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Attitudes Toward Rational Drug Use and Medication Self-management Among Parents of Children with Epilepsy

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Abstract

Background: Epileptic seizures are controlled with antiepileptic drugs (AEDs). The purpose of using AEDs is to prevent seizures by maintaining the effective dose of one or more AEDs. Using a medication according to its prescription involving dosage and dosing times is expressed as medication adherence.

Objectives: This study was performed to assess medication self-management and attitudes toward rational drug use among parents of children with epilepsy.

Methods: A descriptive and cross-sectional design was used in this study. The data were collected using a data collection form, the Parental Attitude Scale for Rational Drug Use (PASRDU), and the Turkish Pediatric Epilepsy Medication Self-management Questionnaire (PEMSQ-TR).

Results: The mean scores of participants (n = 192) on the PASRDU were 156.02 (standard deviation [SD] = 9.86), 133.02 (SD = 7.74), and 23 (SD = 7.58) on the total scale, accurate and conscious use subdimension, and effective and safe use subdimension, respectively. The mean scores of participants on the PEMSQ-TR were 81.38 (SD = 7.13), 42.4 (SD = 6.32), 24.3 (SD = 1.6), 11.36 (SD = 4.35), and 3.32 (SD = 1.94) on the total scale, information about epilepsy and treatment subdimension, adherence to treatment and clinic appointments subdimension, treatment-related obstacles subdimension, and treatment and social life subdimension, respectively. Parents' educational status ($F = 0.01$, $P < 0.05$), child's age at first seizure ($U = 0.026$, $P < 0.05$), frequency of seizure ($U = 0.043$, $P < 0.05$), age of the child ($\chi^2 = 0.002$, $P < 0.05$), and parents' age ($F = 0.036$, $P < 0.05$) had a significant effect on the total and subscale scores of the PASRDU and PEMSQ-TR.

Conclusions: This study showed that although parents of children with epilepsy had positive attitudes toward rational drug use, their epilepsy medication self-management was relatively poor. The improvement of the understanding of medication self-management can ultimately increase adherence, which will affect the clinical outcomes and quality of life in children with epilepsy.

Keywords: Epilepsy, Children, Self-management, Anticonvulsants

1. Background

According to the International Bureau for Epilepsy and the International League Against Epilepsy, epilepsy is a brain disorder characterized by a lasting propensity to induce epileptic seizures (1). Epileptic seizures are controlled with antiepileptic drugs (AEDs) (2). The purpose of using AEDs is to prevent seizures by maintaining the effective dose of one or more AEDs (2). The clinical uses and side effects of AEDs might differ in children compared to adults (3). Therefore, the dosage and dosing times should be strictly followed in using AEDs. Using a medication according to its prescription involving dosage and dosing times is expressed as medication adherence (4). A slight change in the use of AEDs reduces drug efficacy and increases the toxic effect (5, 6). For this reason, the rational use of AEDs is required to control epileptic seizures. Rational drug use is defined as the process of appropriate prescription and dispensation of drugs for the appropriate patient for the diagnosis, prevention, and treatment of diseases (7). Caregivers' knowledge about the rational use of AEDs and the right attitudes toward rational drug use facilitate managing and coping with the disease in childhood.

Medication noncompliance could be the result of

poor self-management (2). Self-management practices, particularly in adult patients with epilepsy, have shown encouraging outcomes; however, there are not enough data on AEDs self-management for children (8-10) that includes parental self-management, the use of AEDs, and attempts to control seizures in children with epilepsy (10). The rational use of AEDs, active participation of children with epilepsy and family members in the decision-making process with health professionals, appropriate seizure management, and effective coping practices show that parents are successful in epilepsy self-management (10-12).

2. Objectives

Although there are numerous studies on the AEDs self-management of parents who have children with epilepsy, there were no studies in which both the rational AEDs use and AEDs self-management of parents were determined. Therefore, this study aimed to determine the attitudes of parents who had children with epilepsy toward rational AEDs use and their AEDs self-management. In addition, this study aimed to support a more effective strategy to encourage AEDs self-management for children by determining the parental attitudes toward rational AEDs use and their self-management in epilepsy treatment.

3. Methods

3.1. Type of Research

This cross-sectional study was conducted on 192 parents with children who had epilepsy.

3.2. Setting/Sample

The power analysis revealed a power of 95% with an effect size of 0.24 at a significance level of 0.05 (2), indicating that a sample size of 179 subjects would be sufficient to detect significant differences in G*Power software (version 3.0). The current study involved 192 volunteering parents who visited a pediatric neurology outpatient department within November 2021 and February 2022.

