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Turkish Version of the Psychosis Attachment Measure: A Reliability and Validity Analysis

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ABSTRACT

Background: There is a need for a tool to assess the attachment in psychosis in the Turkish-speaking population. This study aims to evaluate the validity and reliability of the Turkish version of the Psychosis Attachment Measure of patients with schizophrenia.

Methods: The sample of this study consists of 80 patients diagnosed with schizophrenia who have applied to a psychiatry outpatient clinic. Researches completed Positive and Negative Syndrome Scale and Calgary Depression Scale for schizophrenia. Patients were then asked to fill out the Psychosis Attachment Scale and Adult Attachment Style Scale by themselves.

Results: The structure and content of the factor structure are suitable for the Turkish version ($P < .001$). In assessing the test–retest internal consistency for the Turkish version of Psychosis Attachment Measure, Cronbach's alpha values range from 0.738 to 0.922. The retest correlations for the subscales prove good retest reliability ($P < .001$).

Conclusion: The findings show the Turkish version of the Psychosis Attachment Measure to be a reliable and valid measure for evaluating the attachment styles of patients with schizophrenia.

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INTRODUCTION

Attachment theory is a lifetime developmental theory. It describes how building close, affectionate bonds is a common need with attachment behavior functioning as a homeostatic mechanism to alleviate distress in childhood and adulthood.[1] This theory assumes interpersonal relationships in early life to affect future interpersonal functionality and defines ways for regulating distress or representations about the self and others in relationships. When caregivers respond and are sensitive to distress, individuals develop a secure attachment style. The secure attachment style is associated with a positive self-image, a capacity to handle distress, the development of autonomy, and healthy relationships with others.[2] But, if caregivers are uncaring and passive to distress, individuals either feel more distressed in case of their attachment need (insecure anxious or ambivalent attachment) or deactivate their attachment system with low affection levels or avoid close relationships (insecure avoidant attachment).[3]

Although many different methods exist for conceptualizing adult attachment, Brennan et al[4] introduced the 2 dimensions of insecure attachment: attachment anxiety and attachment avoidance.Attachment anxiety is associated with interpersonal relationship styles requiring excessive demand and overlapping negative self-image, fear of rejection, and high-level adverse effects. Attachment avoidance is associated with a negative image of others, minimization of the impact of relationships as a defense, interpersonal hostility, and social withdrawal.[3,5]

Association between insecure adult attachment and various psychopathologies has been shown.[6,7] There is a growing body of literature regarding the relationship between attachment and psychosis.[8,9] Interruption of the attachment process is an essential factor in the development and maintenance of psychosis.[10] In schizophrenia, attachment characteristics are essential because psychotic experiences are frequently challenging at high levels, and attachment styles are triggered and determined by how one approaches seeking help through a psychologically distressing period.[11] Research has shown interpersonal factors also to have a role in predicting the course of psychosis in addition to predispositions. The high incidence of negative interpersonal experiences and traumas in psychosis and the evidence from longitudinal studies showing negative environmental experiences have brought the onset of psychosis forward in support of relationship with attachment and psychosis.[12] Some

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evidences also showed a relationship between a person's negative self-beliefs, beliefs about others, and psychotic symptoms.[13] Moreover, insecure adult attachment, which is associated with dysregulating distress and negative beliefs about self and others, is associated with psychosis.[14] Also, insecure adult attachment can increase the likelihood of developing psychotic symptoms or adversely affect the course of psychosis.[8] Clinically observable relationship between insecure attachment styles and onset, course, and treatment of the psychotic disorders is considered.[14]

Particularly in the first psychotic episode, specifying secure or insecure attachment styles and assessing the cognitive-affective-interpersonal model helps develop treatment models specific to the needs of the individual.[9] In a meta-analysis, researched the effects of attachment styles on the etiology and prognosis of psychosis, low-to-medium level relationships have been found between attachment styles and positive and negative symptoms and depression. In particular, insecure attachment is discussed as a risk factor in the treatment of psychosis.[15,16]

Results from studies investigating the relationship between psychotic symptoms and attachment styles are contradictory. Some studies showed no correlations between the clinical presentations; others showed correlations between positive and negative symptoms or only positive symptoms and attachment styles.[17-22] A limited number of studies examining the relationship between attachment and depression levels in patients with psychosis found a connection between insecure attachment styles and depression. Although depression is associated with both attachment anxiety and attachment avoidance, the relationship between depression and attachment anxiety stands out. It has even been shown to be predictive of attachment anxiety.[20,23]

