RESEARCH ARTICLE

The Validity and Reliability of the Turkish Version of MacArthur Competence Assessment Tool for Treatment Decision: Correlates of Competence in Schizophrenia Patients

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ABSTRACT

Introduction: Informed consent is an indispensable condition of the clinical practice for the provision of health care. The main objective of this study is to translate the MacArthur competence assessment tool for treatment (MacCAT-T) into Turkish and evaluate the validity and reliability of the Turkish version in schizophrenia patients and healthy control subjects.

Methods: In this cross-sectional study, 30 hospitalized schizophrenia patients and 25 healthy subjects were assessed with MacCAT-T, Mental Competence Evaluation Form for Assessment of Competency (MCEF), Positive and Negative Syndrome Scale, Beck Depression Inventory, Mini Mental State Examination, Wechsler Adult Intelligence Scale (WAIS) – Similarities subtest and the Schedule for Assessing the Three Components of Insight. Psychometric properties of MacCAT-T were examined by intra-

class correlation coefficients and Cronbach's alpha values.

Results: Intra-class correlations ranged between 0.83 and 0.99 for four subscales of the tool. Cronbach alpha value of MacCAT-T was found 0.89. Severity of psychopathology and indices of insight were found to be negatively correlated with the subscales of the tool. WAIS-Similarities subtest scores were found to be positively correlated with understanding and reasoning subscales of MacCAT-T.

Conclusion: The Turkish version of MacCAT-T is a valid and reliable instrument for Turkish patients. The severity of psychopathology, insight and executive functions were shown to be significantly related to the decision making capacity in patients with schizophrenia.

Keywords: MacArthur competence assessment tool for treatment, mental competency, schizophrenia

INTRODUCTION

Informed consent is a sine qua non (indispensable) condition of ethical clinical practice for the provision of health care (1). To communicate an informed consent, a patient must have the legal competency for that decision. Legal competency is actually an integral concept not only for the health care system, but also for the whole forensic system. Measuring legal competency is a difficult process in many situations; regarding this difficulty a system of measurement was tried to be created in different areas including forensic medicine. Grisso et al. proposed that legal competence is not a categorical concept but can be defined as a spectrum and it should be decided specifically for each situation (2). This group, which was comprised of the researchers working in the field of forensic medicine, developed a tool to measure competency to make treatment decisions, by taking the concept of the ability to give consent one step further (2).

Informed consent on the clinical treatment decisions is not about only getting the signature of the healthcare recipient. Beyond that, it represents a process that needs to be dealt with major care. It requires individuals to have appropriate information including the purposes, benefits and risks of the treatment in question, as well as a prerequisite of the patient to have

freedom and capacity to give consent. The decisional capacity includes following four components: 1) understanding the relevant information 2) appreciating the situation and its consequences 3) reasoning about the treatment options 4) ability to make and communicate a choice (3). In certain psychiatric disorders, such as schizophrenia, patients may lack the capacity to make a treatment decision (4). In such cases, the clinicians find themselves in a controversial position between respecting the autonomy of the patients and protecting those with impaired decision-making capacity (3). For this reason, it has crucial importance to assess decisional capacity with an objective and reliable instrument instead of clinical judgment in patients with a psychiatric diagnosis. Among the instruments for assessing treatment-related decisional capacity, the MacArthur Competence Assessment Tools for Treatment (MacCAT-T), a semi-structured interview developed by Grisso and Appelbaum, has the most empirical support in a diverse population of medical as well as psychiatric patients (5). The original MacCAT-T validation study included 40 patients diagnosed with schizophrenia or schizoaffective disorder (2). The result of the study suggested that the MacCAT-T is a reliable and useful instrument in patients with acute psychosis. This instrument has some other advantages such as a detailed manual to guide administration

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and scoring, assessment of all four components of decisional capacity and good psychometric properties.