The inclusion criteria included parents who had children with epilepsy and parents who volunteered to participate in the study. The exclusion criteria included parents with children who had undergone any surgery or followed a ketogenic diet.

3.3. Measurement Tools

The data were collected using a data collection form, the Parental Attitude Scale for Rational Drug Use (PASRDU), and the Turkish Pediatric Epilepsy Medication Self-management Questionnaire (PEMSQ-TR).

Data Collection Form: This form was created by the researcher following a literature review (8-11). The form comprised two parts, including the first 8 items focusing on the demographic characteristics of the children and the second part containing 6 items about the parents.

Parental Attitude Scale for Rational Drug Use (PASRDU): The scale was developed by Çelebi with 40 items in two subdimensions, namely accurate and conscious use (ACU) and effective and safe use (ESU) (13). Items on this 5-point Likert scale are scored as strongly disagree (1), disagree (2), undecided (3), agree (4), and strongly agree (5). The total scale score varies within the range of 40-200. As the score obtained from the scale increases, parents' positive attitudes toward rational drug use increase. Cronbach's alpha values were obtained as 0.88 and 0.83 for the original version (13) and this study, respectively.

Pediatric Epilepsy Medication Self-management Questionnaire (PEMSQ): The questionnaire was developed by Modi et al. (6). It consists of four subdimensions, namely information about epilepsy and treatment (IET), adherence to treatment and clinic appointments (ATCA), treatment-related obstacles (TRO), and treatment and social life (TSL), with a total of 27 items. In this study, the 21-item PEMSQ-TR was used (14). Items 1-15 on the scale are scored from totally disagree (1) to totally agree (5). Items 16 - 21 are evaluated from never (1) to always (5). The total scale score varies from 21 to 105. As the scores obtained from the scale increase, drug self-management skills increase. Cronbach's alpha values were obtained as 0.83, 0.70, and 0.78 for the original version (6), the PEMSQ-TR version (14), and this study, respectively.

3.4. Ethical and Legal Issues

The study protocol was approved by the the University of Health Sciences Gülhane Non-Invasive Research Ethics Committee (decision no.: 2021/246, date: May 6, 2021). Written consent was obtained from the participants who volunteered to participate in this study. The study was carried out following the principles of the Declaration of Helsinki.

3.5. Data Analysis

The data were analyzed by SPSS software (version 24.0; IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp., USA). Descriptive statistics were used to evaluate the sociodemographic data. The *t*-test and analysis of

variance (ANOVA) were used to analyze the variation of the scale scores according to demographic characteristics. The *t*-test was used to analyze demographic variables with two groups, and the ANOVA was used to analyze variables with k (k > 2) groups. However, non-parametric test techniques were used in data analysis since they did not show a normal distribution due to the kurtosis coefficient of the ATCA subdimension, which was not within the range of -3 to +3. The Mann-Whitney U and Kruskal-Wallis tests were used to analyze the scale scores' variation according to demographic characteristics. Although the Mann-Whitney test was used to analyze demographic variables with two groups, the Kruskal-Wallis test was used to analyze variables with k (k > 2) groups.

4. Results

Of the children with epilepsy, 100 (52.1%) and 123 (64.1%) subjects were aged < 6 and < 5 years, respectively (Table 1). Participants' mean scores on the PASRDU and PEMSQ-TR were 156.02 (standard deviation [SD] = 9.86) and 81.38 (SD = 7.13), respectively (Table 2).

The mean ACU score was higher in parents aged 31 - 40 years than in those younger than 30 years ($P < 0.05$). The mean ESU score was higher in those whose children had a seizure at the age of > 3 years than in those whose children had a seizure aged < 1 year ($P < 0.05$) (Table 3). The mean IET score was higher in parents whose children had a seizure frequency of once more than a year ($P < 0.05$) than in those whose children had a seizure frequency of several times a week ($P < 0.05$) and in parents whose children did not experience the side effects of AEDs than in those whose children experienced them. The mean ATCA score was higher in parents who were middle school graduates ($P < 0.05$) than in those who were elementary school graduates ($P < 0.05$) and in parents who had children aged 0-6 years than in those whose children were in the 13-18 age group. The mean TRO score was higher in parents who had children aged 0-6 years than in those whose children were in the 13-18 age group ($P < 0.05$), in parents whose children had a seizure aged < 1 year than in those whose children had a seizure aged > 3 years ($P < 0.05$), in parents whose children had a seizure within the last 48 hours than in those whose children had a seizure once more than a year ago ($P < 0.05$), and in parents whose children had several seizures in the last 24 hours than in those whose children had a seizure once more than a year ago ($P < 0.05$). The mean TRO score was higher in parents aged > 41 years than in those aged < 30 years ($P < 0.05$), in parents with children within the 13-18 age group than in those with children in the 0-6 age group ($P < 0.05$), and in parents whose children had seizures aged > 3 years than in those whose children had seizures before the age of 1 year ($P < 0.05$).