Various scales exist for determining attachment styles. Bartholomew and Horowitz[5] defined 4 attachment patterns based on the positive and negative options from Bowlby's self and others model and developed the Relationships Questionnaire and Relationship Scales Questionnaire. Brennan et al[24] developed the Experiences in Close Relationships Inventory. These measures have validity and reliability for Turkish.[24] Another measurement tool is the Parental Bonding Instrument.[25] This instrument is one of the first measures to be established based upon Bowlby's theory of attachment. The measure was adapted into Turkish by Kapçı and Küçüker.[26] Although various attachment measures are available, only the Psychosis Attachment Measure (PAM) is a specific attachment measure for patients with psychosis.[27]

MAIN POINTS

- Studies indicate that there will be a relationship between attachment and psychosis.
- There is a need for an assessment tool that examines attachment in psychosis in Turkish-speaking people.
- Turkish version of the Psychosis Attachment Measure is a reliable and valid measure for evaluating individuals' attachment styles with schizophrenia.
- Also, there is a relationship between the context in psychosis and depression.

In this current study, we aim to investigate in the context of psychosis and attachment studies whether the Turkish version of the PAM is a valid and reliable measure for a Turkish sample of patients with psychosis. As mentioned above, since there is a relationship between attachment and depression in psychosis and psychotic symptoms severity, we considered that examining the relationship between these symptoms and attachment is vital in evaluating the validity of PAM. In the light of the literature and theoretical knowledge, we expect a positive relationship between insecure attachment and the severity of psychotic symptoms and depression.

METHODS

Sample and Process

The sample of this study is composed of patients with a diagnosis of schizophrenia who have applied to a training and research hospital outpatient psychiatry clinic in Turkey between June 1 and December 31, 2018, who have agreed and given consent to participate in the study, and who meet the inclusion criteria for participation. A total of 80 patients have been recruited in the study. To minimize the probability of selection bias, all the outpatient clinic's patients were invited to the survey. The criteria required from the patients recruited to the study are a diagnosis of schizophrenia, the ability to give informed consent, literacy, having no history of organic etiology for schizophrenia, being free of alcohol-substance abuse, and being 18-65 years old. The patients' diagnoses were confirmed through re-examination by applying the Structured Clinical Interview for DSM-IV-TR Disorders (SCID) and previous medical records. Patients with active psychotic symptoms, a diagnosis of schizoaffective disorder or explicit affective symptoms, or learning difficulties have been excluded from the study. To obtain information about the patients, they filled in a demographic data form; Positive and Negative Syndrome Scale (PANSS), Calgary Depression Scale for Schizophrenia (CDSS) were completed by a clinician. Patients filled in the Psychosis Attachment Scale (PAM) and Adult Attachment Style Scale (AAS) by themselves. After 4 weeks, the study sample was called back for control and filled in the Psychosis Attachment Scale again for Temporal validity analysis.

The necessary permission to conduct this study was obtained from Ethics Committee of Ankara Diskapi Yildirim Beyazit Training and Research Hospital (Date: May 15, 2017, Decision Number: 38/24).

DATA COLLECTION TOOLS

Demographic Data Questionnaire

This form was created by researchers to obtain information about the patient. It consists of demographic characteristics such as age, gender, marital status, and education level.

Psychosis Attachment Measure

This is a 16-item self-reported questionnaire developed by Berry et al[27] for patients with psychosis and evaluates attachment in 2 dimensions: anxious and avoidant. These items have been derived from a self-report measure of attachment, but none specifically refer to romantic relationships.[4,27] The scale scores each item, which questions aspects of participants' relationships with the significant others in their lives, on a 4-point Likert-type scale (not at all, a little, quite a bit, and very much). The total score is calculated by averaging the individual item scores for each dimension, with high scores indicating high levels of anxiety/avoidance. A validity and reliability study for the Turkish version of this scale has not been conducted before. Approval was obtained from Katherina Berry, who developed the original scale. The English version of the scale was translated into Turkish by 3 experts who are proficient in English. A final text was prepared based on these 3 translations. Then the scale translated into Turkish was then back-translated by a native English speaker, and a high level of fit was found with the original scale.