In Turkey, the informed consent process in the legal system is discussed in the most detailed form in the Code of Regulation on Patient Rights (6). This new regulation implemented in 2014 provides a series of improvements to the rights of patients. In this code, the decisional capacity is defined and the procedures to be implemented in the event of lack of capacity are explained in detail including the instructions and descriptions about the evaluations of the consent, individuals' states of consciousness, and the guardianship status. In the recent years, with an increasing awareness of the patients' needs about being included in the decisional processes and parallel to the developments in the patients' rights domain (7), psychiatric consultation requests on evaluation of treatment decisional capacity has increased. Generally, this evaluation is done based on the physician's clinical judgement in our country. Mental Competence Evaluation Form (MCEF) was developed in 2006 to assess the decisional capacity in Turkey (8), but MCEF focuses on the individual's competency about legal actions instead of the decisional capacity about treatment; and it is not clear whether MCEF is a valid and reliable tool for evaluating individuals with a mental disorder. Due to the absence of a mental health act in Turkey, assessing the decisional capacity in patients with mental disorders has greater importance regarding ethical concerns.

Due to the abovementioned reasons, there is a need for a reliable instrument in Turkish to evaluate decisional capacity in patients who have mental disorders. In this study, we aimed to 1) adapt MacCAT-T to Turkish 2) analyze the psychometric properties of Turkish version of MacCAT-T and 3) investigate the decisional capacity in patients with schizophrenia.

METHODS

Subjects
The patients who were admitted to the psychiatric ward of Hacettepe University Hospitals between December 2015 and December 2018 and were diagnosed with schizophrenia were included in the study. All the patients were recruited in the first 72 hours of their admission. After being informed about the study, signed consent was obtained from the patients themselves or their legal guardians if they were considered to be unfit to give consent. Patients with dementia, delirium, intellectual disability and severe depression or who refused to participate in the study were excluded. Additional data were collected from age, gender and educational level matched control subjects without any mental disorders. The control subjects were recruited from hospital staff's acquaintances.

The patient group included 30 subjects, and the control group included 25 healthy subjects without psychiatric disorders. A total of 37 patients meeting the inclusion criteria were approached in the first 72 hours of their admission. Seven of them declined to participate in the study; none of the reasons to decline were related to the positive symptoms of the disease, such as delusions of persecution.

The study was approved by the Ethics Board for Non-interventional Clinical Research of Hacettepe University, Faculty of Medicine.

Procedure
Diagnostic assessments of all participants were done on the basis of DSM-5 criteria by two independent psychiatrists. The scales related to the study were performed by one of the two researchers (AAK or EM). As recommended in the original study, both researchers had gone through a training process during which a certain number of patients and healthy controls were interviewed by all the researchers using MacCAT-T scale. When administering MacCAT-T interview, the disclosure of information

was made based on a standardized information about the disease regarding the main symptoms and treatment choices, but the content was adapted to the patients regarding their symptoms and their treatment.

During MacCAT-T interviews with healthy controls, the subjects were given a scenario in which they had a diagnosis of schizophrenia and needed a certain type of treatment. The appreciation questions were also asked to the healthy control subjects in our study as contrary to the original one; these subjects were asked to reach a conclusion as if they had the disorder mentioned in the scenario. This method was chosen in order to compare the results between two groups regarding the validity of the Turkish version of the scale.

For the assessment of inter-rater reliability; the MacCAT-T interviews of 20 patients with schizophrenia were transcribed, then both interviewers rated the interviews separately according to these records.

Measures
Demographic Information Questionnaire
This questionnaire included questions about sociodemographic information of participants.

MacArthur Competence Assessment Tool for Treatment
The MacCAT-T was developed by Grisso and Appelbaum in 1997 (2). This instrument is a semi-structured interview procedure which guides clinicians on the assessment of patients' capacities to make decisions about their treatment based on the given information. Subscales of the MacCAT-T were named according to the dimensions of the treatment-related decision-making capacity: understanding, appreciation, reasoning and expression of choice.

When administering MacCAT-T, the patient is informed about the characteristics of his/her disorder, the recommended treatment, the possible benefits and risks of this treatment and alternative treatment options. The patient is then asked to express his choice of treatment and explain how he/she has made the choice. The patient's responses are documented by the interviewer and each subscale ratings are calculated.

