

Turkish Validity and Reliability Study of the ECT Perception and Knowledge Scale

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ABSTRACT

Introduction: Electroconvulsive Therapy (ECT) is an effective and safe treatment method used in the treatment of various psychiatric diseases. However, negative attitudes associated with ECT are common. This causes many negative consequences, from the treatment preference to treatment response and stigma. In this study, we aimed to carry out a validity-reliability analysis of the ECT Perception and Knowledge Scale (ECT-PK), which was developed to determine the perception and knowledge levels related to ECT, and adapt it to Turkish.

Method: The Turkish adaptation of the ECT-PK was made using the translation-retranslation method. Our study included 50 patients with schizophrenia, 50 patients with bipolar disorder, 50 patients with major depression who met the remission criteria determined separately for each disorder, and 150 healthy controls. To measure test-retest reliability, the scale was re-applied to 30 patients randomly selected from the patient group 14–21 days after the first application of the scale.

Results: In our study, a significant difference was found in both the patient and control groups in terms of the history of ECT application in the past and the status of accepting ECT application when recommended, and the perception and knowledge subscales of the ECT-PK. These results support the construct and criterion validity of the ECT-PK. Cronbach's alpha coefficient was found to be 0.85 for the perception subscale and 0.78 for the knowledge subscale. The intra-class correlation coefficient used to evaluate the test-retest reliability was 0.86 for the perception scale and 0.83 for the knowledge subscale.

Conclusion: It has been shown that the ECT-PK is a valid and reliable measurement tool that can be used to measure the perception and knowledge levels related to ECT in both clinical and non-clinical groups.

Keywords: ECT-PK scale, validity, reliability

Cite this article as: Yıldırım YE, Çetin Aydın P, Öztürk N. Turkish Validity and Reliability Study of the ECT Perception and Knowledge Scale. Arch Neuropsychiatry 2023;60:55–61.

INTRODUCTION

Electroconvulsive therapy (ECT) has been used for many years in the treatment of various mental disorders, however, it continues to be one of the most controversial treatment methods in psychiatry. Electroconvulsive therapy is one of the first biological treatment methods of psychiatry and its mechanism of action is still unknown, but its application is based on the induction of typical grand mal epileptic seizures in the brain through external electrical stimulation (1). In the first period of ECT's implementation, treatment standards were not determined, complications were common, and it was presented as a punishment tool in the media, so negative perceptions related to the treatment became widespread (2). In the following years, the updating of ECT application technique with increasing scientific knowledge and technological advancements and the standardization of administration of anesthesia led to the modification of the treatment. Since modified ECT became a routine procedure, many ECT-related side effects, especially cognitive dysfunction, have decreased, and it has been shown that the incidence of serious side effects is not higher than other treatment options (3). Today, although it is quite modern and its reliability has been proven many times, the limited use of ECT seems to be related to the persistence of negative perceptions about ECT (4). The fact that ECT is the most stigmatized treatment among psychiatric treatments prevents

Highlights

- Due to negative attitudes towards Electroconvulsive therapy (ECT), it is underutilized.
- The ECT-PK was developed to measure the level of perception and knowledge about ECT.
- Both perception and knowledge subscales of the ECT-PK are highly reliable.
- The ECT-PK is valid and reliable in clinical and non-clinical groups.

adequate utilization of this treatment (5). For this reason, studies related to ECT have begun to investigate not only the effectiveness of treatment or side effects, but also attitudes towards ECT.

The prevalence and indications of ECT vary significantly between countries and even between regions of the same country. For example, it has been shown that while ECT is mostly used in older women with depression in western countries, it is applied in younger men with schizophrenia

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Received: 02.03.2022, **Accepted:** 11.06.2022, **Available Online Date:** 26.02.2023

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in Asian countries (6). In order to investigate the underlying causes of these regional variations, it is necessary to develop culture-specific measurement tools.

The seminal studies on attitudes towards ECT have continued increasingly since 1980 (7) but the lack of standardized measurement tools in the studies has contributed to the emergence of conflicting results in these researches (8). It was emphasized that the absence of a standardized measurement tool created a great deficiency in the recent review of studies on the level of perception and knowledge about ECT in the general population, patients, and healthcare professionals (9).