5. Discussion

This study was conducted to determine caregivers' epilepsy-related medication self-management and attitudes toward rational drug use. There are numerous studies in the literature on pediatric AEDs self-management of caregivers (10, 15); however, this is the first study on the evaluation of the attitudes toward rational drug use and pediatric AEDs self-management. The current study's findings are consistent with the findings of some studies (16, 17) on parents' attitudes toward rational drug use. The mean scores on the total PASRDU and its subscales in this study were higher than those of studies conducted by Çelebi and Kuloğlu (13, 18). This result shows that the caregivers are aware of the ESU of AEDs.

Some studies have shown higher PEMSQ scores (2, 10). The total PEMSQ score in this study was lower than in some studies (2, 10). Medication non-adherence to AEDs can result from poor self-management (2). This outcome demonstrates the need for support for caregivers in epilepsy medication self-management.

The age of the child with epilepsy and the parents is closely related to the rational use of AEDs (11, 19). The mean ACU score was higher in parents aged 31 - 40 years than in those younger than 30 years. Contrary to the results of the present study, Gabr and Shams (20) demonstrated that the age of parents with non-adherence was significantly higher than the age of those who were adherent. In this study, the mean ESU score was higher in parents whose children had a seizure aged > 3 years than in parents whose children had a seizure when they were younger than 1 year. Similarly, Lee et al. showed that the probability of adherence was significantly lower in parents who had toddlers than in those who had adolescent children (21). This result shows that the caregiver and the child with epilepsy develop effective coping mechanisms with increasing age.

Studies have shown that high-income levels increase parents' rational drug use (18, 22, 23). Studies by Modi et al. (10), Modi et al. (17), and Shaju et al. (9) showed that higher family socioeconomic status predicted higher adherence. Contrary to the results of the aforementioned studies, socioeconomic status was observed to affect parents' attitudes toward rational drug use in this study.

In a systematic review and meta-analysis (8), three studies (19, 20, 24) reported a correlation between the frequency of seizures and medication adherence. One of the studies showed a positive correlation between

Table 1. Distribution of Demographic Variables (n = 192)

Variables	Subcategories	No. (%)
Caregiver		
Caregiver	Mother	166 (86.5)
	Father	26 (13.5)
Age, y	< 30	42 (21.9)
	31 - 40	110 (57.3)
	> 41	40 (20.8)
Type of family	Nuclear family	172 (89.5)
	Extended family	12 (6.3)
	Single-parent family	8 (4.2)
Family income, mo	Income < expenses	55 (28.6)
	Income = expenses	110 (57.3)
	Income > expenses	27 (14)
Educational status	Elementary school	13 (6.8)
	Middle school	18 (9.4)
	High school	64 (33.3)
	University	97 (50.5)
Number of children	1	69 (35.9)
	2	77 (40.2)
	> 3	46 (23.9)
Child		
Age, y	< 6	100 (52.1)
	7 - 12	67 (34.9)
	13 - 18	25 (13)
Child's age at diagnosis, y	< 5	123 (64.1)
	6-10	55 (50.6)
	11-15	14 (7.3)
Child's age at first seizure, y	< 1	64 (33.3)
	2	62 (32.3)
	> 3	66 (34.4)
Last seizure	In the last 24 hours	62 (32.3)
	In the last 48 hours	12 (6.3)
	In the last week	20 (10.4)
	In the last month	22 (11.5)
	In the last 6 months	46 (23.9)
	In the last year	13 (6.8)
	In more than one year	17 (8.8)
Seizure frequency	Several times a day	79 (41.1)
	Several times a week	26 (13.6)
	Several times a month	36 (18.8)
	Several times a year	35 (18.2)
	In more than one year	16 (8.3)
Visiting hospital for follow-up and treatment of epilepsy regularly	Yes	189 (98.4)
	No	3 (1.6)
Side effects of AEDs	Yes	134 (69.8)
	No	58 (30.2)
Medication route for AEDs	Oral	156 (81.2)
	Nasogastric tube	12 (6.3)
	Gastrostomy tube	24 (12.5)

Abbreviation: AEDs, antiepileptic drugs.