The summary scores for the subscales are rated: 0–6 for understanding, 0–4 for appreciation, 0–8 for reasoning, and 0–2 for expressing a choice. Incompetence in one subscale of MacCAT-T may indicate that the person's decision-making capacity is impaired even if other subscale scores are normal. Therefore, the MacCAT-T has no cutoff score.

The translation of the MacCAT-T was performed by one of the researchers who was proficient in English, then this form was back-translated into English by another researcher who had not read the original form. The final version of the Turkish form was generated after being controlled and compared to the original text by two senior psychiatrists. Written permission for this study was obtained from the authors of the original MacCAT-T.

Mental Competence Evaluation Form for Assessment of Competency
This scale was developed and evaluated for validity and reliability by Can et al (8). This is a clinician-rated psychiatric assessment tool to determine competency about legal actions. The Mental Competence Evaluation Form for Assessment of Competency (MCEF) consists of 4 items: decision making, rationality of conclusions, reasoning and appreciation. Appreciation includes three sub-items: understanding, actual understanding and discernment. First three items and three sub-items of appreciation can be rated between 0 (reflects incompetency) to 3 (indicates highest level of competency). MCEF was used in this study for comparison of validity.

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The Mini Mental State Examination

The Mini Mental State Examination (MMSE) is a 30-point questionnaire that examines general cognitive performance. The MMSE was developed by Folstein et al (9). Higher scores on MMSE indicates higher cognitive function. The validity and reliability of the Turkish version of this scale was done by Güngen et al (10). In this study, MMSE was used to exclude participants with neurocognitive disorders.

The Beck Depression Inventory

The Beck Depression Inventory (BDI) is a 21-item, self-report questionnaire that measures the severity of depression. The BDI was developed by Beck et al (11). The validity and reliability studies of Turkish version were completed by Hisli (12). BDI was used in this study for excluding participants with severe depressive symptoms.

Wechsler Adult Intelligence Scale

Wechsler Adult Intelligence Scale (WAIS) was developed by Wechsler to measure intelligence in adult and late adolescents. The original form was published in 1955 (13). The validity and reliability study of the Turkish version was performed by Epir and Iskit (14). WAIS consists of eleven subtests providing three separate IQ points. Of these "Similarity" sub-scale measures verbal abstract reasoning and found highly correlated with general intelligence (15, 16). This subscale was used in our study in order to measure abstract reasoning and executive function of the participants.

The Schedule for Assessing the Three Components of Insight

The Schedule for Assessing the Three Components of Insight (SAI) was developed by David (17) for the assessment of insight in psychotic patients. This instrument is a semi-structured scale that consists of 8 questions. High scores indicate a high level of insight. The validity and reliability study in Turkish was published by Aslan et al (18).

Positive and Negative Syndrome Scale

Positive and Negative Syndrome Scale (PANSS) is a semi-structured 30-item scale that measures positive, negative and general symptoms of schizophrenia (19). Seven items of this scale belong to the positive syndrome subscale, other seven items belong to the negative syndrome subscale and the remaining 16 items to the general psychopathology subscale. Each item is scored from 1 to 7 points. Four different scores are obtained: positive, negative and general psychopathology scores and a total PANSS score. The validity and reliability study of the Turkish version of PANSS was performed by Kostakoğlu et al (20).

Statistical Analysis

All the statistical analyses were performed using the SPSS 22.0 (SPSS Inc, Chicago, IL, USA). Categorical variables are presented as number and percentage and continuous variables are presented as mean and standard deviation, median and interquartile range (IQR) values. Comparison of categorical variables was done by chi-square, continuous variables of the two groups were compared by the Mann-Whitney U test since the parametric test conditions were not met.

Inter-rater reliability of MacCAT-T was evaluated with intra-class correlation coefficients. Cronbach alpha coefficient of MacCAT-T and summary components were calculated to show internal consistency. To evaluate the relationship between MacCAT-T and the other scales; correlation coefficients and statistical significance were determined by Spearman test because the variables were not normally distributed. P values less than 0.05 were considered statistically significant.

