Ways of coping with epilepsy and related factors in adolescence

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The aim of this study was to investigate ways of coping and related factors with regard to the psychopathology of adolescents with epilepsy (AwE). In this study, 41 AwE and 34 healthy controls were assessed. It was found that 24% of AwE had attention problems and 41% had overall problems at a clinical level. The scores for thought problems, attention problems, aggressive behavior and externalizing problems were higher in the epilepsy group. In addition, the AwE had lower self-esteem, and as the adolescents had higher scores for overall problem behavior, they also received lower problem-focused coping scores. As an adolescent's self-esteem increases, problem-focused coping is used more frequently, whereas emotion-focused coping is used less frequently. It is suggested that interventions to help adolescents improve their strategies for coping with stress may mitigate some of the problems with adaptive functioning, which are common in AwE.

Key words: epilepsy, adolescence, problem-focused coping, emotion-focused coping, self-esteem, psychopathology, maternal coping, maternal psychopathology, attention problems, psychosocial adaptation.

Epilepsy is the most common neurological disorder affecting adolescents. It is episodic and unexpected but still chronic in nature[1-3]. Having a chronic illness by itself subjects a person to possible developmental and psychosocial negativity at all ages. Developmentally, adolescence is the period of identity formation and is a critical period for developmental tasks such as body mastery, impulse control and independence. It is thus especially important to understand how adolescents with epilepsy (AwE) cope with this illness in their lives and how living with epilepsy can influence their present as well as their future psychosocial health. As seen in most chronic illnesses, adolescents and children with epilepsy have an increased risk of psychosocial difficulties and mental health problems. However, they experience such difficulties with greater frequency than those diagnosed with other chronic illnesses. In comparison studies, psychiatric disorders were found in 37% of children with epilepsy, in 11% of children with other chronic illnesses and in 9% of the healthy control group[4]. In short, they can be defined as a vulnerable group due to the restricting effect of epilepsy on the social, emotional and educational life of an adolescent[5]. The prevalence of mental health problems in children and AwE ranges from 16% to 77%[6-9]. On the other hand, a history of psychiatric disorder among children and adolescents is a risk factor for the development of epilepsy. The risks are highest among boys aged 6 to 12 years who have a psychiatric diagnosis[10]. In a recent meta analysis, it was observed that a broad range of mental health problems are related with epilepsy[9,11]. Of these, internalizing and attention problems are the most commonly identified through either self-reports or by using structured instruments[9]. Depression is more common than in the general population, and has been identified as a key risk factor for lower quality of life and increased rates of suicide among patients who have epilepsy[10]. Disorders of attention have long been recognized in both children and adults who have epilepsy. The prevalence of attention deficit hyperactivity disorder among children and AwE ranges between 14-38%[9]. Unlike

adults with epilepsy, psychoses have rarely been described in children and adolescents[10]. Many risk factors related to psychiatric problems were identified, including illness-specific factors (e.g. seizure type, frequency, etiology, age at onset, type and number of antiepileptic drugs, treatment duration), the child's developmental stage, mental retardation, learning problems, cognition, family functioning and health-related quality of life[9,12]. Of these risk factors, some familial variables were found to be related with coping abilities, such as children's sense of self-confidence, communication, broad social support, adaptation, and general well-being. In addition, behavioral problems were found to be negatively correlated with these coping abilities[2].

Having effective ways of coping is found to be an important mediating variable between life stressors and psychosocial adjustment in chronic illnesses[13]. An individual's method of coping with stress is found to affect not only their mental health, but their physical and social well-being as well[14]. Although coping and psychosocial adjustment have been explored in many aspects of various chronic illnesses, research on the coping styles of AwE is sparse. On the other hand, in the case of epilepsy, the coping assessment is found to be important due to its influence on the well-being of patients[15]. Furthermore, maternal coping resources were found as the primary predictor of mothers' responses to their children's medical condition, which is important in the psychosocial adjustment of children and adolescents[16]. Thus, understanding the effect of both the mothers' and adolescents' coping strategies with epilepsy in relation to the psychopathology will enlighten research aiming to explore the formulations of psychopathology in AwE. We hypothesized that AwE would differ from the control group in their coping strategies, and that they would have lower self-esteem and higher parent-reported psychopathology. As for coping strategies, we expected to find corresponding styles between the adolescents and their mothers; we also expected to see parent-reported psychopathology associated with inefficient ways of coping with stress in both adolescents and mothers.

