-esteem in adolescents with primary headaches and to assess the psychologic factors, especially perceived EE, that may play a mediating role in the relationship between pain severity and psychosocial quality of life (QoL). **Methods:** The sample of this single-center cross-sectional case-control study consisted of 102 adolescents with migraine without aura, 36 adolescents with tension-type headache (TTH), 62 age- and sex-matched healthy adolescents, and their parents. Perceived EE was evaluated with the Shortened Level of Expressed Emotion Scale (SLEES). The Rosenberg Self-Esteem Scale (RSS) was used to assess the self-esteem of the participants. **Results:** There were significant differences in both SLEES ($F [2.199] = 7.913, P < .001$) and RSS ($F [2.199] = 8.138, P < .001$) scores between the groups. When the two groups were compared in terms of SLEES score, adolescents with migraine and TTH had significantly higher levels of perceived EE and lower levels of self-esteem than their healthy peers. In mediation analyses, RSS and SLEES scores were found to be partial mediating factors in the relationship between pain severity and psychosocial QoL. **Conclusion:** Adolescents with migraine and TTH had higher perceived EE and lower self-esteem than their healthy peers. The most important result of this study was the demonstration that self-esteem and perceived EE can be two factors that play a mediating role in the relationship between headache and psychosocial QoL. *J Oral Facial Pain Headache 2021;35:62–71. doi: 10.11607/ofph.2768*

Keywords: adolescents, migraine, perceived expressed emotion, self-esteem, tension-type headache

Primary headaches and related symptoms can cause physical and emotional difficulties, social and family life problems, school absenteeism, and learning difficulties.¹ Primary headaches significantly reduce the quality of life (QoL) of children and adolescents, depending on the degree of the disorder and the type of headache. Apart from the factors related to headache, it is known that various psychologic difficulties affecting QoL accompany primary headaches.² In this sense, in addition to psychologic difficulties such as anger, depression, and anxiety, poor self-esteem has been reported to be associated with primary headaches in children with primary headache.^{3,4} In the literature, poor self-esteem has been shown to be associated with headaches and recurrent abdominal pain.^{5,6}

In recent years there has been an increase in the number of studies about the relationship between headaches and QoL in children.^{7,8} A review study showed that children with frequent or severe headaches tend to experience problems in family life and other relationships and experience various difficulties in their educational processes and daily activities than children without frequent or severe headaches.⁹ Parent-child interactions and family environment have significant impact on children's pain perception, QoL, and chronic diseases.¹⁰ Expressed emotion (EE), an empirical concept indicating the emotional climate at home,¹¹ is a measure of environmental stress. EE is a construct described as a series of behaviors, feelings, and thoughts of the family toward the patient.¹² EE is not solely an indicator of psychosocial

problems, but may also be related to the presence of physical diseases.¹³ Perceived EE refers to how the attitudes of family members are perceived by adolescents. Studies in the literature have revealed the relationships among perceived EE, obesity, iron deficiency anemia, diabetes mellitus, and chronic pain.^{14–17} Because of these relationships, primary headaches are also likely to affect perceived EE in adolescents. In this context, considering the relationship of perceived EE with parameters of other physical diseases, it can be predicted that EE has a significant relationship with headache severity and QoL.

In the literature, the relationship between psychological symptoms and QoL in individuals with headache has been revealed. While it is known that QoL is affected negatively as the severity of pain increases, which psychological factors may play a role in the relationship between pain and psychosocial QoL has not yet been investigated. Likewise, the concept of EE, which has been investigated in many physical diseases, has not yet been evaluated in primary headaches in adolescents. Considering these deficiencies in the literature, this study aimed to assess the differences in perceived EE and self-esteem of adolescents with migraine and tension-type headache (TTH) compared to those of their healthy peers. The second aim of this study was to investigate the psychological factors, especially perceived EE, that may play a mediating role in the relationship between pain severity and psychosocial QoL. This is the first study to determine the mediation effect of psychological factors between pain severity and patient QoL.

The hypotheses were:

1. Adolescents with primary headache will show higher perceived EE and lower self-esteem scores.
2. Adolescents' headache severity and psychosocial QoL will vary according to perceived EE, self-esteem, and other psychological symptom scores.
3. The relationship between headache severity and patients' psychosocial QoL will be mediated with perceived EE, self-esteem, and other psychological symptom scores.