RESULTS

Descriptive and Clinical Characteristics

The sample consisted of 55 participants (schizophrenia N=30, healthy control N=25). In the whole sample, mean age was 37.8±11.8 and 44%

Table 1. Descriptive characteristics of the participants (N=55) #

	Schizophrenia	Controls		
	N=30 (%)	N=25 (%)	χ²	p
Gender			0.246*	0.620
Female	14 (47)	10 (40)		
Male	16 (53)	15 (60)		
Marital status			13.136**	0.001
Married	4 (13)	15 (60)		
Single	21 (70)	8 (32)		
Separated/Divorced	5 (17)	2 (8)		
Paid employment			9.241*	0.002
Yes	12 (40)	21 (84)		
No	18 (60)	4 (16)		
	Median (IQR)	Median (IQR)	U	p
Age	36 (21)	37 (20)	361.000	0.813
Education (years)	12 (8)	11 (6)	365.500	0.871

Chi-square test and Mann-Whitney U test results IQR: Interquartile range *df=1 **df=2

(N=24) of the participants were females. There were no significant group differences in age, gender and years of education among diagnostic groups, except marital status and paid employment status (Table 1).

The schizophrenia group exhibited lower scores in Understanding, Reasoning and Appreciation subscales of MacCAT-T than the control group (Table 2). The schizophrenia group had lower total score in the MMSE and WAIS-Similarities. Psychopathological characteristics of the schizophrenia group are presented in Table 2.

Table 2. Clinical characteristics of the participants (N=55) #

	Schizophrenia (N=30) Median (IQR)	Controls (N=25) Median (IQR)	U	p
MacCAT-T				
Understanding	4.75 (2.68)	5.6 (0.7)	195.500	0.003
Reasoning	2 (5)	7 (2)	106.000	<0.001
Appreciation	3 (2.25)	4 (1)	228.500	0.009
Expressing a choice	2 (0)	2 (0)	325.000	0.06
MMSE	25 (6.25)	28 (2)	149.500	<0.001
WAIS-Similarities	13 (12.5)	21 (10)	179.000	0.001
PANSS				
Positive	21 (9.5)	NA		
Negative	22 (10.25)	NA		
General psychopathology	35 (13.75)	NA		
Total	76.5 (30.75)	NA		
BDI	7.5 (10.75)	NA		
MCEF	6 (6)	NA		
SAI	8.5 (6.25)	NA		

Mann-Whitney U test results IQR, interquartile range; MacCAT-T, MacArthur competence assessment tool-treatment; MMSE, standardized mini-mental state examination; WAIS, Wechsler adult intelligence scale; PANSS, positive and negative syndrome scale; BDI, Beck depression inventory; MCEF, mental competence evaluation form; SAI, schedule for assessing the three components of insight; NA, not applicable.

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Psychometric Properties of the Turkish Version of MacCAT-T

The intra-class correlation coefficients of the two raters on the MacCAT-T summary scores were calculated as 0.99 for understanding, 0.87 for reasoning, 0.85 for appreciation and 0.83 for expressing a choice. The correlations indicated a high inter-rater reliability.

For the internal consistency, the Cronbach's alpha value of MacCAT-T was 0.889. As the results of the Cronbach's Alpha values of the summary components of MacCAT-T show, internal consistencies were good for understanding and reasoning, and acceptable for appreciation (Table 3).

Table 3. The Cronbach's alpha values of MacCAT-T and each MacCAT-T elements (N=55) #

	Cronbach's alpha	Number of items
MacCAT-T	0.889	21
Understanding	0.859	13
Reasoning	0.829	5
Appreciation	0.530	2

"Expressing a choice" was not presented because of consisting of only 1 item. MacCAT-T, MacArthur competence assessment tool-treatment.