Material and Methods

The study assessed 41 AwE (17 girls, 24 boys), who attended the first pediatric clinic of Lütfi Kırdar Kartal Training and Research Hospital and 34 healthy adolescents (15 girls, 19 boys). Adolescents aged between 13 and 16 years with idiopathic epilepsy who had been regularly followed at the same pediatric clinic for at least one year were invited to participate in the epilepsy group. Adolescents with other chronic illnesses in addition to epilepsy, or those with abnormal neurological examinations, as well as those who were mentally retarded were excluded from the study group. The control group was comprised of adolescents who were matched with the epilepsy group for age and gender, who were referred consecutively to other pediatric clinics of the same hospital with acute physical complaints and a diagnosis of an acute infectious disease, and who voluntarily consented to participate. The exclusion criteria for the control group were the presence of any type of chronic disorder or intellectual insufficiency. Informed consent was obtained from the parents and the adolescents in both the epilepsy and control groups.

The sociodemographic data and medical history were taken from mothers using an interview form prepared by the investigators. Clinic follow-up charts were also used where needed. The interview form prepared by the investigators included questions regarding sociodemographic information and features related to epilepsy such as the duration of the illness, seizure type and frequency and medication used. Intellectual insufficiency was determined by the presence of past mental retardation diagnosis, past or present special education history or school failure (defined as a grade retention of more than two consecutive years). School performance was classified based on the information obtained from the school. In high schools in Turkey, grades range between 0 and 5. Students with cumulative year grade from 4.5 to 5 obtain a high honor degree and from 4 to 4.5 obtain an honor degree. Adolescents with high honor and honor degree were classified as having high school performance; those with passing grades but no honor degree were classified as having medium school performance; and those with one to three failing grades but no grade retention were classified as having low school performance. Socioeconomic status was classified on the basis of family income. Subminimum wage was classified as low socioeconomic level; between minimum wage and its two-fold

as medium; between 2-3 x minimum wage as high; and >3 x the minimum wage as very high. Mothers were interviewed and asked to complete a Child Behavior Checklist (CBCL), Ways of Coping Inventory (WCI) and Symptom Checklist-90-Revised (SCL-90-R) to evaluate adolescents' problem behaviors, maternal coping mechanisms and maternal psychopathological symptoms, respectively. Adolescents filled out the Rosenberg Self-Esteem Scale (RSES) and WCI.

The CBCL for ages 4-18 aims to obtain standardized data on children's problem behaviors as reported by their parents. The CBCL identifies the symptoms of problem behaviors on a 118-item questionnaire. The items make up eight syndrome subscales: (1) withdrawn, (2) somatic complaints, (3) anxious/depressed, (4) social problems, (5) thought problems, (6) attention problems, (7) delinquent behavior, and (8) aggressive behavior. Scores for total behavior problems, internalizing problems, and externalizing problems are derived from these eight subscales. A T-score of 67–70 indicates a borderline clinical range, while a T-score greater than 70 (90th percentile) is indicative of clinically significant behavior[17]. The adaptation and standardization for Turkish children was done by Erol et al.[18].

The SCL-90-R, a self-rating inventory, was used to assess psychopathologic symptoms with nine clinical scales for somatization, obsessive compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism[19]. Global Symptom Index (GSI) scores >1.00 are considered to indicate symptoms on psychopathology levels[20].

The RSES is a 10-item Likert scale with items answered using a four-point scale -from strongly agree to strongly disagree- developed by Rosenberg[21]. The sensitivity and specificity adjustment for Turkish society was done by Çuhadaroğlu[22]. Cronbach alpha was 0.71. Scores range between 0 to 6 and higher scores indicate a lower self-esteem; when classifying, scores of 0-1 indicated a high self-esteem, of 2-4 medium and of 5-6 a low self-esteem for the Turkish adolescent population.

To explore different ways of coping in stressful situations[23], the Turkish version of the Ways of Coping Inventory (TWCI) was used. Due to Turkish people's tendency to rely on superstitious beliefs and fatalism as a coping style, six more items addressing these domains were included in the Turkish version of the inventory. Şahin and Durak[24] used the TWCI in a study conducted with university students, and reduced the number of items to 30. The factor analysis conducted yielded five similar factors, namely, self-confidence, optimism, submissiveness, helplessness, and seeking social support. Cronbach alpha values for the internal consistency for each subscale are: self-confidence=0.69, optimism=0.63, submissiveness=0.68, helplessness=0.67, and seeking social support=0.72. They also proposed that these factors can be grouped into two dimensional coping styles - problem-focused efficient ways of coping (self-confidence, optimism, seeking social support) and emotion-focused inefficient ways of coping (submissiveness, helplessness).

Statistical Analysis

The analysis of the data was carried out using the Statistical Program for Social Sciences (SPSS) version 13.0. In the analysis, categorical data were statistically analyzed with chi-square and Fisher's exact tests. In the evaluation of the continuous data, the t test (the significance of the difference between two means) was used when the assumptions of the parametric test were met. All analyses were two-ended and $p<0.05$ was considered statistically significant.