Materials and Methods

Setting and Participants

A power analysis was conducted using G*Power version 3.1¹⁸ in order to detect a moderate effect size (0.35) when $\alpha = .05$ for a power of 0.80 using analysis of variance (ANOVA) with fixed effects. Based on these criteria, G*Power estimated a minimum sample size of 84, with 28 in each group. The sample

of this study, which was designed as a single-center cross-sectional case-control study, includes 200 adolescents aged 12 to 17 years. The primary headache group was composed of adolescents between the ages of 12 and 17 who presented at the Giresun University Medical School Pediatric Neurology Outpatient Clinic between October 15, 2019, and February 15, 2020. The International Classification of Headache Disorders-3 (ICHD-3) beta criteria were used to diagnose primary headache in the study sample.¹⁹ Accordingly, 102 adolescents with migraine without aura and 36 adolescents with TTH comprised the primary headache group, while 62 healthy adolescents were included in the study as a control group. As in another study conducted in children in Turkey, the diagnosis of TTH was less common than the diagnosis of migraine in the outpatient clinic during the time interval of the study.²⁰ However, the number of participants in the TTH group seems to be sufficient according to the power analysis.

A total of 182 patients who attended this outpatient clinic and were diagnosed with primary headache were evaluated in terms of participation in the study. A total of 44 patients were excluded: 8 refused to participate, and 36 did not meet the inclusion criteria. The remaining 138 adolescents were included in the primary headache group (Fig 1). The sample size was based on the authors' previous experience with this design. The parents of the participants were also included in the study and were informed about the methods and goals. Written informed consent was obtained from the parents. Ethical permission and approval for this study were obtained from the Giresun University Medical Faculty Ethics Committee (Date: March 10, 2019, No: 03.10.2019/5).

The criteria for inclusion in the primary headache group were: (1) having a diagnosis of migraine or TTH without aura; (2) being between the ages of 12 and 17 years; and (3) living with at least one parent. Adolescents with a diagnosis or history of other physical, psychiatric, or neurologic disorders and adolescents with mental retardation were excluded. In addition, patients with parents with inadequate literacy were also excluded.

A total of 94 adolescents who were admitted to the hospital for routine check-ups were evaluated for the control group of the study. A total of 32 were excluded: 8 refused to participate, and 24 did not meet the inclusion criteria. Sixty-two adolescents who were not diagnosed with any psychiatric or physical disorders were included in the healthy control group (Fig 1). The criteria for inclusion in the healthy control group were: (1) no history of psychopathology, intellectual development disorders, or neurologic/chronic physical disorders; (2) being between the ages of 12 and 17 years; and (3) living with at least one parent.