When the studies on knowledge and attitudes towards ECT in our country were reviewed, it was seen that six different studies were conducted with medical and psychology students (10,11), child and adolescent psychiatrists (12), resident physicians (13), and patients with bipolar disorder and their relatives (14,15). In these studies, non-standardized measurement tools were used to measure knowledge and attitudes about ECT, except for the study of Çelik et al. (11). In the mentioned study, the validity and reliability analysis of the 37-question scale developed by the researchers, including 21 questions about knowledge level and 16 questions about attitudes were included.

The ECT Perception and Knowledge Scale (ECT-PK) was developed by Tsai et al. as a standardized measurement tool to measure knowledge and perception of ECT (16). ECT-PK consists of 18 items in total. The scale development study was conducted with 1091 patients who scored eight or more in the Patient Health Questionnaire, which was determined as the cut-off point for depression screening. As a result, it was found that both perception and knowledge subscales of ECT-PK demonstrated good validity and reliability.

In our country, determining the perception and knowledge of ECT in different groups such as patients, their relatives and mental health professionals is a necessity in terms of guiding mental health professionals working in this field. In addition to the fact that stigmatization in severe mental illnesses is a problem in itself, the existence of a scale that can be used to detect negative attitudes related to ECT will enable the identification of attitudes towards ECT. The scale will have a significant contribution both in identifying and eliminating incorrect and incomplete information and in reducing stigma. In our study, we aimed to conduct validity and reliability analyses of the Turkish version of the ECT-PK Scale in order to determine the perception and knowledge related to ECT.

METHODS

Subjects and Study Design

Our study included 50 patients diagnosed with bipolar disorder, 50 patients diagnosed with schizophrenia and 50 patients diagnosed with major depression according to the DSM-5 diagnostic criteria. The patients were chosen from individuals who met the remission criteria determined separately according to the disease groups and who applied to Bakırköy Prof. Dr. Mazhar Osman Mental Health and Neurological Diseases Training and Research Hospital outpatient clinics and Bakırköy Community Mental Health Center between October 2020 - June 2021. The study also included 150 healthy people without any psychiatric disorders. All participants were over the age of 18. The remission criteria were defined as having a score of five or lower on the Young Mania Rating Scale and a score of seven or lower on the Hamilton Depression Rating Scale (17) for bipolar disorder, a score of 60 or less on the Positive and Negative Syndrome Scale for schizophrenia (18), and a score of 7 or lower on the Hamilton Depression Rating Scale for major depression (19). Patients who had not been hospitalized in the last six months and

who were determined to be in remission by the researcher who made the clinical evaluation were included in the study.

The diagnoses of the participants were determined on the basis of clinical interviews made according to DSM-5, outpatient clinic records, and medical records related to hospitalization if there was a history of inpatient treatment. The criteria for inclusion in the control group were determined as being between the ages of 18-65, not having a previous psychiatric admission, and not being a healthcare worker. Relatives of hospital staff and non-first degree relatives of patients who met the inclusion criteria and volunteered to participate in the study were included in the control group. Written consent of all participants was obtained and illiterate patients were not included. For test-retest reliability, ECT-PK was applied over the phone to 30 participants randomly selected from the patient group 14-21 days after the first tests were administered. Ethics committee approval of our research was obtained from Istanbul Bakırköy Dr. Sadi Konuk Training and Research Hospital Clinical Research Ethics Committee on 21.09.2020 with the decision number 2020-19-17.

The institution where our study was conducted is located in Istanbul, the most densely populated city in Turkey, and is a tertiary training and research hospital as the country's largest psychiatric hospital (20). A study in which the admissions to our hospital between July 2006 and July 2007 and ECT administration were reviewed, reported that ECT was administered to a total of 1531 patients during one year, and 12.4% of all inpatients were treated with ECT. It has been reported that 30.3% of the patients who received ECT were diagnosed with bipolar disorder manic episode, 29.5% with schizophrenia, and 15.2% with unipolar or bipolar depression (21). While ECT without anesthesia was widely used in Turkey until 2005, modified ECT with anesthesia has become the standard with the ECT administration regulation published by the Ministry of Health in 2006 (15). Among the 73 patients who participated in our study, 70 of the 73 patients who had received ECT in the past were administered ECT in the hospital where the study was conducted, two patients were administered ECT in another health institution, and one patient was administered both in our hospital and in another healthcare institution.