Results

Forty-one AwE and 34 control adolescents participated in the study. There was no significant difference in the age, sex ratio, mother's age, mother's occupation, socioeconomic level, or school performance between the epilepsy group and the control group. All participants had low or medium socioeconomic status. The sociodemographic data for the epilepsy group and the control group are summarized in Table I. None of the adolescents in the epilepsy group or the control group had any kind of psychiatric evaluation or psychotropic medication histories before the study. All AwE were diagnosed as idiopathic epilepsy. Mean age of seizure onset was 6.72±3.54 years. Seizure type was generalized for 37 (90.2%) adolescents, while 3 adolescents had secondarily generalized seizures and 1 adolescent had partial seizure. The seizure frequency ranged between 1 and

Table I. Sociodemographic Profile of the Sample and Characteristics of Adolescents with Epilepsy

	Epilepsy	Control	Statistics	Significance
Number	41	34		
Age in years (mean ± SD)	14±1.16	13.9±1.09	t:0.375	p=0.708 (NS)
Male/Female	24/17	19/15	x^2:0.054	p=0.817 (NS)
Mother's age in years (mean ± SD)	39.62±6.19	37.78±5.17	t:1.400	p=0.166 (NS)
Mother's Education				
No education	7	4	x^2:0.814	p=0.367 (NS)
Elementary school	34	30		
Mother's Occupation				
Housewife	38	31	x^2:0.041	p=0.839 (NS)
Laborer	3	3		
Socioeconomic Status				
Medium	21	15	x^2:1.050	p=0.306 (NS)
Low	20	19		
School Performance				
High	9	5		
Medium	14	17	x^2:2.285	p=0.319 (NS)
Low	18	11		

SD: Standard deviation. NS: Non-significant.

20-25 (7.23±5.87 mean) seizures per year and the seizure frequency median was 4 per year. Distribution of seizure frequency within AwE was as follows: 13 had more than 1 seizure per month, 25 had 1-3 seizures per 6 months, and 3 had less than 2 seizures per year. All adolescents in the epilepsy group were on monotherapy. They were given valproate (n: 20), carbamazepine (n: 20), and phenytoin (n: 1).

When the CBCL subtest scores were compared between the two groups, thought problems, attention problems, aggressive behavior, externalizing problems and total problems scores were significantly higher for the epilepsy group (t:2.013 p=0.048; t:3.560 p=0.001; t:2.030 p=0.046; t:2.324 p=0.023; t:2.431 p=0.018). Withdrawn, somatic complaints, anxious/depressed, social problems, delinquent behavior and internalizing problems subtest scores did not differ between the epilepsy and the control group. CBCL scores for both groups are presented in Table II. When boys and girls were compared in both groups, the attention problems subtest scores were found to be significantly higher in the boys in the epilepsy group (t:2.093 p=0.043).

When the CBCL scores were classified as being in the sub-threshold, borderline or clinical range and the two groups were compared again, borderline and clinical range attention

Table II. Child Behavior Checklist Scores

	Epilepsy	Control	Statistics	Significance
Withdrawn	60.24	56.41	t:1.881	p=0.064
Somatic complaints	54.76	53.35	t:0.924	p=0.358
Anxious/depressed	63.22	60.26	t:1.582	p=0.118
Social problems	59.85	57.65	t:1.174	p=0.244
Thought problems	62.37	58.35	t:2.013	p=0.048 (S)
Attention problems	65.17	58.94	t:3.560	p=0.001 (S)
Delinquent behavior	56.63	54.15	t:1.615	p=0.111
Aggressive behavior	59.20	55.74	t:2.030	p=0.046 (S)
Internalizing problems	61.22	57.24	t:1.891	p=0.063
Externalizing problems	57.71	52.68	t:2.324	p=0.023 (S)
Total problems	62.20	57.53	t:2.431	p=0.018 (S)

S: Significant.

problems and total problems were found to be significantly more in the epilepsy group (x^2:12.719 p=0.002; x^2:6.186 p=0.045). The CBCL subtests at clinical level for both groups are given in Table III.

The RSES mean scores for the epilepsy and the control groups were 2.10±1.685 and 1.62±1.129, respectively. There was no significant difference in the RSES mean scores between the epilepsy and the control group or between the boys and girls in both groups. For self-esteem status, AwE were found to have significantly lower self-esteem when compared with controls (x^2:6.143 p=0.046). The RSES results for both groups are shown in Table IV. The RSES scores did not differ between the two (low and medium) socioeconomic statuses. When the RSES scores were compared between the three groups allocated according to school performance, adolescents with low school performance had significantly lower RSES scores (F:4.322 p=0.017).

The RSES scores were negatively correlated with social problems, attention problems and total problems subtest scores for both the epilepsy and control groups (r:0.330 p=0.004; r:0.428 p=0.012; r:0.239 p=0.039). In other words, lower self-esteem and social, attention and total problems on the CBCL were mutually related.