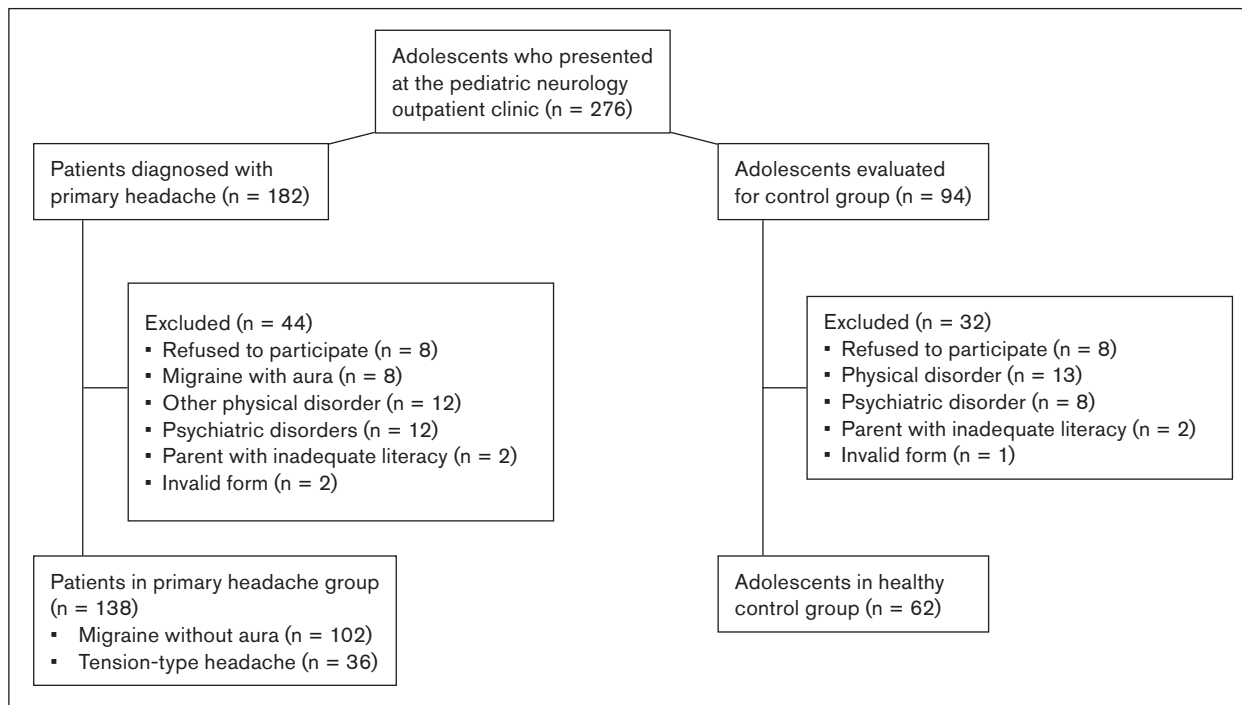


Fig 1 Flowchart of participant selection.

Adolescents with a diagnosis or history of physical, psychiatric, or neurologic disorders and adolescents with mental retardation were excluded. In addition, patients with parents with inadequate literacy were also excluded.

Sociodemographic data of the participants were evaluated by a questionnaire prepared by the researchers. Psychologic symptoms were screened with the Strengths and Difficulties Questionnaire (SDQ).²¹ Perceived EE was evaluated with the Shortened Level of Expressed Emotion Scale (SLEES).²² Self-esteem of the participants was assessed with the Rosenberg Self-Esteem Scale (RSS).²³ QoL was assessed with the Pediatric Quality of Life Inventory (PedsQoL).²⁴ Pain severity was assessed with a visual analog scale (VAS).²⁵ The scales were completed by adolescents and their parents under supervision of the researchers.

Measures

In the sociodemographic data questionnaire, participants were asked about age, gender, income level, family structure, parental education level, and parental employment status. Income level was assessed according to official hunger and poverty limits in 2019.

The Strengths and Difficulties Questionnaire (SDQ) was developed to screen psychologic symptoms²¹ and was translated into Turkish in 2008.²⁶

The Cronbach's alpha score of the Turkish version is 0.73. The SDQ consists of 25 items and 5 subscales (hyperactivity, conduct problems, peer problems, emotional symptoms, and prosocial behaviors). High subscale scores indicate the possibility of psychopathology. As an exception, low scores on the prosocial behaviors subscale indicate the risk of psychopathology. In this study, the SDQ was filled in by the parent who came with the participant.

The SLEES, originally developed by Nelis et al,²² was adapted for Turkish by Vural et al in 2013²⁷ and is composed of 33 items that measure the EE of the person perceived to be most important in the life of the participant during the preceding 3 months. The SLEES consists of three subscales: lack of emotional support (LES), irritability, and intrusiveness. Elevated levels of EE are indicated by high scores. In a study by Nelis et al,²² the Cronbach's α coefficients for the LES, irritability, and intrusiveness subscales were 0.88, 0.82, and 0.70, respectively. Vural et al²⁷ evaluated the reliability of the scale and found a maximum Cronbach's α coefficient of 0.90. The SLEES scale is completed directly by the adolescent, and responses are reported according to a 4-point Likert-type scale ranging from 1 (not true) to 4 (true).

The RSS was developed by Rosenberg in 1965 to assess self-esteem in children and adolescents.²³ The entire scale consists of 12 subtests. Only the

first subtest was used to evaluate self-esteem in the present study. This subtest consists of 10 questions in a 4-point Likert-type structure. The score can range from 10 to 40, with 40 points representing the highest score possible. Higher scores refer to higher levels of self-esteem. The validity and reliability of the scale in Turkish were assessed by Çuhadaroğlu in 1986.²⁸ It was observed that the validity coefficient and reliability coefficient of the Turkish version of the scale were 0.71 and 0.75, respectively.

The PedsQoL is a scale that evaluates health-related QoL in children aged 2 to 18 and was developed by Varni et al.²⁴ Turkish translation, reliability, and validity studies have been performed.²⁹ This 23-item scale provides information in three areas in the field of health-related QoL: psychosocial QoL, physical QoL, and total QoL. The scale can be filled in by self-report or parent report. The response scale is a 5-point Likert-type scale. A higher score on the PedsQoL indicates better QoL. The self-report form of the scale was applied to the participants of the research.

The visual analog scale (VAS) was developed for pain severity by Price et al.²⁵ Pain is measured by marking a point on the 10-cm line (0 = no pain, 10 = worst pain).