The Translation Process

The Turkish adaptation of the scale was carried out by following the stages of translation, synthesis of translations and semantic editing, back translation, expert committee assessment, and pilot application as suggested by the intercultural scale adaptation guidelines (22,23). For the validity-reliability study in Turkish, permission was obtained from J. Tsai, the developer of the ECT-PK, via electronic mail. In the adaptation process of the scale, the translation from English to Turkish was carried out by three researchers. These translations were edited by the researchers, and the end result was translated back into English by a native English speaker working at the Faculty of Foreign Languages, who speaks both languages (Turkish-English). After comparing the translation with the original English version, the Turkish translation was revised. Opinions about the cultural relevance of the scale were obtained from three psychiatrists who knew both languages and the content of the scale was evaluated. After the arrangements made, 20 people who were not included in the study were included in the pilot application, and the individuals were asked to evaluate the scale in terms of items they had difficulty in understanding, readability and item format, and the scale was finalized after the suggested changes.

Assessment Tools

Sociodemographic Questionnaire: It is an interview form that was created by the researchers of the study to determine the sociodemographic characteristics of the participants, and includes detailed questions about age, educational status, occupation, marital status, history of disease, and clinical variables.

ECT Perception and Knowledge Scale (ECT-PK): It was developed by Tsai et al. to measure knowledge and attitudes about ECT. It consists of 18 items in total (16). The subscale for perceptions about ECT contains six items in a five-point Likert type, scored between 1 (strongly disagree) and 5 (strongly agree), and the subscale for knowledge about ECT includes 12 items in the form of yes-no questions. Higher perception and knowledge subscale scores reflect more positive perception and higher knowledge levels. In the scale development study, Cronbach's alpha coefficients were calculated as 0.79 for the perception subscale and 0.61 for the knowledge subscale.

Hamilton Depression Rating Scale (HAM-D): It is a clinician-administered scale developed by Hamilton to evaluate the severity of depression in patients diagnosed with depression (24). There are subgroups such as depressive mood, suicide, retardation, agitation, gastrointestinal symptoms, general somatic symptoms, hypochondriasis, insight, appetite, loss of weight, insomnia, and anxiety. Turkish validity and reliability study was performed by Akdemir et al. (25).

Young Mania Rating Scale (YMRS): The scale developed by Young et al. (26) is used to measure the severity of a manic episode. Seven items of the 11-item scale are in the five-point Likert type, and the other four items are in the nine-point Likert type. The validity and reliability of the Turkish version has been demonstrated (27).

Positive and Negative Syndrome Scale (PANSS): It was developed by Kay et al. to evaluate the positive and negative symptoms and the general psychopathology of schizophrenia and to measure the level of these symptoms (28). It consists of a total of 30 items and three subscales. Turkish validity and reliability study was conducted by Kostakoğlu et al. (29).

Statistical Analysis

The SPSS (Statistical Package for Social Sciences) for Windows version 26.0 was used for the statistical analysis of the findings obtained in the study. Descriptive statistics were given as mean, standard deviation, frequency, and percentage. The Kolmogorov-Smirnov test was used to determine the conformity of the variables to the normal distribution.

After descriptive analyses, independent sample t-test and one-way analysis of variance were applied for the variables that fit the normal distribution. Pearson correlation analysis was used for the correlation of normally distributed variables. Reliability and internal consistency were evaluated using Cronbach's alpha reliability test. Test-retest reliability was calculated with intraclass correlation coefficient and two-way mixed-effects model. Significance was set at the $p < 0.05$ level.

RESULTS

Descriptive Statistics

The ages of the participants included in our study ranged between 18–62 years. The mean duration of illness in the patient group was 14.1 ± 9.2 years. It was seen that 73 (48.7%) of the patients had received ECT in the past, and 77 (51.3%) had not received ECT. It was determined that 51 of the patients who underwent ECT were administered ECT with anesthesia, eight without anesthesia, and 14 with both anesthesia and without anesthesia, and there was no statistically significant difference between the perception levels and the application technique related to ECT. Detailed sociodemographic and clinical descriptive characteristics of the patient and control groups are presented in Table 1.