When the scores from the TWCI were compared, AwE were found to have lower self-confidence scores and overall lower problem-focused efficient ways of coping scores than the control group (t:3.435 p=0.001; t:3.072 p=0.003). Adolescent girls with epilepsy had the overall lowest scores in self-confidence and problem-focused efficient ways of coping subtests compared to adolescent boys with epilepsy (t:2.465 p=0.018; t:2.139 p=0.039). Table V summarizes the TWCI scores in both groups.

The RSES scores were correlated with problem-focused efficient ways and emotion-focused inefficient ways of coping scores for both the epilepsy and control groups (r:0.402 p<0.001; r:0.425 p<0.001). In other words, lower self-esteem and emotion-focused inefficient coping and higher self-esteem and problem-focused efficient ways of coping scores were associated. Additionally, in the epilepsy group, self-confidence, optimism, helplessness, and seeking social support scores were correlated with RSES scores (r: 0.416 p<0.001; r:0.248 p=0.032; r: 0.408 p=0.001; r:0.288 p=0.012).

Table III. Child Behavior Checklist Subtests at Clinical Level

	Epilepsy (n=41) n (%)	Control (n=34) n (%)	Statistics	Significance
Withdrawn	6 (15)	1 (3)	x^2:4.654	p=0.098
Somatic complaints	3 (7)	0	x^2:2.945	p=0.229
Anxious/depressed	5 (12)	6 (18)	x^2:5.889	p=0.053
Social problems	3 (7)	0	x^2:3.439	p=0.179
Thought problems	7 (17)	2 (6)	x^2:2.987	p=0.225
Attention problems	10 (24)	2 (6)	x^2:12.719	p=0.002 (S)
Delinquent behavior	2 (5)	0	x^2:3.234	p=0.199
Aggressive behavior	4 (9)	1 (3)	x^2:1.401	p=0.496
Internalizing problems	18 (44)	11 (32)	x^2:5.686	p=0.058
Externalizing problems	8 (20)	4 (12)	x^2:2.257	p=0.323
Total problems	17 (41)	9 (26)	x^2:6.186	p=0.045 (S)

S: Significant.

Table IV. Rosenberg Self-Esteem Scale Results

Self-Esteem	Epilepsy n (%)	Control n (%)	Statistics	Significance
Low	6 (15%)	0		
Medium	18 (44%)	14 (41%)	x^2: 6.143	p=0.046 (S)
High	17 (41%)	20 (59%)		

S: Significant.

Table V. Adolescents' Scores on the Turkish Version of the Ways of Coping Inventory

	Epilepsy Mean ± SD	Control Mean ± SD	Statistics	Significance
Ways of coping				
Self-confidence	12.98 ± 4.51	16.06 ± 2.902	t:3.573	p=0.001 (S)
Optimism	9.68 ± 3.496	10.76 ± 2.323	t:1.543	p=0.127
Helplessness	12.12 ± 4.190	11.29 ± 3.865	t:0.882	p=0.381
Submissiveness	6.76 ± 4.176	6.50 ± 4.216	t:0.263	p=0.793
Seeking social support	5.73 ± 2.802	6.65 ± 1.937	t:1.611	p=0.111
Problem-focused coping	28.39 ± 8.29	33.47 ± 5.38	t:3.193	p=0.002 (S)
Emotion-focused coping	18.87 ± 6.62	17.79 ± 7.36	t:0.671	p=0.505

SD: Standard deviation. S: Significant.

The total problems subtest scores on the CBCL and problem-focused efficient ways of coping scores on the TWCI were inversely correlated; adolescents with higher scores for total problem behaviors, also had lower scores for problem-focused efficient ways of coping (r:0.246 p=0.033).

There was no significant difference in the GSI in the SCL-90-R completed by the mothers between the two groups (Table VI). Four (12%) mothers from the control and 6 (15%) mothers from the epilepsy group had GSI >1 as a measure of psychopathology in the SCL-90-R. When the mothers' GSI scores and the adolescents' CBCL scores were correlated for the epilepsy and the control groups separately, none of the subtest scores on the CBCL in the control group were associated with the mothers' GSI scores. For the epilepsy group, the mothers' GSI scores were correlated with anxious/depressed, attention problems, delinquent behavior, aggressive behavior, external problems, and total problems scores (r:0.315 p=0.042; r:0.323 p=0.039; r:0.464 p=0.002; r:0.411 p=0.008; r:0.487 p=0.001; r:0.446 p=0.003).

The mothers' coping profiles did not show a significant difference between the epilepsy group and the control group (Table VI). The mothers' coping profiles were not found to be correlated with the adolescents'. The mothers' emotion-focused inefficient ways of coping scores were correlated with GSI scores on SCL-90-R in the epilepsy group but not in the control group (r:0.725 p<0.001).