Statistical Analyses

Statistical analyses were performed using IBM SPSS version 22. The statistical data for the groups were expressed using mean and SD, together with minimum and maximum values. The total scores and subscale scores obtained from the Likert scales used in this study are continuous data and have a normal distribution. For continuous variables exhibiting normal distribution, one-way analysis of variance (ANOVA) was used for comparison among groups. Tukey honest significant difference (HSD) test was used for post hoc comparisons. Significance was evaluated after Bonferroni correction in post hoc tests ($P = .05 / 3 = 0.017$). Comparisons between groups of the categorical variables were performed using chi-square tests. Correlations between pain severity and the PedsQoL, SLEES, RSS, and SDQ scores were analyzed using Pearson correlation coefficient for parametric variables. A value of $P < .05$ was considered statistically significant.

The bootstrap method of Preacher and Hayes was used to determine the significance of the mediation effect.³⁰ The SPSS PROCESS macro was used to calculate the bootstrap method. Five-thousand preloads were made in the calculation of the intermediary effect. Confidence intervals without 0 indicate that the mediating effect is significant.³⁰

Results

The migraine group, the TTH group, and the control group were similar in terms of age ($F = 1.552$, $P = .214$). Seventy-five percent ($n = 76$) of the migraine group, 88.9% ($n = 32$) of the TTH group, and 72.6% ($n = 62$) of the control group were female adolescents. The gender distribution among the three groups was homogenous ($P = .147$). There were no statistically significant differences among the three groups in terms of parental cohabitation, maternal educational level, paternal educational level, or parental employment status. The sociodemographic characteristics of the three groups are presented in Table 1.

Hypothesis 1 predicted that adolescents diagnosed with migraine and TTH would report higher perceived EE scores and lower self-esteem scores compared to healthy controls. In order to test this hypothesis, one-way ANOVA was performed to evaluate differences among the groups in the SLEES and the RSS scores. The SLEES and RSS scores of the migraine, TTH, and control groups are presented in Table 2. The one-way ANOVA test supported hypothesis 1.

Hypothesis 2 predicted that adolescents' headache severity and psychosocial QoL would vary according to perceived EE, self-esteem, and other psychologic symptom scores. To test this relationship, Pearson correlation analyses were conducted. In the total headache group, a mild positive correlation was observed between VAS scores and LES, irritability, and total SLEES scores. A mild negative correlation was found for these variables, as well between VAS scores and RSE scores. When the relationship between the psychosocial QoL and other psychosocial factors in the total headache group was examined, all factors except prosocial behavior were found to be moderately positively correlated. These correlations are shown in Table 3.

Hypothesis 3 predicted that perceived EE, self-esteem, and other psychologic symptom scores would mediate the relationship between pain severity and psychosocial QoL. In order to test this hypothesis, the SPSS PROCESS mediation test was performed to evaluate mediation factors between headache severity and psychosocial QoL. Psychologic factors that were correlated with both VAS scores and psychosocial QoL scores were predicted as factors that might mediate pain severity and psychosocial QoL and were included in the mediation effect analysis (RSS, total SLEES, LES, and irritability subscale of SLEES). The analyses showed that the total effect of VAS levels on psychosocial QoL levels was significant ($\beta = -2.49$, $t = -2.90$, $P = .004$). The bias-corrected 95% CI did not contain 0,³⁰ which revealed

Table 1 Sociodemographic and Pain Variables of the Participants

	Migraine (n = 102)	Tension-type headache (n = 36)	Healthy control (n = 62)	P ^a
	n (%)	n (%)	n (%)	
Sex				
Male	26 (25.5)	4 (11.1)	17 (27.4)	.147
Female	76 (74.5)	32 (88.9)	45 (72.6)	
Age (y), mean ± SD				
	14.67 ± 2.53	15.41 ± 1.97	15.03 ± 1.86	.214 ^b
Family income, TL				
< 2,000	57 (55.9)	18 (50.0)	27 (43.5)	.613
2,000–5,000	35 (34.3)	15 (41.7)	27 (43.5)	
> 5,000	10 (9.8)	3 (8.3)	8 (12.9)	
Parental cohabitation				
Married	98 (96.1)	34 (94.4)	62 (100.0)	.221
Divorced	2 (3.9)	2 (5.6)	0 (0.0)	
Maternal educational level				
Never attended school	31 (30.4)	7 (19.4)	16 (25.8)	.337
Primary school	39 (38.2)	17 (47.2)	21 (33.9)	
Middle school	18 (17.6)	6 (16.7)	8 (12.9)	
High school/university	14 (13.7)	6 (16.7)	17 (27.4)	
Maternal employment status				
Unemployed	93 (91.2)	33 (91.7)	62 (100.0)	.220
Employed	9 (8.8)	3 (8.3)	0 (0.0)	
Paternal educational level				
Never attended school/primary school	45 (44.1)	15 (41.7)	22 (35.5)	.147
Middle school	26 (25.5)	7 (19.4)	9 (14.5)	
High school	21 (20.6)	7 (19.4)	5 (24.2)	
University	10 (9.8)	7 (19.4)	16 (25.8)	
Paternal employment status				
Unemployed	31 (30.4)	10 (27.8)	14 (22.6)	.554
Employed	71 (69.6)	26 (72.2)	48 (77.4)	
Pain severity				
Mild	6 (5.9)	6 (16.7)	-	.072
Moderate	81 (79.4)	28 (77.8)	-	
Severe	15 (14.7)	2 (5.6)	-	
Pain duration				
< 2 h	19 (18.6)	9 (25.0)	-	.058
2–6 h	69 (67.6)	16 (44.4)	-	
6–24 h	10 (9.8)	6 (16.7)	-	
24–72 h	4 (3.9)	5 (13.9)	-	
Pain frequency				
1–3 times/mo	18 (17.6)	9 (25.0)	-	.508
1 time/wk	46 (45.1)	13 (36.1)	-	
2–3 times/wk	34 (33.3)	11 (30.6)	-	
> 4 times/wk	4 (3.9)	3 (8.3)	-	