Table 2. Distribution of Scale Scores (n = 192)

Scale	Possible Range		Mean ± SD
	Min.	Max.	
PASRDU			
Overall score	125.00	188.00	156.02 ± 9.86
Subscale scores			
ACU	106.00	145.00	133.02 ± 7.74
ESU	11.00	51.00	23.00 ± 7.58
PEMSQ-TR			
Overall score	62.00	105.00	81.38 ± 7.13
Subscale scores			
IET	16.00	50.00	42.40 ± 6.32
ATCA	17.00	25.00	24.30 ± 1.60
TRO	4.00	20.00	11.36 ± 4.35
TSL	2.00	10.00	3.32 ± 1.94

Abbreviations: PASRDU, Parental Attitude Scale for Rational Drug Use; ACU, accurate and conscious use; ESU, effective and safe use; PEMSQ-TR, Turkish Pediatric Epilepsy Medication Self-management Questionnaire; IET, information about epilepsy and treatment; ATCA, adherence to treatment and clinic appointments; TRO, treatment-related obstacles; TSL, treatment, and social life; Min, minimum; Max, maximum; SD, standard deviation.

previous seizure frequency and medication adherence (25); however, the correlation was not observed in the other two studies (15, 20).

In this study, the mean IET score was higher in parents whose children had a seizure frequency of more than one year than in those who stated that their children had seizures several times a week and in parents who stated that their children had no side effects of AEDs than in those whose children experienced the side effects of drugs. It was important for patients to take AEDs as prescribed since irregular treatment can lead to an increase in the number of seizures and improper treatment plan changes (24). Therefore, this finding in the current study is an important indicator in terms of showing that rational use of AEDs reduces the frequency of seizures.

Increasing parents' education level is a positive factor in epilepsy management. Accordingly, parents can have more information about epilepsy and the use of AEDs. Hirfanoglu et al. reported that maternal education was correlated with better knowledge of epilepsy and AEDs (24). Similarly, Tan reported significant correlations with parental educational levels in the domains of adherence to medications and clinic appointments (5).

The mean TRO score was higher in parents with children younger than 6 years of age than in those with children in the 13 - 18 age group, in parents whose children had a seizure younger than 1 year than in those whose children had a seizure when they were older than 3 years, and in parents whose children had a seizure in the last 48 hours than in those whose children had a seizure more than one year ago. Lee et al. indicated that adherence to AEDs was lower in caregivers who had toddlers than in those who had adolescents (21). Similarly, in this study, having a child with epilepsy at a younger age was an obstacle for parents to the rational use of AEDs and management of epilepsy treatment. This can be associated with the difficulty experienced by the parents of young children with epilepsy with using the AEDs administration route (i.e., nasogastric tube and gastrostomy tube) (14). Qualitative studies are needed to determine the difficulties experienced by parents with children in this age group in the management of AEDs. In addition, the support of health professionals for this group will strengthen parents in the self-management of AEDs.

The mean TSL score was higher in parents who were aged > 41 years than in those younger than 30 years, in parents with children aged 13-18 years than in those with children younger than 6 years of age, and in parents whose children had a seizure after 3 years of age than in those whose children had a seizure before 1 year of age. However, Gabr and Shams reported that maternal age was significantly higher in non-adherent patients than in adherent ones (20). The current study's findings showed that parents who were younger and had a child with epilepsy at a young age had more difficulties in social life than parents of older children.

This study has two limitations. Firstly, since 86.5% (n = 166) of the study sample consisted of mothers, the scale

Table 3. Comparison of Parental Attitude Scale for Rational Drug Use According to Child and Parent Variables