Validity Analysis

The construct validity of the ECT-PK was evaluated by comparing the perception and knowledge subscale scores of the ECT-PK according to the patient group's history of ECT, and the correlation between the two subscales of the ECT-PK, as in the original development study of the scale.

It was determined that patients who received ECT in all three diagnostic groups had a more positive perception in the perception subscale of the ECT-PK compared to patients who did not receive ECT. It was found that in patients with schizophrenia, those who received ECT had a higher level of knowledge in the knowledge subscale of the ECT-PK than those who did not receive ECT. There was no statistically significant difference in terms of knowledge levels between those who did and did not receive ECT in patients with bipolar disorder and major depression. When the

Table 1. Sociodemographic and clinical characteristics of the participants

		Schizophrenia (n: 50)	Bipolar Disorder (n: 50)	Major Depressive Disorder (n: 50)	Healthy Control (n: 150)	Total (N: 300)
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age		38.3±11.2	42.7±10.0	43.0±12.0	46.7±13.4	44.0±12.6
Education (years)		9.4±3.7	10.2±3.7	9.7±3.9	8.6±3.9	9.2±3.9
Duration of Illness (years)		14.7±9.4	14.9±8.6	12.0±9.5	-	-
		n (%)	n (%)	n (%)	n (%)	n (%)
Gender	Female	14 (28)	30 (60)	31 (62)	74 (49.3)	149 (49.7)
Marital Status	Married	8 (16)	28 (56)	24 (48)	70 (46.7)	130 (43.3)
	Single	36 (72)	14 (28)	23 (46)	62 (41.3)	135 (45.0)
	Divorced/widowed	6 (12)	8 (16)	3 (6)	18 (12.0)	35 (11.7)
Employment	Unemployed	29 (58)	32 (64)	25 (50)	77 (51.4)	163 (54.3)
	Employed	9 (18)	14 (28)	17 (34)	38 (25.3)	78 (26.0)
	Retired	12 (24)	4 (8)	8 (16)	35 (23.3)	59 (19.7)
History of ECT	Yes	25 (50)	33 (66)	15 (30)	0 (0)	77 (25.7)

ECT: Electroconvulsive Therapy; SD: Standard Deviation

Table 2. Comparison of ECT-PK scores according to history of ECT in patient group

		n	ECT-PK Perception		ECT-PK Knowledge	
			Mean ± SD	t, p	Mean ± SD	t, p
Schizophrenia	ECT	25	3.42±0.82	t=3.50 p=0.001	8.56±2.69	t=3.50 p=0.001
	No ECT	25	2.71±0.58		5.76±2.94	
Bipolar Disorder	ECT	33	3.38±0.84	t=2.63 p=0.012	7.45±2.42	t=1.43 p=0.158
	No ECT	17	2.79±0.70		6.35±2.84	
Major Depressive Disorder	ECT	15	3.75±0.87	t=2.05 p=0.045	8.73±2.78	t=0.99 p=0.325
	No ECT	35	3.26±0.72		7.83±3.01	
Total	ECT	73	3.74±0.84	t=3.85 p<0.001	8.10±2.62	t=2.70 p=0.008
	No ECT	77	2.98±0.71		6.83±3.06	

ECT: Electroconvulsive Therapy; ECT-PK: Electroconvulsive Therapy Perception and Knowledge Scale; SD: Standard Deviation; t: Independent samples t-test

Table 3. Comparison of the Perception and Knowledge subscale scores of the ECT-PK according to willingness to try ECT

	Willingness to try ECT	n	ECT-PK Perception		ECT-PK Knowledge	
			Mean ± SD	t, p	Mean ± SD	t, p
Patients	Yes	89	3.68±0.63	t=11.67 p<0.001	8.88±2.21	t=8.96 p<0.001
	No	61	2.54±0.51		5.36±2.56	
Controls	Yes	82	3.71±0.62	t=13.91 p<0.001	9.54±2.03	t=12.07 p<0.001
	No	68	2.40±0.50		5.03±2.53	
Total	Yes	171	3.70±0.62	t=18.13 p<0.001	9.19±2.14	t=14.77 p<0.001
	No	129	2.47±0.51		5.19±2.54	

ECT: Electroconvulsive Therapy; ECT-PK: Electroconvulsive Therapy Perception and Knowledge Scale; SD: Standard Deviation; t: Independent samples t-test

whole patient group was examined, it was determined that the level of knowledge of the patients who underwent ECT was higher than the patients who did not receive ECT (t=2.70, p=0.008). These results support the construct validity of the ECT-PK (Table 2).