TL = Turkish liras.

^aChi-square test.^bANOVA test.

that RSS, LES, irritability, and total SLEES levels were mediators in the relationship between VAS levels and psychosocial QoL levels (respectively: $\beta = -0.82$, 95% CI: $-1.7513, -0.0430$; $\beta = -0.71$, 95% CI: $-1.5419, -0.0394$; $\beta = -0.71$, 95% CI: $-1.5170, -0.1131$; $\beta = -0.89$, 95% CI: $-1.8356, -0.1581$).

This indicates partial mediation. Partial mediation indicates that some of the relationship between VAS levels and psychosocial QoL levels occurs directly, while some is indirectly based on RSS, LES, irritability, and total SLEES levels.³⁰ The results of the mediation analyses are presented in Fig 2.

Table 2 Mean ± SD Scale Scores of the Study Groups

	Mi (n = 102)	TTH (n = 36)	HC (n = 62)	F/Chi ² P value ^a	Comparisons
VAS	7.31 ± 1.51	6.75 ± 1.51	–	P = .057 ^b	–
RSS	29.28 ± 5.35	29.77 ± 5.74	32.50 ± 3.97	F = 8.138 P < .001	Mi = TTH (P = .614) Mi > HC (P < .001) TTH > HC (P = .011)
LES scores	28.16 ± 8.79	27.63 ± 9.51	24.14 ± 7.69	F = 4.405 P = .013	Mi = TTH (P = .752) M > HC (P = .004) TTH = HC (P = .054)
Irritability	17.81 ± 5.49	17.63 ± 6.11	14.67 ± 3.22	F = 8.071 P = .000	Mi = TTH (P = .858) M > HC (P < .000) TTH > HC (P = .006)
Intrusiveness	13.08 ± 3.40	13.38 ± 3.85	12.14 ± 3.37	F = 1.945 P = .146	Mi = TTH (P = .656) Mi = HC (P = .094) TTH = HC (P = .089)
Total SLEES	59.06 ± 14.29	58.66 ± 14.44	50.96 ± 10.03	F = 7.913 P = .000	Mi = TTH (P = .875) Mi > HC (P < .001) TTH > HC (P = .006)
Physical QoL	65.83 ± 20.46	66.05 ± 18.34	80.64 ± 16.94	F = 12.805 P = .000	Mi = TTH (P = .953) Mi > HC (P < .001) TTH > HC (P < .001)
Psychosocial QoL	66.01 ± 16.06	71.20 ± 14.44	82.12 ± 11.87	F = 23.538 P = .000	Mi = TTH (P = .068) Mi > HC (P < .001) TTH > HC (P < .001)
Total QoL	65.95 ± 15.76	69.41 ± 14.10	81.60 ± 12.44	F = 22.845 P = .000	Mi = TTH (P = .220) Mi > HC (P < .001) TTH > HC (P < .001)
Emotional problems	4.52 ± 2.41	4.58 ± 1.99	2.98 ± 2.30	F = 9.758 P = .000	Mi = TTH (P = .904) Mi > HC (P < .001) TTH > HC (P = .001)
Behavior problems	1.80 ± 1.56	1.69 ± 1.50	1.29 ± 1.33	F = 2.343 P = .099	Mi = TTH (P = .705) Mi = HC (P = .033) TTH = HC (P < .197)
Attention deficit/ hyperactivity problems	4.15 ± 2.23	3.97 ± 2.27	2.40 ± 1.70	F = 14.333 P = .000	Mi = TTH (P = .649) Mi > HC (P < .001) TTH > HC (P < .001)
Peer problems	3.05 ± 1.69	3.08 ± 1.74	2.87 ± 1.54	F = 0.297 P = .744	Mi = TTH (P = .939) Mi = HC (P = .482) TTH = HC (P = .542)
Social behavior skills	8.34 ± 1.60	7.88 ± 1.83	8.69 ± 1.53	F = 2.823 P = .062	Mi = TTH (P = .151) Mi = HC (P = .182) TTH = HC (P < .019)