Variables	PASTRDU			PEMSQ-TR				
	ACU	ESU	Total	IET	ATCA	TRO	TSL	Total
Caregiver Variables								
Caregiver								
Mother	133.01 ± 7.84	23.3 ± 7.45	156.31 ± 9.53	42.44 ± 6.35	24.39 ± 1.45	11.14 ± 4.23	3.42 ± 2.01	81.38 ± 7.07
Father	133 ± 7.29	21.27 ± 8.51	154.27 ± 12.05	41.65 ± 6.2	23.73 ± 2.31	12.5 ± 4.98	2.85 ± 1.41	80.73 ± 7.51
Test	0.964 [a]	0.18 [a]	0.237 [a]	0.69 [a]	0.466 [b]	0.235 [a]	0.115 [a]	0.816 [a]
Age, y								
< 30	132.39 ± 7.01	22.63 ± 7.1	155.02 ± 6.16	40.02 ± 5.53	24.02 ± 1.88	12.54 ± 4.49	2.95 ± 1.66	79.54 ± 6.2
31 - 40	133.34 ± 7.16	23.45 ± 7.77	156.78 ± 9.93	43.47 ± 5.6	24.46 ± 1.41	11.22 ± 4.1	3.26 ± 1.88	82.42 ± 6.99
> 41	132.18 ± 9.74	22.1 ± 6.95	154.28 ± 11.68	41.54 ± 8.22	24.08 ± 1.81	10.72 ± 4.69	4.03 ± 2.29	80.36 ± 8.22
Test	0.664 [b]	0.501 [b]	0.312 [b]	0.008 [b, c]	0.354 [d]	0.137 [b]	0.036 [b, c]	0.054 [b]
Educational status								
Primary school	131.15 ± 11.98	24.08 ± 10.94	155.23 ± 18.64	45 ± 4.62	23.77 ± 1.88	11 ± 5.76	4.31 ± 3.04	84.08 ± 9.91
Secondary school	134.89 ± 6.34	23.89 ± 5.44	158.78 ± 6.54	43.5 ± 7.46	24.61 ± 1.14	11.39 ± 5.03	2.94 ± 1.51	82.44 ± 7.11
High school	131.72 ± 8.11	22.19 ± 7.35	153.91 ± 10.29	40.89 ± 7.08	23.92 ± 1.87	12.03 ± 3.72	3.31 ± 1.87	80.16 ± 7.35
University	133.78 ± 6.97	23.32 ± 7.63	157.1 ± 8.3	42.81 ± 5.6	24.56 ± 1.38	10.97 ± 4.43	3.3 ± 1.87	81.64 ± 6.48
Test	0.172 [b]	0.558 [b]	0.135 [b]	0.077 [b]	0.01 [c, d]	0.499 [b]	0.26 [b]	0.233 [b]
Child Variables								
Age, y								
< 6	132.72 ± 7.52	24.07 ± 7.65	156.79 ± 8.56	41.77 ± 6.3	24.56 ± 1.33	11.83 ± 4.18	2.98 ± 1.61	81.15 ± 6.61
7 - 12	132.52 ± 8.56	22.58 ± 7.42	155.1 ± 11.43	42.22 ± 6.2	23.82 ± 1.93	11.42 ± 4.12	3.61 ± 1.98	81.07 ± 7.67
13 - 18	135.8 ± 5.86	19.84 ± 7.1	155.64 ± 10.51	45.12 ± 6.21	24.52 ± 1.36	9.2 ± 5.14	4 ± 2.71	82.84 ± 7.75
Test	0.316 [b]	0.127 [b]	0.544 [b]	0.058 [b]	0.002 [c, d]	0.025 [b, c]	0.021 [b, c]	0.532 [b]
Child's age at first seizure, y								
< 1	131.48 ± 7.14	25.69 ± 6.96	157.17 ± 8.89	41.23 ± 6.04	24.45 ± 1.3	12.23 ± 3.91	2.94 ± 1.53	80.86 ± 6.96
1 - 2	134.45 ± 7.82	22.66 ± 7.87	157.11 ± 9.4	43.45 ± 5.81	24.35 ± 1.71	11.63 ± 4.32	3.21 ± 2.03	82.65 ± 7.19