For the comparison of the patients' performance on the MacCAT-T, ratings on the four components of the original MacCAT-T study (2) were used (Table 4). In the schizophrenia group, 46.7% of the patients had ratings greater than 5, and 33.3% of the patients had ratings 4 or lower in understanding. In reasoning, 53.4% of the patients had ratings 3 or lower. In appreciation, 56.7% of the patients had adequate ratings (3 or higher). In the control group, all of the participants had ratings greater than 4 in understanding, and only three (12%) of the participants had ratings 3 or lower in reasoning (Table 4). The comparison of the control group is also presented in the Table 4.

Table 4. Ratings on scales of Turkish version of MacCAT-T and comparison with the results of the original MacCAT-T study (2)

	Patients		Controls	
	Turkish version of MacCAT-T N=30 (%)	Original MacCAT-T N=40 (%)	Turkish version of MacCAT-T N=25 (%)	Original MacCAT-T N=40 (%)
Understanding				
6 to 5.1	46.7	33	84	90
5 to 4.1	20	35	16	5
4 to 3.1	10	15	0	5
3 to 2.1	10	13	0	0
Less than 2.1	13.3	5	0	0
Reasoning				
8	3.3	20	44	30
7 to 6	23.3	33	36	40
5 to 4	20	18	8	25
3 to 2	16.7	5	12	3
1 to 0	36.7	15	0	3
Appreciation#				
4	26.7	78	60	NA
3	30	5	24	NA
2	20	8	8	NA
1	13.3	8	4	NA
0	10	3	4	NA

NA; not applicable # In the original MacCAT-T study control subjects were not asked the questions in the appreciation scale.

The Decisional Capacity and Its Clinical-Psychopathological Correlates

The correlation analysis revealed that MacCAT-T scores had no significant correlation with age and years of education. There were positive correlations between the MMSE score and understanding and reasoning scores. Besides, significant positive correlations were found between WAIS-Similarities score and understanding and reasoning scores (Table 5).

In the schizophrenia group, PANSS total score and all subscale scores were negatively related to MacCAT-T understanding performance (Table 6). General psychopathology score of PANSS was negatively correlated with reasoning and appreciation. PANSS total score and Positive subscale score were significantly related to appreciation. There was no significant correlation between expressing a choice and PANSS total and subscale scores (Table 6). There were positive correlations between BDI score and understanding and reasoning scores. A strong positive correlation was found between SAI score and understanding. Additionally, SAI score was significantly correlated with reasoning. The correlation analysis conducted between MacCAT-T and the other capacity evaluation instrument in Turkish (MCEF) revealed that the correlation coefficients were strong for understanding and reasoning, while moderate for appreciation. Expressing a choice was not correlated with any scale scores used in this study (Table 6).

DISCUSSION

Assessment of the capacity to consent to treatment in everyday clinical practice is important for both the patients and the clinicians. When there is a doubt about a patient's capacity to make a decision on a treatment, in our country, psychiatrists and other expert clinicians are generally consulted. The clinicians' evaluation in general is based on the clinician's subjective judgement and prone to be biased.

MacCAT-T is one of the most reliable and frequently used semi-structured interview tools for the assessment of treatment decision making capacity in the patients (21). MacCAT-T requires questions and acceptable answers be tailored to the specific situation and has a manual giving detailed instructions on preparation and scoring of the items. In the original study, it was reported that the clinicians became comfortable with the method after using it one or two times, thus training is required for the administration of this tool. Especially for the ambiguous cases, and in legal procedures requiring the patient's capacity evaluation, this method would have benefits over the classical clinical judgement of a clinician.

As MCEF is the only tool for a capacity evaluation in Turkish, we compared MCEF scores with the subscale scores of MacCAT-T and found a positive correlation with all the subscales except expressing a choice. Both legal capacity and treatment decision-capacity are similar constructs regarding the subjects should understand a certain situation, make inferences about it, appreciate its consequences and finally conclude a decision. This correlation additionally proved that MacCAT-T is a suitable tool for evaluating the decision-making capacity. Hence this study is the first one to validate a standardized measurement method to assess patients' decision-making capacity for treatment in Turkey.