This measure has some advantages over existing attachment measures: Items are scored with a simple-and-fixed 4-point Likert-type scale and, unlike most other self-report measures, can also be used by individuals who do not have romantic partners currently or have not recently. The 2-dimensional assessment of the attachment, anxious and avoidant, facilitates making comparisons with past and future studies.

The Adult Attachment Style Scale

This scale consists of 2 parts. The first part, developed by Hazan and Shaver,[28] consists of 3 different statements that each includes definitions about relationship characteristics with parents and general behavioral characteristics in childhood and is used for classifying adults as secure, anxious/ambivalent, or avoidant.[28] The second part developed by Mikulincer et al[29] consists of 15 items, each of which participants are asked to score from 1 to 7.[9] Each attachment style is represented by 5 items, where the attachment style with the highest score determines the attachment style of the individual filling out the scale. The validity and reliability study for the Turkish sample was made by Kesebir et al.[30] The scale will be used as a reference measure because it is easy to apply and is the most current scale in terms of validity and reliability studies in Turkish. Cronbach's alpha for secure, avoidant, and anxious/ambivalent attachment is 0.72, 0.82, and 0.85, respectively.[30]

Positive and Negative Syndrome Scale

This scale was developed by Kay et al.[31] It is a 7-point, semi-structured interview scale consisting of symptom-severity assessment in schizophrenia with 30 items. Of the 30 psychiatric parameters evaluated by PANSS, 7 belong to the positive syndrome subscale, 7 to the negative syndrome subscale, and the remaining 16 to the general psychopathology subscale. The validity and reliability study of the scale in Turkey was conducted by Kostakoğlu et al.[32] In the Turkish version of PANSS, the total Cronbach's alpha values of the positive syndrome subscale, negative syndrome subscale, and general psychopathology subscales were found to be 0.75, 0.77, and 0.71, respectively.[32]

Calgary Depression Scale for Schizophrenia

This 4-point Likert-type scale developed by Addington et al[33] is evaluated by the interviewer and consists of 9 items: depressive mood, hopelessness, feelings of worthlessness, offensive thoughts about guilt, pathological guilt, morning depression, early waking, self-destruction, and observed depression symptoms.[33] The reliability and validity study of the Turkish version of this scale was conducted by Aydemir et al.[34] Cronbach's alpha for the scale was found to be 0.90.[34]

Statistical Analysis

This study has performed statistical analysis using Number Cruncher Statistical System (NCSS) Statistical Software (2007, LLC. Kaysville, Utah, USA). In addition to the descriptive statistical methods (mean and standard deviation (SD)), histogram and 5% Trimmed Means have been used when evaluating the data to look at the distribution of variables to evaluate normality and outliners. One-way analysis of variance has been used for comparisons between groups with normal distribution, Tukey's multiple comparison test for subgroup comparisons, independent *t*-test for comparing binary groups, and Pearson's correlation test for determining the relationships among the variables. Internal consistency of the PAM scale has been determined using Cronbach's alpha. Test-retest reliability was determined using Cronbach's alpha, intraclass correlation coefficient (95% CI), Spearman's correlation test, and paired *t*-test. The underlying factor structure of the measurement has been assessed using Kaiser-Meyer-Olkin (KMO) and Bartlett's tests. The results are assessed at the $P < .05$ level of significance.

RESULTS

Sample

Of the participants, 71.2% (n=57) are male and 51.2% (n=41) are single. Participants' mean age in years is 40.34 (SD= 8.57). The average duration of education in years is

7.99 (SD = 4.09), the mean duration of disorder in years is 17.35 (SD = 8.07), and the mean age of onset in years is 23.36 (SD = 6.92). The demographic and clinical features of patients are shown in Tables 1 and 2.

Psychosis Attachment Measure—Descriptive Statistics

To evaluate normality and outliners, histogram and 5% Trimmed Means show normality for scores of all 16 items. The result of power analysis for factor analysis shows a sample with 60 participants can detect misspecifications of a model with a power of 99.8% on an alpha error of 0.05.