> 3	133.25 ± 8.07	20.76 ± 7.22	154.01 ± 10.96	42.43 ± 6.9	24.1 ± 1.75	10.24 ± 4.61	3.82 ± 2.12	80.6 ± 7.18
Test	0.113 [b]	0.003 [b, c]	0.111 [b]	0.143 [b]	0.347 [d]	0.026 [b, c]	0.027 [b, c]	0.214 [b]
Last seizure								
In the last 24 hours	132.5 ± 7.69	24.79 ± 7.7	157.29 ± 7.91	41.45 ± 5.77	24.48 ± 1.2	12.61 ± 4.21	3.5 ± 1.96	82.05 ± 6.95
In the last 48 hours	132 ± 6.07	23.8 ± 6.81	155.8 ± 7.32	41.6 ± 5.72	24.4 ± 1.58	14 ± 3.59	2.7 ± 1.34	82.7 ± 6.99
In the last week	132.72 ± 8.28	21.17 ± 6.32	153.89 ± 9.9	38.67 ± 9	24.06 ± 1.47	11.28 ± 4.62	3.44 ± 2.2	77.44 ± 7.79
In the last month	133.45 ± 7.8	22.1 ± 6.68	155.55 ± 10.67	43.05 ± 4.89	24.4 ± 1.39	11.75 ± 3.99	2.8 ± 1.51	82 ± 5.12
In the last 6 months	133.07 ± 8.84	22.15 ± 8.33	155.22 ± 11.61	43.63 ± 6.11	24.13 ± 1.93	10.3 ± 3.89	3.48 ± 2.04	81.54 ± 7.5
In the last year	135.18 ± 4.33	21.73 ± 7.48	156.91 ± 7.46	41.82 ± 8.1	23.82 ± 2.71	11.55 ± 5.79	2.91 ± 1.64	80.09 ± 8.17
In more than one year	135.41 ± 4.86	25 ± 7.92	160.41 ± 10.4	45.35 ± 4.61	24.82 ± 0.53	8.47 ± 3.95	3.53 ± 2.37	82.18 ± 7.43
Test	0.906 [b]	0.401 [b]	0.472 [b]	0.034 [b, c]	0.681 [d]	0.003 [b, c]	0.681 [b]	0.316 [b]
Seizure frequency								
Several times a day	132.13 ± 7.06	24.33 ± 7.24	156.46 ± 8.72	40.61 ± 6.76	24.33 ± 1.47	13.06 ± 4.16	3.59 ± 2.15	81.59 ± 7.99
Several times a week	136.56 ± 4.8	20.67 ± 6.32	157.22 ± 5.43	40 ± 6.71	24.44 ± 1.67	10.56 ± 4.1	2.67 ± 1.12	77.67 ± 7.12
Several times a month	133.84 ± 6.7	22.42 ± 7.14	156.26 ± 10.39	43.74 ± 4.84	24.42 ± 1.54	10.71 ± 4.28	3.32 ± 2.2	82.19 ± 5.55
Several times a year	132.9 ± 10.09	24.4 ± 10.02	157.3 ± 13.98	42.63 ± 7.02	23.93 ± 1.96	10.43 ± 4.17	3.3 ± 1.74	80.3 ± 7.57
In more than one year	136.86 ± 5.15	20.57 ± 5.09	157.43 ± 4.89	46.14 ± 3.44	24.43 ± 0.79	8.57 ± 3.64	3.14 ± 1.68	82.29 ± 4.79
Test	0.205 [b]	0.456 [b]	0.991 [b]	0.043 [b, c]	0.717 [d]	0.002 [b, c]	0.71 [b]	0.483 [b]
Side effects of AEDs								
Yes	132.27 ± 7.76	23.03 ± 7.12	155.3 ± 9.55	41.81 ± 6.5	24.3 ± 1.58	11.94 ± 4.12	3.41 ± 1.99	81.46 ± 7.25
No	134.84 ± 7.51	23.16 ± 8.65	158 ± 10.58	43.82 ± 5.65	24.39 ± 1.51	9.98 ± 4.61	3.14 ± 1.84	81.33 ± 6.89
Test	0.075 [a]	0. 673 [b]	0.085 [a]	0.044 [a, c]	0.717 [b]	0.004 [a, c]	0.381 [a]	0.909 [a]