HC = healthy control; LES = lack of emotional support subscale; Mi = migraine; RSS = Rosenberg Self-Esteem Scale; SLEES = Shortened Level of Expressed Emotion Scale; QoL = quality of life; TTH = tension-type headache; VAS = visual analog scale.

^aANOVA test.

^bIndependent-sample t test.

Discussion

In the present study, adolescents with migraine exhibited significantly higher perceived EE, perceived LES, and perceived irritability compared to the healthy controls. Adolescents with TTH also exhibited higher perceived EE and perceived irritability compared to the healthy controls. In terms of self-esteem, the adolescents with migraine and TTH reported lower levels

than their healthy peers. When the groups were compared in terms of psychologic symptoms, adolescents with migraine and TTH had higher levels of emotional problems and attention-deficit/hyperactivity problems than their healthy peers. No significant difference was found between migraine and TTH groups in all scale scores. According to these findings, higher levels of total perceived EE, LES, and irritability were associated with higher pain severity, and higher levels of

Table 3 Correlation Between Pain Severity, Psychiatric Symptoms, and Scale Scores in all Patient Groups

	VAS	RSS	LES	Irritability	Intrusiveness	Total SLEES scores	Physical QoL	Psychosocial QoL	Total QoL	Emotional problems	Behavior problems	Attention deficit/hyperactivity problems	Peer problems	Social behavior skills
VAS	r	-	-0.176	0.179	0.194	0.044	0.199	-0.067	-0.242	-0.192	0.113	0.142	0.037	0.125
	P	-	.039	.036	.023	.611	.019	.437	.004	.024	.188	.096	.664	.145
Psychosocial QoL	r	-0.242	-0.242	-0.418	-0.391	-0.207	-0.468	0.583	-	0.931	-0.427	-0.364	-0.424	-0.31
	P	.004	.004	<.001	<.001	.015	<.001	<.001	-	<.001	<.001	<.001	<.001	<.001

VAS = visual analog scale; RSS = Rosenberg Self-Esteem Scale; LES = lack of emotional support subscale; SLEES = Shortened Level of Expressed Emotion Scale; QoL = quality of life.

self-esteem were associated with lower pain severity in the total headache group. Finally, RSS, total SLEES score, LES, and irritability subscale scores were found to be partial mediating factors in the relationship between pain severity and psychosocial QoL.

There are limited data in the literature about the relationship between emotional/behavioral problems and family climate in children with primary headache.³¹ Some studies suggest that families of chronic pain patients may affect the healing or maintenance of the disease.^{32,33} The importance of EE has been revealed due to the strong relationship between family interaction and the mental health of family members.¹¹ A study evaluating the relationship between EE and chronic pain found that families tend to express higher emotional overinvolvement and criticism against chronic pain patients.¹⁷ In another study evaluating perceived EE in obese adolescents, the study group reported higher levels of perceived EE than their healthy peers.¹⁵ Another study found that adolescents with diabetes mellitus also reported increased levels of perceived EE compared to