No significant relationship was found between seizure frequency, duration of the illness, antiepileptic medication used and the CBCL, RSES or TWCI scores. Seizure types were not analyzed due to insufficient number of AwE in distribution; 90.2% (n=37) of the adolescents had generalized seizures.

Table VI. Mothers' Scores on the Turkish Version of the Ways of Coping Inventory and GSI of Symptom Checklist-90-Revised

	Epilepsy Mean ± SD	Control Mean ± SD	Statistics	Significance
Ways of coping				
Self-confidence	13.90 ± 4.603	14.91 ± 4.166	t:0.986	p=0.327
Optimism	9.41 ± 3.194	10.35 ± 2.806	t:1.338	p=0.185
Helplessness	13.00 ± 4.791	11.06 ± 4.709	t:1.338	p=0.185
Submissiveness	9.02 ± 4.168	8.71 ± 3.974	t:0.336	p=0.738
Seeking social support	6.32 ± 2.815	6.59 ± 1.95	t:0.474	p=0.637
Problem-focused coping	29.63 ± 8.51	31.85 ± 6.57	t:1.243	p=0.218
Emotion-focused coping	22.02 ± 7.99	19.76 ± 7.22	t:1.272	p=0.207
GSI on SCL-90-R	1.02 ± 0.714	0.86 ± 0.55	t:1.060	p=0.293

SD: Standard deviation. GSI: Global Symptom Index.

Discussion

Adolescents with epilepsy are a unique group with an episodic but chronic illness during a critical developmental stage of their lives. Even though it is accompanied by these unique features, AwE have not been sufficiently studied and are not well understood in terms of their coping strategies and related risk. Furthermore, the literature on the coping strategies of AwE and their relationship to maternal coping and psychopathology is scant. In this study, we observed that AwE have higher levels of parent-reported psychopathology, lower self-esteem and use less self-confident and problem-focused ways of coping in comparison to healthy adolescents. The coping strategies of AwE and healthy adolescents were not correlated with maternal coping strategies. Problem-focused ways of coping, higher self-esteem and lower levels of parent-reported psychopathology are associated. It is thought that these findings will be important in planning interventions aimed to support self-esteem and to improve coping resources as a preventive approach in adolescents.

The prevalence of psychiatric problems among AwE according to the total problem scores as assessed by the CBCL was 41%, a result similar to previous studies[4]. Of these, thought problems, attention problems, aggressive behavior, externalizing problems, total problem scores, and at the clinical level, attention problems in particular (24%), were found to be significantly higher in AwE. In studies of mental health problems associated with epilepsy, it is seen that the CBCL is widely used and accepted as a valid and reliable instrument[25]. In a meta-analysis of studies that mostly used the CBCL, both externalizing and internalizing problems were found to be higher in children with epilepsy. It was also found that attention problems, thought problems and social problems are relatively specific to epilepsy[26]. Similarly, in our study, attention and thought problem scores were found to be higher. Of the subtests of the CBCL, only the attention and total problems subtests achieved a significant level within the clinical range. Our result indicating increased attention problems at the clinical level in AwE was also consistent with the literature[26]. This result can be related to the cognitive impairment associated with epilepsy. It is widely recognized that the risk of cognitive impairment increases in patients with epilepsy due to an underlying brain dysfunction[4,27]. This is also a significant problem when patients' perceptions about epilepsy are considered. The most influential adverse effect of epilepsy in the life of patients is reported as cognitive impairments, including attention problems[28]. Although a high level of attention problems were reported by mothers, we observed that none of the AwE had had any kind of psychiatric evaluation or psychotropic medication before the study. It is an important finding of the study that although adolescents do not get help for their attention problems, these problems may have a disturbing impact on their lives and should be evaluated carefully. Unlike most studies in the literature, in the present study, the internalizing problem scores did not differ significantly between groups, and the statistical significance of the anxious/depressed subtest and internalizing problems at a clinical level were close to being statistically significant (Table III). Nevertheless, similar to our result, Baker et al.[7] reported non-significant results for total scores, negative mood subscale, ineffectiveness and negative self-esteem on the Children's Depression Inventory and the Birleson Depression Scale in AwE when compared to healthy controls. It is possible that internalizing problems were overlooked in our study as they were only evaluated based on the mothers' reports. In the literature, it has been shown that the parent-child agreement on difficulties is very low by CBCL reports[29]. In a meta analysis investigating psychopathology in children and AwE, the effect sizes for externalizing problems were found to be larger for parent- and teacher-reported problems and the effect sizes for internalizing problems were found to be larger when self-reported by children and AwE, which are considered to be more accurate indicators of internalizing problems[11]. The adolescents' own reports about their inner world and emotions could yield different results for internalizing problems in a larger group of AwE. Furthermore, as a plausible explanation, it is also possible that mothers report their children as psychiatrically well because they perceive the symptoms of depression or anxiety as non-psychiatric problems that emerge as an expected outcome of their children's chronic illness. Another aspect is that many depressed

epileptic patients do not have a classic major depression and rather have a diagnosis of "depression not otherwise specified"; therefore, as mentioned in the literature, the standard screening tools for depression may prove inadequate in epilepsy[10].