Abbreviations: PASTRDU, Parental Attitude Scale for Rational Drug Use; ACU, accurate and conscious use; ESU, effective and safe use; PEMSQ-TR, Turkish Pediatric Epilepsy Medication Self-management Questionnaire; IET, information about epilepsy and treatment; ATCA, adherence to treatment and clinic appointments; TRO, treatment-related obstacles; TSL, treatment and social life; AEDs, antiepileptic drugs.

[a] *t*-test.

[b] Mann-Whitney U test.

[c] $P < 0.05$.

[d] Kruskal-Wallis test.

scores of the mothers and fathers could not be compared. Secondly, although having a child with epilepsy at an early age was identified as a barrier to the rational use of AEDs and management of epilepsy treatment for parents, the reason for this barrier could not be investigated. Qualitative studies are needed to determine the difficulties experienced by parents of children in this age group in the management of AEDs. Although there are limitations in this study, this is the first study on the evaluation of the attitudes toward rational drug use and pediatric AEDs self-management of parents.

5.1. Conclusions

This study showed that although the parents of children with epilepsy had positive attitudes toward rational drug use, their epilepsy medication self-management was relatively poor. The improvement of the understanding of medication self-management can ultimately increase adherence, which will affect the clinical outcomes and quality of life in children with epilepsy. For this reason, clinicians should provide adequate education for the parents of children with epilepsy. Moreover, it is required to search for reasons why epilepsy medication self-management is relatively poor, although parents have positive attitudes toward rational drug use. Therefore, it is suggested to carry out qualitative studies on this topic.

Footnotes

Authors' Contribution: Study concept and design: D.S. and K.K.; Analysis and interpretation of the data: D.S. and D.Y.; Drafting of the manuscript: D.S. and K.K.; Critical revision of the manuscript for important intellectual content: D.S., K.K., D.Y., and B.U.; Statistical analysis: D.S. and K.K.

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Ethical Approval: The study protocol was approved by the the University of Health Sciences Gülhane Non-Invasive Research Ethics Committee (decision no.: 2021/246, date: May 6, 2021). Written consent was obtained from the participants who volunteered to participate in this study. The study was carried out following the principles of the Declaration of Helsinki.

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References

1. Fisher RS, van Emde Boas W, Blume W, Elger C, Genton P, Lee P, et al. Epileptic seizures and epilepsy: definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE). *Epilepsia*. 2005;**46**(4):470–2. [PubMed ID: 15816939]. https://doi.org/10.1111/j.0013-9580.2005.66104.x.
2. Tan JW, Khoo TB, Burharudin NF, Mohamed Shah N. Medication self-management among parents of children with epilepsy at a tertiary care center in Malaysia. *Epilepsy Behav*. 2020;**111**:107317. [PubMed ID: 32693382]. https://doi.org/10.1016/j.yebeh.2020.107317.
3. French JA, Staley BA. AED Treatment Through Different Ages: As Our Brains Change, Should Our Drug Choices Also? *Epilepsy Curr*. 2012;**12**(Suppl 3):22–7. [PubMed ID: 23476119]. [PubMed Central ID: PMC3588149]. https://doi.org/10.5698/1535-7511-12.4s.22.
4. Cramer JA, Roy A, Burrell A, Fairchild CJ, Fuldeore MJ, Ollendorf DA, et al. Medication compliance and persistence: terminology and definitions. *Value Health*. 2008;**11**(1):44–7. [PubMed ID: 18237359]. https://doi.org/10.1111/j.1524-4733.2007.00213.x.
5. Guekht A, Brodie M, Secco M, Li S, Volkers N, Wiebe S. The road to a World Health Organization global action plan on epilepsy and other neurological disorders. *Epilepsia*. 2021;**62**(5):1057–63. [PubMed ID: 33675058]. https://doi.org/10.1111/epi.16856.
6. Modi AC, Monahan S, Daniels D, Glauser TA. Development and validation of the Pediatric Epilepsy Medication Self-Management Questionnaire. *Epilepsy Behav*. 2010;**18**(1-2):94–9. [PubMed ID: 20452831]. [PubMed Central ID: PMC2904867]. https://doi.org/10.1016/j.yebeh.2010.03.009.
7. *Promoting rational use of medicines: core components*. World Health Organization; 2002, [cited 6/20/2022]. Available from: https://apps.who.int/iris/handle/10665/67438.
8. Yang C, Hao Z, Yu D, Xu Q, Zhang L. The prevalence rates of medication adherence and factors influencing adherence to antiepileptic drugs in children with epilepsy: A systematic review and meta analysis. *Epilepsy Res*. 2018;**142**:88–99. [PubMed ID: 29609075]. https://doi.org/10.1016/j.eplepsyres.2018.03.018.
9. Shaju M, Vinayan K, Abraham S. Knowledge, attitude and practice of parents regarding pediatric antiepileptic drug therapy. *Int J Epilepsy*. 2018;**1**(2):57–63. https://doi.org/10.1016/j.ijep.2014.11.002.
10. Modi AC, Rausch JR, Glauser TA. Patterns of nonadherence to antiepileptic drug therapy in children with newly diagnosed epilepsy. *JAMA*. 2011;**305**(16):1669–76. [PubMed ID: 21521848]. [PubMed Central ID: PMC3480079]. https://doi.org/10.1001/jama.2011.506.
11. Edward KL, Cook M, Giandinoto JA. An integrative review of the benefits of self-management interventions for adults with epilepsy. *Epilepsy Behav*. 2015;**45**:195–204. [PubMed ID: 25843342]. https://doi.org/10.1016/j.yebeh.2015.01.026.
12. Smith AW, Mara CA, Modi AC. Adherence to antiepileptic drugs in adolescents with epilepsy. *Epilepsy Behav*. 2018;**80**:307–11. [PubMed ID: 29429909]. https://doi.org/10.1016/j.yebeh.2017.12.013.
13. Sarialioğlu A, Çelebioğlu A. Development of a Parental Attitude Scale for Rational Drug Use. *Clin Exp Health Sci*. 2022;**12**(2):352–9. https://doi.org/10.33808/clinexphealthsci.862272.