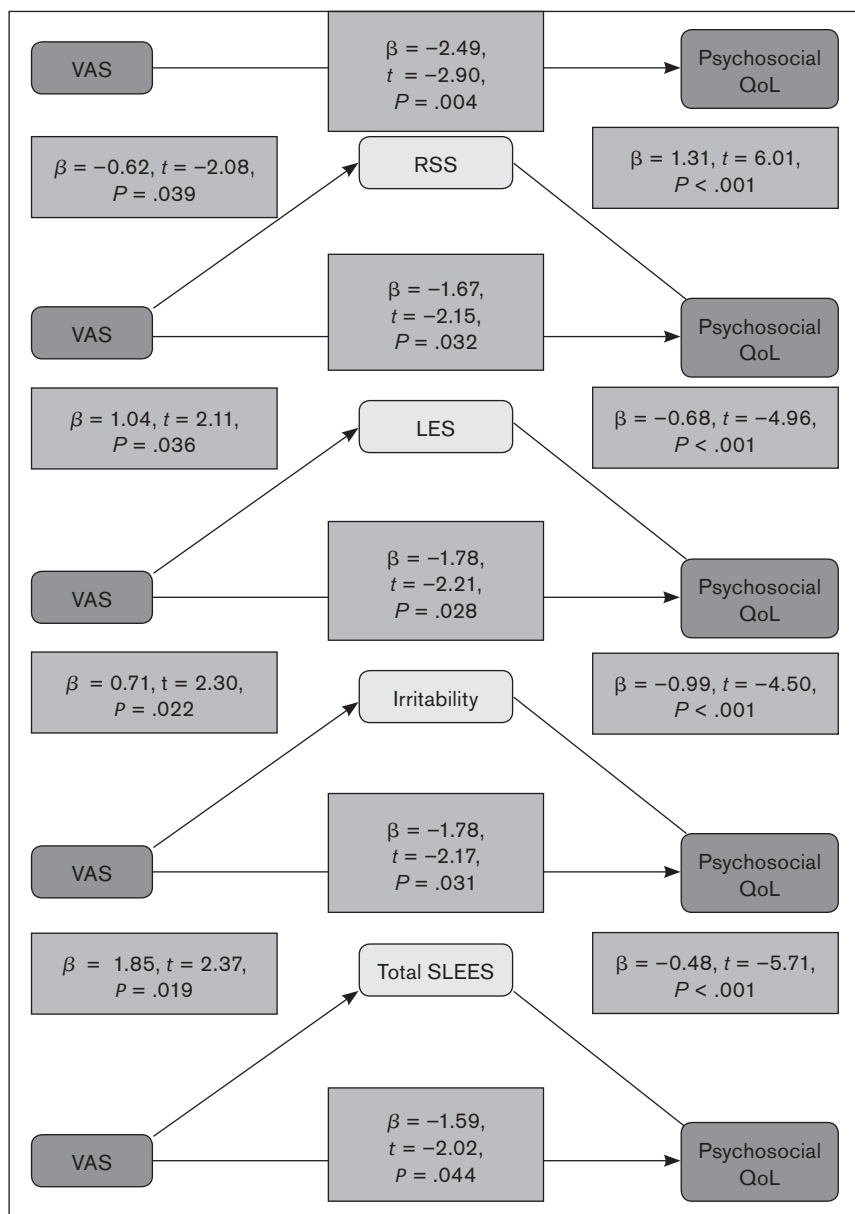


Fig 2 Mediation effects of psychologic factors. LES = lack of emotional support subscale (SLEES); QoL = quality of life; RSS = Rosenberg Self-Esteem Scale; SLEES = Shortened Level of Expression Emotion Scale; VAS = visual analog scale.

their healthy peers.¹⁴ The results of a controlled study indicated that perceived EE was significantly higher in adolescents with iron deficiency anemia than their healthy peers.³⁴ In the present study, the examination of the perceived EE results for all three groups revealed that the migraine and TTH groups reported significantly higher perceived EE compared to the control group. This was primarily a result of higher scores on the irritability subscales, indicating that adolescents with primary headaches describe their families as more irritating. In addition, adolescents with migraine also reported feeling less emotional support. Similarly, obese adolescents were found to perceive significantly lower emotional support, higher irritability, and greater intrusiveness than their healthy peers.¹⁵ Another study revealed that adolescents with diabetes mellitus feel less emotional support than their healthy peers.¹⁴ Adolescents with iron deficiency anemia have described their families as more irritating and more intrusive.¹⁶ The presence of similar negative perceptions in adolescents with primary headaches found in the present study is in accordance with the literature, which reports that adolescents with physical problems had a more negative perception of the family climate than their healthy peers.

In a meta-analysis study, it was stated that internalization problems are more common than externalization problems in children and adolescents with chronic physical illness, including headaches.³⁵ Consistent with this, in another study, patients with primary headaches were shown to be more likely to experience anxiety and depression than other psychologic problems.³⁶ In the sample of the present study, emotional problems were more common in both adolescents with migraine and adolescents with TTH than in their healthy peers. On the other hand, externalizing problems have also been associated with headaches. In the literature, attention-deficit hyperactivity disorder (ADHD) and oppositional defiant disorder have been reported to be more common in children with migraine and TTH than in the general pediatric population.^{37,38} Similar to these findings, ADHD symptoms were more common in adolescents with migraine or TTH than their healthy peers in the present study. There are some studies in the literature stating that there are some differences between psychosocial variables and QoL between children with migraine and TTH,^{39,40} as well as publications stating that there is no difference between these groups in terms of psychosocial variables and QoL.^{41,42} In this study, no significant difference was observed between migraine and TTH groups in terms of any scale score. This may be related to the similar headache parameters (pain severity, pain duration, and pain fre-

quency) between the two groups and the fact that the sample sizes were of medium size.