To determine the underlying factor structure of PAM's adaptation to Turkish, analysis of the principal components has been conducted over 16 items using varimax rotation. Assessment of the factor structure clearly demonstrates a 2-factor solution, which is consistent with the findings from the English and Spanish versions of PAM. Therefore, we continued the analysis by fixing the extracted components in 2. The Kaiser-Meyer-Olkin measurement confirms the sampling is adequate for analysis (KMO = 0.721), and Bartlett's test of sphericity ($\chi^2 = 371.92$; $P < .001$) indicates the correlations between items to be sufficiently large. The results reveal 2 different factors when loading all the questions on the expected factor. After rotation, the loads range from 0.443 to 0.751, and no item cross-loads greater than 0.209 on the other component (Table 3). The 2 dimensions account for 46.62% of the total variance, with the first dimension (anxiety) accounting for 26.33% and the second dimension (avoidance) accounting for 20.29%.

Table 1. Socio-demographic and Clinical Data of the Patients Participating in the Study

	Number (N)	Percentage	Mean (SD)
Sex			
Female	23	28.8	
Male	57	71.2	
Marital status			
Single	41	51.2	
Married	28	35.0	
Separated	1	1.2	
Divorced	10	12.5	
Age (years)			40.34 (8.57)
Duration of education (years)			7.99 (4.09)
Duration of illness (years)			17.35 (8.07)
Age at onset of illness (years)			23.36 (6.92)
Number of hospitalizations			3.31 (2.70)
Family history of psychiatric disorders			
Yes	46	57.5	
No	34	42.5	
History of suicide attempt			
Yes	17	21.25	
No	63	79.75	

SD, standard deviation.

Table 2. The Clinical Features of the Patients Participating in the Study

The Clinical Features	Mean (SD)
PANNS positive syndrome	14.65 (5.35)
PANNS negative syndrome	24.66 (6.02)
PANNS general psychopathology	38.24 (8.28)
PANNS total score	77.60 (16.76)
CDSS	8.41 (5.57)

PANSS, Positive and Negative Syndrome Scale; CDSS, Calgary Depression Rating Scale for Schizophrenia; SD, standard deviation.

Of the 80 patients included in the study, 34 (42.5 %) agreed to refill the scales for test-retest reliability 4 weeks after the initial assessment. When assessing the test-retest internal reliability for PAM's 16 questions, Cronbach's alpha range from 0.738 to 0.922. Intraclass correlation coefficient values (at 95% CI) range from 0.736 (0.707-0.824) to 0.920 (0.841-0.963). Test-retest Spearman's correlation coefficients for the questions have been found between 0.347 and 0.854 (Table 4).

The PAM scores for the factors of anxiety and avoidance have been calculated by averaging the scores of the items loaded on these factors. The total score is calculated by averaging the scores from all questions. Internal consistency is evaluated using the 2 subscales, and the reliability of the overall score has been evaluated using Cronbach's alpha, which was 0.824 for the measure's anxiety subscale, 0.873 for its avoidance subscale, and 0.843 for the total score (Table 5).

To find possible relations between psychotic symptoms, depressive symptoms, and attachment, correlations between PAM, CDSS, and PANSS were evaluated.

No statistically significant correlations have been observed for PAM Anxiety scores with PANSS' positive, negative, and general dimensions, nor with PANSS' overall scores ($P > .05$). A statistically significant positive correlation has been observed between PAM Anxiety Subscale Score and CDSS Score ($r = 0.432$, $P < .001$). No statistically significant correlation exists between PAM anxiety score and AAS' scores for avoidance ($r = 0.213$; $P < .058$). A statistically significant positive correlation has been found between PAM anxiety subscale score and AAS' scores for anxiety ($r = 0.547$; $P < .001$). No statistically significant correlation exists between PAM anxiety subscale scores and AAS' secure scores ($r = -0.195$; $P = .086$) (Table 6).

No statistically significant correlation has been found for PAM's avoidance subscale scores with PANSS' positive, negative, or general dimensions, nor its overall score ($P > .05$). A statistically significant positive correlation