Low self-esteem was prevalent in AwE. Studies show that children with epilepsy have lower self- esteem when compared to healthy controls[7,30,31]. Adolescents in our study group had frequent seizures (92% had 2 or more seizures during the preceding year), and these frequent seizures and higher attention problems may have adversely influenced self-esteem. It has been found that attention problems, their associated learning problems and the epilepsy itself disrupt the patients' sense of control and competence[7,32,33]. In clinical practice, it is very important to evaluate self-esteem in adolescents because self-esteem plays a critical role in identity formation during this developmental stage. Physicians may have to work to overcome the possibility of adolescents identifying with the identity of being ill. Early therapeutic interventions to address attention problems may also affect self-esteem positively.

This study investigated coping strategies as an important and insufficiently studied factor related to adolescents' psychosocial well-being in the case of epilepsy. Coping has been found to be most effective when it combines a variety of different strategies[34]. Both emotion-regulating and problem- solving coping strategies are used in almost all stressful situations[35]. In our study, we observed that AwE, in particular girls in this group, have lower self-confidence and lower overall problem-focused ways of coping scores. This finding suggests that AwE's coping is not effective because they use less problem-focused coping strategies. It is not suitable to generalize and use the findings from studies of adults for adolescents but we were not able to find research on coping strategies of AwE with which we could compare our results. Yet studies showed similar findings, that adults with epilepsy had fewer active ways of coping, which was found to be linked to poor psychosocial outcomes[36-38]. Problem- focused coping is defined by responses such as seeking information, generating possible solutions to a problem, and taking actions to change the circumstances that are creating stress. These coping strategies require the active involvement of the adolescent with the problem, and it is possible that AwE generalize uncontrollability for most life events due to the unpredictable nature of epilepsy, the loss of control of his/her body due to medical treatments and the impact of the illness itself on their lives. In our study group, adolescents experiencing frequent and generalized seizures may have an increased sense of uncontrollability over their life. We also found that lower self-esteem and more emotion-focused coping and higher self-esteem, lower overall psychopathology and more problem-focused coping scores were correlated in both the epilepsy and the control group. In addition, in the epilepsy group, lower self-esteem and helplessness and a higher self-esteem and self-confidence, optimism and seeking social support scores were correlated. The lack of literature on adolescents' coping with epilepsy could be related to problems in the conceptualization and measurement of coping in young people; however, the nature of the stressors and the correlation of the strategies used for coping in AwE remain to be identified. Our findings suggest that enhancing the problem-focused coping strategies of adolescents may play a crucial role in the psychosocial well-being of AwE.

A sex difference was observed for attention problem scores and ways of coping with stress. Attention problems were more frequent in boys in our study. Sex was found to be an inconsistent predictor of attention problems in children with epilepsy[9]. Further studies are required to evaluate and explain the etiological relevance of sex differences in attention problems and epilepsy. In terms of coping strategies, we found that girls had the lowest scores for self-confidence and used less problem-focused efficient ways of coping when compared to adolescent boys with epilepsy. It may be possible to propose a hypothesis related to coping strategies and sex with a larger group of AwE. We can only speculate about the need to research a possible tendency towards anxiety and depression in girls with epilepsy that may be related to inefficient ways of coping with stress.

There was no significant difference between the two groups in the GSI in the SCL-90-R completed by the mothers. The mothers' GSI scores were correlated with adolescents' anxious/depressed, attention problems, delinquent

behavior, aggressive behavior, external problems and total problems scores in the epilepsy group. Maternal and adolescent psychopathology appears to be more closely related in the epilepsy group. There is a need to explore maternal factors in a larger group of AwE. Mothers' coping profiles did not indicate a significant difference in the epilepsy and the control group and did not correlate with the adolescents' ways of coping. In this study, we found no relationship between maternal coping strategies and that of the adolescents as we hypothesized. This may be explained by either the separation-individuation process of adolescence or the exclusion of the fathers' coping strategies and other familial factors that could be crucial. The mothers of children with epilepsy were found to have good adaptation and a similar level of psychiatric morbidity on self-report rating scales[39-42]. In our culture, the mothers' psychological well-being may be explained by the presence of social support from their relatives. This may protect them from depression and/or anxiety disorders. A parent's role in modeling appropriate coping behavior, providing comfort, nurturing, and providing a sense of physical safety in case of trauma is well known[43]. Family factors impacting the resilience of AwE should be evaluated in future studies.