The inter-rater reliability indices in our study were similar to the original study, except "expressing a choice", but the intra-class correlation for this item was also very high, indicating that the tool had good inter-rater reliability (2). Likewise, internal consistency of the tool was high, except "appreciation" item. Expressing a choice subscale was not correlated with any of the demographic and clinical parameters in our study. This result may be associated with the schizophrenia patients' characteristics in this study regarding the low rate of refusal to participate which shows a higher capacity to cooperate in treatment. In addition, some studies showed

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Table 5. Correlations between MacCAT-T and the demographic and clinical parameters (N=55)

MacCAT-T	Understanding	Reasoning	Appreciation	Expressing a choice
Age	0.050	0.056	0.090	-0.139
Education (years)	0.205	0.225	-0.103	0.038
MMSE	0.478*	0.535*	0.157	-0.031
WAIS-Similarities	0.453*	0.460*	0.028	0.087

* Spearman p<0.01 SMMSE, standardized mini-mental state examination; WAIS, Wechsler adult intelligence scale.

Table 6. Correlations between the MacCAT-T and PANSS, BDI, MCEF, SAI scores in the schizophrenia group (N=30)

	MacCAT-T Understanding	MacCAT-T Reasoning	MacCAT-T Appreciation	MacCAT-T Expressing a choice
PANSS				
Positive	-0.391*	-0.211	-0.365*	-0.115
Negative	-0.413*	-0.220	-0.208	-0.352
General psychopathology	-0.467**	-0.436*	-0.409*	-0.168
Total	-0.444*	-0.353	-0.426*	-0.249
BDI	0.388*	0.373*	0.329	0.081
MCEF	0.635**	0.796**	0.493**	0.121
SAI	0.690**	0.423*	0.259	-0.050

* Spearman p<0.05, ** p<0.01 PANSS, positive and negative syndrome scale; BDI, Beck depression inventory; MCEF, mental competence evaluation form; SAI, schedule for assessing the three components of insight.

that schizophrenia patients had an improved decisional capacity after an intensive educational intervention as the raters did with MacCAT-T while evaluating the patients (4). Some other studies found that schizophrenia patients are more likely to have impaired emotional decision making than cognitive decision-making capacity (4), in a structured treatment environment like in our study these patients may have had an improved final decision. Finally, expressing a choice may actually lack correlations with symptoms of schizophrenia or insight. It is often impaired in conditions which result in neurological deficits such as cognitive and language disorders or aphasia (22). What is measured in this item is not the rationality or logicalness of the choice, but the ability to declare a selection. As it is one of the major components of the decision-making process (3), it should be included as the final item of the MacCAT-T tool, but still it should be further evaluated in different diagnostic populations and different settings in future studies.

Compared with the original study, the scores' distribution of the schizophrenia patients was similar on the understanding subscale, while reasoning and appreciation scores' distributions were somewhat different. On reasoning subscale, more than 50% of the schizophrenia patients in our study had less than 3 points over an 8-point scale, compared to 20% in the original study. On appreciation subscale, only a quarter of our patients had 4 points while 80% of the ones in the original study had 4 points over a 4-point scale (2). This discrepancy may be explained by the time range of the interview: we recruited our patients in the first 72 hours of their hospitalization, Grisso et al. preferred the first 8 days of the hospitalization for the interview. In 8 days, with the introduction of an effective treatment plan, a patient may gain at least a partial insight to the situation and establish a rapport with the treatment team. In a meta-analysis by Wang et al (4), the schizophrenia patients from 10 studies were found to have diminished capacity in all four

areas, understanding, reasoning, appreciation and expressing a choice, compared to healthy controls. In our study, the healthy control subjects' scores showed a skewed distribution in the direction of higher scores in all subscales, this finding was also in accordance with the original study (2). A few of the healthy control subjects scored on the lowest level on some subscales. The control group in our study has been given a hypothetical mental health situation resembling psychosis and a suitable hypothetical treatment scenario for this condition; this situation may have caused a difficulty in abstracting and making inferences under the scenario.