Table 3. Factor Structure

		Factor 1[a] (Anxiety)[2]	Factor 2[a] (Avoidance)[2]
3	I tend to get upset, anxious or angry if other people are not there when I need them.	0.683 (0.56)	0.150
5	I worry that key people in my life won't be around in the future.	0.673 (0.71)	0.046
6	I ask other people to reassure me that they care about me.	0.447 (0.45)	0.160
7	If other people disapprove of something I do, I get very upset.	0.485 (0.70)	0.082
10	I worry that if other people get to know me better, they won't like me.	0.635 (0.63)	0.123
12	I worry a lot about my relationships with other people.	0.680 (0.77)	0.057
14	I worry that if I displease other people, they won't want to know me anymore.	0.483 (0.68)	0.099
15	I worry about having to cope with problems and difficult situations on my own.	0.558 (0.77)	0.209
1	I prefer not to let other people know my 'true' thoughts and feelings.	0.101	0.433 (0.70)
2	I find it easy to depend on other people for support with problems or difficult situations.	0.078	0.597 (0.70)
4	I usually discuss my problems and concerns with other people.	0.106	0.658 (0.62)
8	I find it difficult to accept help from other people when I have problems or difficulties.	0.121	0.599 (0.57)
9	It helps to turn to other people when I'm stressed.	0.084	0.479 (0.61)
11	When I'm feeling stressed, I prefer being on my own to being in the company of other people.	0.157	0.443 (0.45)
13	I try to cope with stressful situations on my own.	0.068	0.536 (0.46)
16	I feel uncomfortable when other people want to get to know me better.	0.109	0.751 (0.62)
KMO		0.721	
Bartlett's test		371.92	
P		.0001	

Extraction method: principal component analysis.
PAM, Psychosis Attachment Measure; KMO, Kaiser–Meyer–Olkin test.
[a]Results from factor analysis of the English version of PAM.

has been found between PAM's avoidance subscale score and the CDSS score ($r=0.398$; $P<.001$). A statistically significant positive correlation has been found between PAM avoidance subscale score and AAS' avoidant score ($r=0.502$; $P<.001$). A statistically significant positive correlation has been found between PAM avoidance subscale scores and AAS' anxiety scores ($r=0.457$; $P<.001$). No statistically significant correlation has been found between PAM avoidance subscale scores and AAS' secure scores ($r=-0.074$; $P=.864$) (Table 6).

DISCUSSION

This study's aim was to assess the psychometric features of PAM's Turkish version. The outcomes from this study generally resemble the validity and reliability outcomes of the original measure developed by Berry et al.[35] as well as the German and Spanish versions.[20,35] In conclusion, the Turkish version of the Psychosis Attachment Measure has been found to be a valid and reliable measure for Turkish samples of patients with schizophrenia.

Factor analysis has been used to assess the validity of the original scale's factor structure and the distribution of items that make up the factors for a Turkish sample of schizophrenic patients. When arriving at the loading values of the items under the factors, the lowest loading value for the first factor is 0.447 and 0.433 for the second factor. No item is cross-loaded. This measure shows the structure and content of the factor structure to also be quite suitable for the Turkish version. In this study, factor loadings clustered, and each item in subscales same as the original study. Factor structure has clearly demonstrated a 2-factor solution, which is consistent with the findings from the English, German, and Spanish versions of PAM.[20,27,35] These factors are anxiety (Factor 1: items 3, 5, 6, 7, 10, 12, 14, and 15) and avoidant (Factor 2: items 1, 2, 4, 8, 9, 11, 13, and 16), just as in the original scale. The PAM scores for the factors of anxiety and avoidance have been calculated by averaging the scores of the items loaded on these factors, and the total score is calculated by averaging the scores from all questions. Internal consistency has been assessed using the 2 subscales, and total score reliability has been assessed using Cronbach's alpha. The internal consistency for each dimension is similar to that of the original scale. Cronbach's alpha value has been found as 0.82 for the dimension of anxiety, 0.87 for the dimension of avoidant,