The major limitations of this study are not using self-report instruments to evaluate the adolescents' own perceptions of their psychological well-being, not having a structured evaluation for intelligence level, and not using structured clinical interviews to determine the psychopathology. In addition, other limitations include having a small sample size, having patients from only the low and medium socioeconomic status categories, not including familial functioning and parenting in the evaluation, and not including the fathers' ways of coping and psychiatric evaluation. Despite its limitations, this study provides a valuable longitudinal perspective on adaptive functioning in AwE. The findings have shown that AwE have significant parent-reported attention problems, low self-esteem and fewer problem-focused coping strategies, and it is suggested that all of these may have a detrimental effect on an adolescent's social development. The data from this study also suggest that interventions that help adolescents develop more resources for coping with stress may mitigate some of the problems regarding adaptive functioning that are common in this group of children.

In conclusion, our study determined significant attention problems and differences in ways of coping in AwE compared to healthy adolescents. Physicians dealing with AwE should carefully evaluate them with respect to psychiatric problems including attention disorders, depressive symptoms and anxiety, which are clinically interrelated symptoms, as possible risk factors for future difficulties. Research on adolescents coping with epilepsy and their strategies and the effects of interventions aiming to support adolescents' coping and self-esteem is scant and needs to be explored. We hope that results of this study will enlighten future studies on coping with epilepsy during adolescence and its relationship to psychopathology. In addition, we hope that the results will also enrich the literature on the points raised, including coping strategies to be improved that could lead to interventions specifically directed to adolescents.

REFERENCES

1. Marin S. The impact of epilepsy on the adolescent adolescent. MCN Am J Matern Child Nurs 2005; 30: 321-326.
2. Admi H, Shaham B. Living with epilepsy: ordinary people coping with extraordinary situations. Qual Health Res 2007; 17: 1178-1187.
3. MacLeod JS, Austin JK. Stigma in the lives of adolescents with epilepsy: a review of the literature. Epilepsy Behav 2003; 4: 112-117.
4. Davies S, Heyman I, Goodman R. A population survey of mental health problems in children with epilepsy. Dev Med Child Neurol 2003; 45: 292-295.
5. Abraham A, Silber TJ, Lyon M. Psychosocial aspects of chronic illness in adolescence. Indian J Pediatr 1999; 66: 447-453.
6. Lossius MI, Clench-Aas J, Van Roy B, Mowinckel P, Gjerstad L. Psychiatric symptoms in adolescents with epilepsy in junior high school in Norway: a population survey. Epilepsy Behav 2006; 9: 286-292.
7. Baker GA, Spector S, McGrath Y, Soteriou H. Impact of epilepsy in adolescence: a UK controlled study. Epilepsy Behav 2005; 6: 556-562.
8. Rodenburg R, Marie Meijer A, Dekovic M, Aldenkamp AP. Family predictors of psychopathology in children with epilepsy. Epilepsia 2006; 47: 601-614.
9. Plioplys S, Dunn DW, Caplan R. 10-year research update review: psychiatric problems in children with epilepsy. J Am Acad Child Adolesc Psychiatry 2007; 46: 1389-1402.