It has been reported that various psychologic problems can be seen in children and adolescents with headaches and that self-esteem has a developmental process in this period of life. In this context, it was thought that the development of self-esteem in children and adolescents with headaches may be affected by these psychologic problems. According to the literature investigating self-esteem in children with migraine, their self-esteem was found to be significantly lower in social, emotional, familial, and physical areas compared to their healthy peers,⁴³ and low self-esteem was evaluated in relation to higher psychologic symptoms and more severe headaches.^{44,45} In the present study, the self-esteem of both adolescents with migraine and TTH was lower than their healthy peers. Various psychosocial difficulties in the adolescents with primary headaches in the sample of the study may have influenced the development of self-esteem of these young people, in accordance with the literature. Further studies are needed to increase understanding of this subject.

Studies on the QoL of children with headaches have emphasized the evaluation of low self-esteem, as well as psychologic disorders such as depression and anxiety.^{46,47} In addition, significant relationships between EE and QoL were reported in physical illnesses, which were associated with a number of outcomes of physical illness.^{17,48} In the total headache group of the present study, it was seen that psychosocial QoL has a significant relationship with almost all psychologic variables evaluated. Considering the significant relationship between headache and psychosocial QoL, evaluating the factors that can mediate this effect can give an idea about which psychologic factors should be taken into consideration during the follow-up of adolescents with headache. In this context, self-esteem, total perceived EE, LES subscale, and perceived irritability subscale, which were associated with both severity of headache and psychosocial QoL, were found to be mediating factors and have been shown to have partial mediating effects. When the literature was examined, headache severity was found to be significantly associated with self-esteem.^{9,49} Although there are limited data about the relationship between EE and headache severity in the literature, it has been shown that there is a significant relationship between the severity of chronic pain and EE.¹⁷ The possible mediating effect of self-esteem and EE in the relationship between headache severity and QoL has never been investigated before. In the present study, it was revealed that self-perception (self-esteem) and family climate perception (perceived EE) of adolescents with primary headache have a partial mediating effect in the

relationship between headache severity and psychosocial QoL. While evaluating the psychosocial QoL, which is an important target in the headache management process, consideration of self-esteem and perceived EE can make a significant contribution to treatment and prognosis.

The present study has several limitations, among them the modest sample size of the TTH group, not screening other family members for psychopathology, and not having psychiatrists to examine participants with high scores. The lack of follow-up with the participants can also be viewed as a limitation. There is still controversy regarding the questions of whether primary headache is a risk factor for emotional and mental problems in adolescents and whether changes occur in the psychological state following the treatment period. Follow-up studies are thus necessary to improve our understanding of these relationships to help settle these issues. Generalizability of the results of the present study may be limited in some aspects due to demographic features, such as maternal employment status or parental educational level. Therefore, multicenter studies with larger sample sizes will be useful.

The exclusion of psychopathology in the migraine, TTH, and control groups constitutes a strength of the present study, as does the assessment of EE with a self-report scale designed for adolescents. This study is also the first controlled study to examine the mediation effect of perceived EE and self-esteem on the relationship between pain severity and the patients' psychosocial QoL in adolescents with primary headaches.

Conclusions

The most important result of this study was to show that self-esteem and perceived family climate can be two factors that play an important role in the relationship between headache and psychosocial QoL. The present results suggest that self-esteem and perceived EE in adolescents with primary headaches can be considered as complementary to the assessment and treatment process. Supporting adolescents who are in need as a result of this assessment can be considered as a complementary intervention to the treatment of migraine and TTH. Follow-up studies with a larger sample size that evaluate the effectiveness of psychosocial intervention are needed.

Clinical Implications

- Adolescents with migraine and TTH have high perceived expressed emotion levels and low self-esteem levels.
- Adolescents with migraine and TTH describe their families as more irritating.
- Adolescents with migraine feel less emotional support.
- Self-perception (self-esteem) and family climate perception (perceived EE) of the adolescents with primary headache have a partial mediating effect in the relationship between headache severity and psychosocial QoL.

Acknowledgments

The study design was approved by the Ethics Committee of Giresun University Medical Faculty Ethics Committee (Date: March 10, 2019, No: 03.10.2019/5). The authors received no financial support for the research, authorship, and/or publication of this article. The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. All authors made a substantial contribution to the study conception and design, analysis and interpretation of data, drafting the article or revising it critically for important intellectual content, and final approval of the version to be published.

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