14. Tutar Ş, İşler Dalgıç A. Psycholinguistic and Psychometric Measurements of the Turkish Pediatric Epilepsy Medication Selfmanagement Questionnaire. *J Pediatr Res*. 2021;**8**(2):145–55. https://doi.org/10.4274/jpr.galenos.2020.87587.
15. Ramsey RR, Zhang N, Modi AC. The Stability and Influence of Barriers to Medication Adherence on Seizure Outcomes and Adherence in Children With Epilepsy Over 2 Years. *J Pediatr Psychol*. 2018;**43**(2):122–32. [PubMed ID: 29049791]. [PubMed Central ID: PMC5896586]. https://doi.org/10.1093/jpepsy/jsx090.
16. Modi AC, Morita DA, Glauser TA. One-month adherence in children with new-onset epilepsy: white-coat compliance does not occur. *Pediatrics*. 2008;**121**(4):e961–6. [PubMed ID: 18316355]. https://doi.org/10.1542/peds.2007-1690.
17. Modi AC, Guilfoyle SM, Morita DA, Glauser TA. Development and reliability of a correction factor for parent-reported adherence to pediatric antiepileptic drug therapy. *Epilepsia*. 2011;**52**(2):370–6. [PubMed ID: 21087247]. [PubMed Central ID: PMC3058802]. https://doi.org/10.1111/j.1528-1167.2010.02789.x.
18. Kuloglu Ç, EkİCİ E. [Examination of Parents' Rational Drug Use Attitudes]. *Turk J Pediatr Dis*. 2021:107–16. Turkish. https://doi.org/10.12956/tchd.860536.
19. Kyngas H. Compliance with health regimens of adolescents with epilepsy. *Seizure*. 2000;**9**(8):598–604. [PubMed ID: 11162760]. https://doi.org/10.1053/seiz.2000.0470.
20. Gabr WM, Shams ME. Adherence to medication among outpatient adolescents with epilepsy. *Saudi Pharm J*. 2015;**23**(1):33–40. [PubMed ID: 25685041]. [PubMed Central ID: PMC4311017]. https://doi.org/10.1016/j.jsps.2014.05.003.
21. Lee HJ, Choi EK, Kim HS, Kang HC. Medication self-management and the quality of discharge education among parents of children with epilepsy. *Epilepsy Behav*. 2019;**94**:14–9. [PubMed ID: 30884402]. https://doi.org/10.1016/j.yebeh.2018.12.030.
22. Yu M, Zhao G, Stalsby Lundborg C, Zhu Y, Zhao Q, Xu B. Knowledge, attitudes, and practices of parents in rural China on the use of antibiotics in children: a cross-sectional study. *BMC Infect Dis*. 2014;**14**:112. [PubMed ID: 24576064]. [PubMed Central ID: PMC3938908]. https://doi.org/10.1186/1471-2334-14-112.
23. Shah NM, Hawwa AF, Millership JS, Collier PS, Ho P, Tan ML, et al. Adherence to antiepileptic medicines in children: a multiple-methods assessment involving dried blood spot sampling. *Epilepsia*. 2013;**54**(6):1020–7. [PubMed ID: 23448146]. https://doi.org/10.1111/epi.12126.
24. Hirfanoglu T, Serdaroglu A, Cansu A, Soysal AS, Derle E, Gucuyener K. Do knowledge of, perception of, and attitudes toward epilepsy affect the quality of life of Turkish children with epilepsy and their parents? *Epilepsy Behav*. 2009;**14**(1):71–7. [PubMed ID: 18778793]. https://doi.org/10.1016/j.yebeh.2008.08.011.
25. Hazzard A, Hutchinson SJ, Krawiecki N. Factors related to adherence to medication regimens in pediatric seizure patients. *J Pediatr Psychol*. 1990;**15**(4):543–55. [PubMed ID: 2124261]. https://doi.org/10.1093/jpepsy/15.4.543.