As in many studies including the original one, sociodemographic variables such as age and education level were not found to be correlated with the total and subscale scores of MacCAT-T. This finding may be due to the flexible structure of the assessment tool; the clinician selects the content of the information to be disclosed to the patients based on the patient's diagnosis, prominent symptoms and the treatment method needed. During this preparation process, the clinician also makes necessary adjustments according to the patient's age and education. MacCAT-T thus is a suitable interview measure for a wide range of patients from different education levels.

Different diagnostic groups and their capacity in deciding the treatment were examined in many studies before, and generally the subjects with psychotic illnesses were found to be more impaired on decision-making capacity compared to the subjects with non-psychotic mental disorders (usually depression) (23, 24). Severity of psychopathology was also found to be associated with many aspects of the decision-making in previous research (25, 26). In our study, we found that PANSS positive scores were negatively correlated with understanding and appreciation, and PANSS negative scores were negatively correlated with understanding score while the general psychopathology scores from PANSS were all negatively

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correlated with understanding, reasoning and appreciation. Increasing severity of symptoms seems to be related to reduced capacity. This is an expected finding since severity of symptoms in psychotic disorders are mostly reverse related to the insight. This is also in accordance with our results, SAI scores are negatively correlated with understanding and reasoning, which implies the less insight, the less decision-making capacity one has for own treatment.

Cognitive dysfunction has long been hypothesized to influence decision-making capacity in both psychiatric and non-psychiatric patient groups. Memory, attention and executive functions play an important role in holding information and executing a decision (27). Executive dysfunction in severe mental disorders such as schizophrenia and bipolar disorder appears to affect abstract reasoning, concept formation, planning, prediction and metacognition reflecting insight to one's situation. Schizophrenia patients have long been known to have cognitive disabilities, especially impairment in executive functions. In our study the schizophrenia group had lower scores on WAIS similarities sub-test, reflecting an executive dysfunction as in many other studies; and WAIS similarities scores were positively correlated with understanding and reasoning scales of MacCAT-T. This finding supports the hypothesis that decision-making capacity is correlated with executive functions. Our finding is also in accordance with studies in the literature showing a correlation between executive functions and capacity to consent to treatment (28, 29).

Our study had some limitations. The sample was small, and the study group included hospitalized patients only with a diagnosis of schizophrenia. Including other diagnostic groups such as depression, anxiety disorders or substance abuse, and recruiting outpatients from outpatient psychiatry clinics would probably yield different results. However, this study had some strong features: the severity of psychopathology was measured with PANSS, a semi-structured interview method administered by researchers. We correlated the severity of both positive and negative symptoms of schizophrenia with decision-making capacity and showed that negative symptoms were also correlated with the capacity as well as positive ones. We also measured the executive functions of our patients, which in schizophrenia patients an important part of the disease and related to negative symptoms and found that executive functions were also correlated with decision making capacity. The level of insight was additionally evaluated in detail. Insight has been found as one of the strongest clinical constructs in previous studies (30), and we reached the same conclusion in our study.

Due to the absence of a mental health act in Turkey, patients with psychiatric disorders are among the most affected. There are efforts targeting the improvement of the patients' rights like the implementation of Code of Regulation on Patient Rights in 2014. Adapting and using MacCAT-T might play a role in implementing appropriate treatment informing process to routine clinical practice and developing guidelines on other legal and ethical areas regarding the patients' rights in every group.

CONCLUSIONS

In conclusion, the findings of this study show that MacCAT-T in Turkish is a valid and reliable tool that could be used to evaluate the decision-making capacity for treatment in healthy subjects and schizophrenia patients. Patients with schizophrenia were found to have diminished capacity in making decisions on their treatment in our study; and their capacity was found to be related to the severity of psychotic symptoms and cognitive impairments inherent to the disease. Further studies on different mental disorders such as depression, dementia and others are required to evaluate the capacity for making treatment decisions in these diagnoses.

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