Table 4. Test-Retest Reliability and Item Internal Consistency

		Mean (SD)	Cronbach's Alpha	Intraclass Correlation Coefficient (95% CI)	Spearman (*r*)
PAM 1	Avoidance	1.21 (1.08)	0.828	0.825 (0.654-0.913)	0.747
PAM 2	Avoidance	1.80 (0.91)	0.894	0.896 (0.791-0.948)	0.782
PAM 3	Anxiety	1.19 (0.90)	0.751	0.748 (0.695-0.874)	0.617
PAM 4	Avoidance	1.93 (0.84)	0.757	0.759 (0.617-0.832)	0.438
PAM 5	Anxiety	1.25 (1.07)	0.784	0.783 (0.629-0.892)	0.652
PAM 6	Anxiety	1.69 (1.01)	0.787	0.786 (0.672-0.843)	0.524
PAM 7	Anxiety	1.55 (0.94)	0.738	0.736 (0.707-0.824)	0.475
PAM 8	Avoidance	1.36 (0.89)	0.742	0.742 (0.682-0.851)	0.455
PAM 9	Avoidance	1.28 (0.87)	0.889	0.886 (0.771-0.943)	0.769
PAM 10	Anxiety	0.94 (0.92)	0.884	0.885 (0.772-0.943)	0.755
PAM 11	Avoidance	1.29 (1.00)	0.753	0.753 (0.705-0.873)	0.439
PAM 12	Anxiety	1.18 (1.05)	0.773	0.773 (0.645-0.887)	0.693
PAM 13	Avoidance	1.69 (1.01)	0.809	0.807 (0.714-0.904)	0.688
PAM 14	Anxiety	1.28 (0.87)	0.922	0.920 (0.841-0.963)	0.854
PAM 15	Anxiety	1.58 (0.94)	0.798	0.798 (0.696-0.899)	0.631
PAM 16	Avoidance	0.96 (0.89)	0.803	0.802 (0.703-0.901)	0.659
PAM anxiety		1.33 (0.59)	0.824	0.822 (0.744-0.911)	0.638
PAM avoidance		1.44 (0.37)	0.873	0.870 (0.739-0.935)	0.734
PAM total		1.38 (0.40)	0.843	0.842 (0.783-0.921)	0.629

PAM, Psychosis Attachment Measure; SD, standard deviation.

and 0.84 for the total score. These values were 0.82 and 0.75, respectively, in the original study.[27]

In assessing the test-retest internal consistency for the Turkish version of PAM, Cronbach's alpha values range from 0.738 to 0.922. Intraclass correlation coefficient (at 95% CI) values range from 0.736 (0.707-0.824) to 0.920 (0.841-0.963). Spearman's correlation coefficients for test-retest of the questions have been found between 0.347 and 0.854. The retest correlations for the subscales prove good retest reliability.

Afterward, we investigate the relationship of attachment styles with the clinical variables of patients with schizophrenia to show concurrent and convergent validity of the Turkish version of PAM. A significant relationship has been found for the attachment subscales with the CDSS, the AAS subscales. When examining the relationship of the scores from PAM's anxiety and avoidance subscale scores with the scores from the CDSS, a positive and weak-level correlation is seen for both subscales. Previous studies have found an association between insecure attachment and higher levels of depression in psychotic patients, but only anxious attachment has been reported by individuals to have had an independent predictive effect on depression.[20] On the other hand, Berry et al[36] found a relationship between anxious attachment and avoidant attachment with depression.Other studies also exist that have found a relationship between avoidant attachment and level of depression.[23] The findings in our study are also consistent with the literature.

AAS, which measures attachment styles in adults and is valid for a Turkish sample, has been used for its concurrent validity. A negative relationship with the secure attachment dimension of ASS and PAM's subscales and a positive relationship with insecure dimensions of ASS and PAM's subscales is expected. When we examine the relationship between PAM's subscale scores and AAS scores, a positive and weak-to-moderate correlation is found for the AAS' anxious subtype with both of PAM's subscales. No correlation has been found between the AAS' secure subtype and PAM's subscales. Also, a relationship

Table 5. Internal Consistency Reliability

	Mean (SD)	Inter-Subscale Correlation	Mean Inter-Item Correlation (r_p)	Retest Associations (r_p)	Differences *tc* (*P*)
PAM anxiety	1.33 (0.59)	0.822	0.091	0.702**	0.09 (.33)
PAM avoidance	1.44 (0.37)	0.870	0.425	0.770**	0.06 (.28)
PAM total	1.38 (0.40)	0.840	−0.068	0.728**	0.08 (.25)

PAM, Psychosis Attachment Measure; r_p, Pearson's correlation; t^c (*P*), paired *t*-test; SD, standard deviation.
**$P < .001$.