The correlation coefficient between perception and knowledge subscales of the ECT-PK was r=0.726 (p<0.001) in the patient group, r=0.746 (p<0.001) in the control group, and r=0.735 (p<0.001) in all participants.

The criterion validity of the ECT-PK was assessed by comparing the perception and knowledge subscale scores of the scale among the participants according to their willingness to try ECT. It was determined that those who stated that they would accept ECT if it was suggested in the patient group, control group and among all participants had more accurate information and a more positive perception than those who did not accept it (Table 3). This result supports the criterion validity of the ECT-PK.

Reliability Analysis

Cronbach’s alpha coefficient was calculated for internal consistency in the reliability analyzes of the ECT-PK Scale. Cronbach’s alpha of the perception subscale of the ECT-PK Scale was calculated as 0.85 (Table 4), and 0.78 for the knowledge subscale (Table 5). Although the item-total correlations of the 2nd and 7th items of the knowledge subscale were low, the original form of the scale was preserved considering the content validity of the scale.

The test-retest reliability for the perception and knowledge subscales of the scale was calculated with the intraclass correlation coefficients, it was 0.863 for the perception subscale and 0.830 for the knowledge subscale, which was found to be statistically significant (p<0.001).

DISCUSSION

Electroconvulsive therapy is a treatment method that is used in the treatment of various mental disorders, and although its effectiveness and safety have been proven many times, it is influenced by unscientific negative approaches. Considering the determinant role of society in shaping attitudes towards ECT, our study included the diagnostic groups in which ECT is most frequently applied as well as a healthy control group. Approximately half of the patients in this study had received ECT in the past. This result may be related to the fact that the hospital where the study was conducted was a tertiary healthcare institution and served as a reference center, the presence of an ECT administration center within the hospital, and the inclusion of patients from the community mental health center where patients with chronic diseases such as schizophrenia and bipolar disorder were followed.

In present study, it was shown that patients who had previously undergone ECT had a higher level of knowledge and more positive perception than patients who did not. In a meta-analysis investigating the effect of ECT on knowledge and attitudes toward ECT, it was reported that ECT was associated with an increase in knowledge and a more positive perception in the patient group, similar to our study (5). These results support the

Table 4. Internal consistency analysis of ECT-PK Perception Items

		Content	Item, Mean (SD)	Item-Total Correlation	Cronbach's alpha if item deleted
1.	ECT can be lifesaving.	Attitude and opinions	3.62 (1.02)	0.550	0.853
2.	I have concerns about the possibility of memory loss after ECT.	Attitude and opinions	2.73 (1.05)	0.640	0.838
3.	I trust trained clinical staff will carefully administer ECT.	Role of health care provider	4.00 (0.95)	0.551	0.852
4.	I fear ECT may cause brain damage.	Emotional response	3.00 (1.15)	0.756	0.815
5.	I am frightened by ECT.	Emotional response	2.70 (1.19)	0.745	0.817
6.	I have fears that ECT may be painful.	Emotional response	2.99 (1.19)	0.661	0.834
	Total score (mean item score)		3.17 (0.84)	Cronbach's alpha coefficient=0.85	

Items 2, 4, 5 and 6 are reverse coded and presented in a corrected form. Higher scores indicate more positive perceptions. ECT: Electroconvulsive Therapy; ECT-PK: Electroconvulsive Therapy Perception and Knowledge Scale; SD: Standard Deviation