10. Marcangelo MJ, Ovsiew F. Psychiatric aspects of epilepsy. Psychiatr Clin North Am 2007; 30: 781-802.
11. Rodenburg R, Stams GJ, Meijer AM, Aldenkamp AP, Dekovic M. Psychopathology in children with epilepsy: a meta-analysis. J Ped Psychol 2005; 30: 453-468.
12. McCusker CG, Kennedy PJ, Anderson J, Hicks EM, Hanrahan D. Adjustment in children with intractable epilepsy: importance of seizure duration and family factors. Dev Med Child Neurol 2002; 44: 681-687.
13. Meijer SA, Sinnema G, Bijstra JO, Mellenbergh GJ, Wolters WH. Coping styles and locus of control as predictors for psychological adjustment of adolescents with a chronic illness. Soc Sci Med 2002; 54: 1453-1461.
14 Piko B. Gender differences and similarities in adolescents' ways of coping. The Psychological Record 2001; 51: 223-236.
15. Piazzini A, Ramaglia G, Turner K, et al. Coping strategies in epilepsy: 50 drug-resistant and 50 seizure-free patients. Seizure 2007; 16: 211-217.
16. Chapieski L, Brewer V, Evankovich K, Culhane-Shelburne K, Zelman K, Alexander A. Adaptive functioning in children with seizures: impact of maternal anxiety about epilepsy. Epilepsy Behav 2005; 7: 246-252.
17. Achenbach TM. Manual for the Child Behaviour Checklist/4-18 and 1991 Profile. Burlington, VT: University of Vermont, Department of Psychiatry; 1991.
18. Erol N, Arslan M, Akçakın M. The adaptation and standardization of the Child Behaviour Checklist among 6-18 year old Turkish children. In: Sergeant J (ed). Eunethydis: European Approaches to Hyperkinetic Disorders. Zurich: Fotorotor Egg; 1995: 109-113.
19. Derogatis LR, Rickels K, Rock AF. The SCL-90 and the MMPI: a step in the validation of a new self-report scale. Br J Psychiatry 1976; 128: 280-289.
20. Dag I. Reliability and validity of Symptom Check List-90-Revised among university students. Turkish J Psych 1991; 2: 5-12.
21. Rosenberg M. Society and the Adolescent Self-Image. Princeton, New Jersey: Princeton University Press; 1965.
22. Çuhadaroğlu F. Adolesanlarda Benlik Saygısı (Self Image in Adolescents). Unpublished speciality thesis in psychiatry. Ankara, Turkey: Hacettepe University Department of Psychiatry; 1986.
23. Folkman S, Lazarus RS. An analysis of coping in a middle-aged community sample. J Health Soc Behav 1980; 21: 219-239.
24. Şahin NH, Durak A. Stresle Başa çıkma Tarzları Ölçeği: Üniversite öğrencileri için uyarlanması (Ways of Coping Inventory: Adaptation and Standardization for Collage Students). Türk Psikoloji Dergisi (Turk J Psychol) 1995; 10: 56-73.
25. Gleissner U, Fritz NE, Von Lehe M, Sassen R, Elger CE, Helmstaedter C. The validity of the Child Behavior Checklist for children with epilepsy. Epilepsy Behav 2008; 12: 276-280.
26. Rodenburg R, Meijer AM, Dekovi M, Aldenkamp AP. Family factors and psychopathology in children with epilepsy: a literature review. Epilepsy Behav 2005; 6: 488-503.
27. Aldenkamp AP, Bodde N. Behaviour, cognition and epilepsy. Acta Neurol Scand Suppl 2005; 182: 19-25.
28. Fisher RS, Vickrey BG, Gibson P, et al. The impact of epilepsy from the patient's perspective I. Descriptions and subjective perceptions. Epilepsy Res 2000; 41: 39-51.
29. Sourander A, Pihlakoski L, Aromaa M, Rautava P, Helenius H, Sillanpää M. Early predictors of parent- and self-reported perceived global psychological difficulties among adolescents: a prospective cohort study from age 3 to age 15. Soc Psychiatry Psychiatr Epidemiol 2006; 41: 173-182.
30. Matthews WS, Barabas G, Ferrari M. Emotional concomitants of childhood epilepsy. Epilepsia 1982; 23: 671-681.
31. Hoare P, Mann H. Self-esteem and behavioural adjustment in children with epilepsy and children with diabetes. J Psychosom Res 1994; 38: 859-869.
32. Ziegler RG. Impairments of control and competence in epileptic children and their families. Epilepsia 1981; 22: 339-346.
33. Jakovljević V, Martinović Z. Social competence of children and adolescents with epilepsy. Seizure 2006; 15: 528-532.
34. Carlson BE. A stress and coping approach to intervention with abused women. Family Relations 1997; 46: 291-299.
35. Hess RS, Richards ML. Developmental and gender influences on coping: implications for skills training. Psychology in the Schools 1999; 36: 149-157.
36. Oosterhuis A. Coping with epilepsy: the effect of coping styles on self-perceived seizure severity and psychological complaints. Seizure 1999; 8: 93-96.
37. Lee SA, Yoo HJ, Lee BI; Korean QoL in Epilepsy Study Group. Factors contributing to the stigma of epilepsy. Seizure 2005; 14: 157-163.
38. Livneh H, Wilson LM, Duchesneau A, Antonak RF. Psychosocial adaptation to epilepsy: the role of coping strategies. Epilepsy Behav 2001; 2: 533-544.
39. Baki O, Erdogan A, Kantarci O, Akisik G, Kayaalp L, Yalcinkaya C. Anxiety and depression in children with epilepsy and their mothers. Epilepsy Behav 2004; 5: 958-964.
40. Shore CP, Austin JK, Dunn DW. Maternal adaptation to a child's epilepsy. Epilepsy Behav 2004; 5: 557-568.
41. Adewuya AO. Parental psychopathology and self-rated quality of life in adolescents with epilepsy in Nigeria. Dev Med Child Neurol 2006a; 48: 600-603.
42. Adewuya AO, Oseni SB, Okeniyi JA. School performance of Nigerian adolescents with epilepsy. Epilepsia 2006b; 47: 415-420.
43. Vernberg EM, Silverman WK, La Greca AM, Prinstein MJ. Prediction of posttraumatic stress symptoms in children after hurricane Andrew. J Abnorm Psychol 1996; 105: 237-248.