Table 6. Result of Pearson's Correlation Test for Convergent Validity

		PAM Anxiety	PAM Avoidance
PANNS positive	*r*	0.070	0.091
	P	.540	.425
PANNS negative	*r*	0.034	-0.068
	P	.767	.551
PANNS general	*r*	0.084	-0.104
	P	.457	.360
PANNS total	*r*	0.077	-0.043
	P	.495	.704
CDSS	*r*	0.432	0.398
	P	<.001	<.001
AAS: avoidance	*r*	0.213	0.502
	P	.058	<.001
AAS: anxiety	*r*	0.547	0.457
	P	<.001	<.001
AAS: secure	*r*	-0.195	-0.055
	P	.086	.864

PANSS, Positive and Negative Syndrome Scale; CDSS, Calgary Depression Rating Scale for Schizophrenia; ASS, Adult Attachment Style Scale.

between PAM's avoidance subscale and AAS' avoidance subtype has been found. Correlation between AAS anxious subtype and PAM's avoidance subtype was not an expected finding. It could be attributed to the fact that the AAS is an attachment scale used in healthy individuals, and the expressions used to determine attachment styles in healthy individuals may not be distinctive enough for individuals with psychosis.

When examining the relationship between PAM scores and PANSS scores, no significant relationship has been found. The results from studies investigating the relationship between psychotic symptoms and attachment styles are contradictory. In addition to the study that has shown no relationship to exist between secure attachment and PANSS scores, both positive and negative symptoms to be related to avoidant attachment, and only positive symptoms to be related to anxious attachment (anxious/ambivalent)[17] another study is also found a relationship to exist only between avoidant attachment and positive symptoms.[20] In another study, no relationship was found between insecure attachment and psychotic symptoms.[19] In a detailed study of the relationship between attachment styles and auditory hallucinations in patients with schizophrenia, a correlation was found for attachment anxiety with the severity of auditory hallucinations and related discomfort, while no relationship was found for avoidant attachment with these areas. However, a relationship for avoidant attachment was observed with rejecting, critical, and threatening voices.[21] In another study conducted on a healthy group, insecure attachment was shown to only predict paranoia and to have no relationship with hallucinations.[18] In another study, a relationship was found between delusions and avoidant attachment to the treatment team.[23] In addition to the relationship between anxious attachment style and PANSS' positive scores, studies reported no correlation between attachment styles and baseline clinical severity in individuals at high risk for psychosis.[37,38] However, a relationship between attachment style and improvement in psychosis during follow-up was shown.[38] Gumley et al's[15] meta-analysis found a low-to-moderate relationship for positive and negative symptoms with insecure attachment. In a recent meta-analysis, although the rate of insecure attachment was significantly higher in individuals with psychosis than in the non-clinical group (76–38%, respectively), a small but significant difference was strikingly found for the positive and negative symptoms with insecure attachment in the non-clinical sample.[39] Similar to our findings, however, this was not found in the clinical group. To clearly determine the relationship between PAM scores and psychotic symptoms, although measuring during active psychotic symptoms was considered able to provide healthier results, our sample consisted of clinically stable patients. Therefore, this condition was thought to create a limitation to clearly revealing the relationship between attachment styles and psychotic symptoms due to the remission of psychotic symptoms in most patients.

Limitations

In addition to the study's many positive results, some limitations also exist. The first is that conducting the study from a single center restricts the possibility of generalizing the data. The second is that including clinically stable individuals in the study causes difficulty in clarifying the relationship between attachment styles and psychotic symptoms, as addressed in the discussion section. The lack of a pilot study with a small sample for the clarity of translation before the research can also be noted as a limitation. Although the sample size parallels those in similar studies in the literature, studies with larger samples will yield more accurate results. Another limitation of the study is its cross-sectional design, especially in terms of examining clinical features. These findings should be supported by prospective studies. The fact that confirmatory factor analysis was not performed should be stated as a limitation. Performing confirmatory factor analysis can be recommended for similar studies in the future. As in all self-reported measures, one should take into consideration that the Turkish version of PAM has the possibility of social desirability bias. Finally, it is also a limitation that psychological variables are not evaluated in a research design with a control group.

CONCLUSION

Aside from its limitations, the findings from this study show the Turkish version of the Psychosis Attachment Measure to

be a reliable and valid measure that can easily be applied for evaluating the attachment styles of patients with schizophrenia. This study offers leading data for future studies conducted in this field.

Data Availability Statement: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Committee Approval: Ethics committee approval was received for this study Ethics Committee of Ankara Diskapi Yildirim Beyazit Training and Research Hospital (Date: May 15, 2017, Decision Number: 38/24).

Informed Consent: Informed consent was obtained from all participants who participated in this study.

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