Table 5. Internal consistency analysis of ECT-PK knowledge items

		Content	No. Participants With Correct Responses (%)	Item-Total Correlation	Cronbach's alpha if item deleted
1.	ECT is used to treat suicidal behavior.	Treatment indication	218 (72.7)	0.388	0.774
2.	ECT works because it wipes out parts of your memory.	Misconception	96 (32.0)	0.003	0.812
3.	ECT is an outdated treatment.	Misconception	179 (59.7)	0.522	0.760
4.	One advantage of ECT is that it can work faster than medications.	Science	225 (75.0)	0.397	0.774
5.	ECT can be given safely to older persons.	Treatment indication	114 (38.0)	0.477	0.765
6.	ECT is used for control or punishment.	Misconception	201 (67.0)	0.436	0.770
7.	ECT causes the patient to have a seizure or convulsion.	Potential side effect	183 (61.0)	0.177	0.796
8.	Anesthesia is provided with ECT.	Procedure	200 (66.7)	0.531	0.760
9.	ECT is typically given a few times a week for several weeks.	Procedure	212 (70.7)	0.500	0.763
10.	During an ECT session, muscle relaxants are given.	Procedure	185 (61.7)	0.528	0.760
11.	There is a lot of scientific evidence for the effectiveness of ECT.	Science	235 (78.3)	0.569	0.758
12.	ECT is one of the safest procedures performed.	Procedure	193 (64.3)	0.649	0.747
	Total score (mean total no. accurate responses)		7.47±3.05	Cronbach's alpha coefficient=0.78	

ECT: Electroconvulsive Therapy; ECT-PK: Electroconvulsive Therapy Perception and Knowledge Scale

fact that patients who received ECT had more positive experiences in contrast to the negativities reflected in movies, which is one of the most important causes of negative perception and stigma associated with ECT (30). It has been suggested that the administration of ECT changes the attitudes toward ECT in two phases, with accurate information in the first phase and experiential learning in the second phase (31). In our study, the fact that both the knowledge levels of the patients who underwent ECT were higher and the positive correlation between their knowledge and perception levels supports this theory.

In the perception subscale of the ECT-PK, the most positively scored item was "I trust that the trained clinical staff will carefully administer ECT", while the most negatively scored item was "I am frightened by ECT". Similar results were found in the development study of the scale (16). The fact that the item related to the role of clinical staff in ECT administration in our study had a higher mean score (perceived more positively) than the study in which the scale was developed was associated with a higher rate

of patients who received ECT in our study. In a recent study conducted to determine attitudes about ECT, similar to our study, it was found that unfavorable results were related to emotional components of attitudes (eg, shame and fear), and this was more determinant in patients' negative attitudes towards treatment, for this reason, it was emphasized that these results should also be taken into account in future studies on attitudes (8).

The mean number of correct answers given to the questions in the knowledge subscale of the ECT-PK was 7.4, while it was 6.5 in the study in which the scale was developed. It was thought that the higher number of patients who had undergone ECT in the past and the collection of the patient group from the psychiatric hospital were effective in this result. The items that were answered correctly at the lowest rate were the items that indicated that ECT works because it wipes out some parts of the memory, and that it is safely administered to the elderly. In the development study of the scale, similar to our study, the safe administration of ECT to the elderly patient groups was one of the

items with the lowest rate of correct answers, and unlike our study, the item that ECT was one of the safest procedures performed was the item with the highest number of incorrect answers. The ages of patients undergoing ECT vary greatly between countries. In the USA, the country where the ECT-PK was developed, it has been shown that 30.3% of the patients who have undergone ECT in three different states in the last 20 years are over 65 years old (32). It has been reported that the rate of patients over 65 years of age among patients who underwent ECT in the UK in 2016–2017 was 46% (33).

In two previous studies conducted in the same hospital as our study, it was determined that 1.4% of the patients who received ECT in the years 2006–2007 (21), and 3.8% (only one patient) of the patients who applied ECT in an inpatient women's clinic between 2013–2015 were 65 years and older (34). The item regarding the administration of ECT to elderly patient groups seems striking in terms of showing the difference between scientific data and clinical practice regarding ECT and the perception and knowledge levels in society. Electroconvulsive therapy is an effective and safe treatment option, especially in elderly patients with depression, due to the high rate of treatment resistance and suicide risk, the presence of comorbid conditions, higher drug interactions, sensitivity to drug side effects, predisposition to physical or functional complications of the illness, and the need for a rapid treatment response (16,35). On the other hand, approximately 2/3 of the participants in both our study and the scale development study stated that ECT is not safe for elderly patients. The reason why the rate of elderly patients undergoing ECT in our country is quite low compared to western countries may be the prejudiced and negative social attitudes caused by misinformation about ECT, which negatively affect the decision-making processes of clinicians and patients/patient relatives.

In the validity analysis of the ECT-PK, as in the scale development study, the construct validity was determined by comparing the scale scores according to the history of ECT, and the criterion validity was determined by comparing the scale scores between those who accepted and those who did not accept ECT. In both construct and criterion validity analyses, it was found that patients who received ECT and those who accepted ECT had higher levels of knowledge and more positive perceptions. In line with these results, it was determined that the scale is a valid measurement tool.

In the reliability analyzes of the ECT-PK, the Cronbach's alpha reliability coefficient and item-total correlation of the perception subscale were used for internal consistency, and the test-retest method was used to determine the consistency of the scale over time, and the intraclass correlation coefficient was calculated. The Cronbach's alpha coefficient is 0.85 for the perception subscale and 0.78 for the knowledge subscale, and these values show that both subscales are reliable in terms of internal consistency (36). The item-total correlation coefficient of the perception subscale was found between 0.55–0.75, and in the knowledge subscale, it was found between 0.38–0.64 except for items 2 and 7. In our study, the item-total correlation coefficient of the 2nd item was calculated as 0.003, and the 7th item as 0.177. In the original development study of the scale, the item-total correlation coefficient for the perception subscale was found 0.36–0.71, and the knowledge subscale was found between 0.07–0.52. In our study, the correlation coefficient of the 2nd item was found to be 0.15, and the 7th item was found to be 0.19; however, the items were preserved in their current form, since removing any item did not significantly change the internal consistency without losing the content validity. In the literature, it has been reported that if the item-total correlation coefficient was below 0.3, the item could be removed from the scale, but this is not the only sufficient criterion and the effect of the item on the Cronbach's alpha coefficient should also be taken into account (37). Although the item-total correlation coefficients of the 2nd and 7th items of the ECT-PK knowledge subscale were below 0.3, both

items were not removed from the scale as it was done in the original study, considering that Cronbach's alpha did not change significantly if these items were deleted. In addition, the intraclass correlation coefficient comparing the results of two separate measurements of the scale made 14–21 days apart was found to be 0.863 for the perception subscale and 0.830 for the knowledge subscale, and these results support the reliability of the ECT-PK over time.

The limitations of our study are the inclusion of patients from different units affiliated with a single center, and the fact that the prevalence of ECT application may differ from other mental health centers since our hospital is a tertiary psychiatric hospital. Our findings need to be supported by the results of studies to be conducted in different centers providing mental health services. The results of the ECT-PK could not be compared with any other scale, therefore, concurrent and discriminant validity could not be evaluated. The construct and criterion validity of the scale was demonstrated by comparing the scale scores according to the history of ECT and willingness to try ECT, as in the original development study. Since the ECT-PK has not been adapted to a different language in the literature, its validity and reliability analysis could only be evaluated together with the results of the scale development study.

The inclusion of diagnostic groups in which ECT is frequently administered and a healthy control group in our study demonstrated that the is a valid and reliable measurement tool suitable for use in different populations. Preferences for the administration of ECT and attitudes towards ECT show cultural differences. It is important to use the ECT-PK to investigate these cultural differences which cannot be explained by scientific data in ECT application, to identify various misinformation and misperceptions that are likely to have an impact on these differences and to evaluate the effectiveness of the interventions to be made.

Ethics Committee Approval: Ethics committee approval of our research was obtained from Istanbul Bakırköy Dr. Sadi Konuk Training and Research Hospital Clinical Research Ethics Committee on 21.09.2020 with the decision number 2020-19-17.

Informed Consent: Informed consent was obtained from all participants included in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept- YEY, PÇA, NÖ; Design- YEY, PÇA, NÖ; Supervision- PÇA; Resource- YEY, PÇA, NÖ; Materials- YEY, PÇA, NÖ; Data Collection and/or Processing- YEY; Analysis and/or Interpretation- YEY, NÖ; Literature Search- YEY; Writing- YEY; Critical Reviews- PÇA, NÖ.

Conflict of interest: The authors declared that there is no conflict of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

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