

The Validity and Reliability of Turkish Version of Separation Anxiety Symptom Inventory and Adult Separation Anxiety Questionnaire

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SUMMARY

Aim: The aim of this study is to evaluate the validity and reliability of Separation Anxiety Symptoms Inventory (SASI) that assess childhood separation anxiety retrospectively and Adult Separation Anxiety Questionnaire (ASA).

Method: The study sample included a group of 410 participants comprised of 282 adult psychiatric outpatients with anxiety and/or major depressive disorders according to DSM-IV criteria and 128 nonpsychiatric control subjects. The presence of psychiatric disorders was determined by using the M.I.N.I. (Mini International Neuropsychiatric Interview). Structured Clinical Interview for Separation Anxiety Symptoms (SCI-SAS), Separation Anxiety Symptoms Inventory (SASI), Adult Separation Anxiety Questionnaire (ASA), Panic Disorder Severity Scale (PDSS), "Sensitivity to Separations" subscale of Panic Agoraphobic Spectrum Scale (PAS-SR), Anxiety Sensitivity Index (ASI) were also given.

Findings: The validity assessments of the instruments revealed that SASI and ASA discriminated the psychiatric patients from control subjects. Both instruments displayed high correlation with SCI-SAS and PAS-SR, a moderate correlation with ASI and PDSS. Factor structure assessments revealed the existence of 3 factor for SASI and 5 factor for ASA. Both SASI and ASA has a high level of internal consistency (Cronbach alfa coefficients are 0.89 and 0.93 respectively) and their test-retest reliability is fairly good.

Results: Turkish versions of SASI and ASA were found to be valid and reliable. Results indicate that those instruments can be used in clinical studies for surveying adult separation anxiety disorder and determining its severity.

Key Words: Adult Separation Anxiety Questionnaire, Separation Anxiety Symptoms Inventory, validity, reliability

INTRODUCTION

Separation anxiety, which is conceptualized as a childhood problem, is a type of anxiety that one feels either in the case of a separation or the expectation of a separation from his/her mother (or an attachment figure). A *Separation Anxiety Disorder* (SAD) diagnosis is made when the separation anxiety is prolonged, very severe and developmentally inappropriate, or affects functionality (American Psychiatric Association 1994). Separation anxiety is defined as a childhood-period disorder that does not last through adulthood. The diagnosis of adult SAD does not exist in DSM

and ICD classification systems (American Psychiatric Association 1994, World Health Organization 1992).

Limiting the diagnosis of SAD with age brings about two questions. The first question is whether SAD symptoms go beyond childhood and into adulthood, and secondly whether SAD symptoms could emerge in adulthood for the first time. Manicavasagar et al. (1997, 2000) have investigated these topics and concluded that childhood SAD could proceed through adulthood. Furthermore, some other researchers have shown that separation anxiety could be seen in adulthood, even more commonly than expected

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(Ollendick et al. 1993, Fagiolini et al. 1998, Mayseless et al. 2000). However, the most remarkable limitation of these studies was that they were not designed prospectively and were not conducted long enough to observe the beginning of a relationship formation, which is an indicator of adulthood attachment behavior.

Some researchers have proposed that adult separation anxiety could present itself for the first time in adulthood independently of a history of childhood SAD, and studies that have been conducted support this suggestion (Manicavasagar et al. 2000, Cyranowski et al. 2002, Foley et al. 2004). In an epidemiologic study, (N = 9.282) Shear et al. (2006) detected that the life time prevalence of adult SAD was 6.6 % by using a clinical interview adapted from childhood separation anxiety symptoms into adulthood. This rate was found to be quite high, and therefore the authors have suggested that adult SAD should exist in a DSM classification system.

In order to evaluate separation anxiety, Silove et al. (1993) developed "Separation Anxiety Symptom Inventory" (SASI) which is a 15 item inventory assessing childhood separation anxiety symptoms for adults. Later, Manicavasagar et al., (2003) developed "Adult Separation Anxiety Checklist" (ASA), a 27 item, self-rated checklist evaluating separation anxiety symptoms in adulthood. These tools, having good psychometric properties, have been used in many studies since then.

In the present study, the validity and reliability of the Turkish form of SASI and ASA, which detect the presence and severity of separation anxiety symptoms in adulthood, were evaluated in adult patients and healthy controls.

MATERIALS AND METHODS

The Turkish translations of SASI and ASA were made separately by three academic staff with advanced levels of English. The Turkish translations were then retranslated into English by another staff member, blinded to the original texts, and then compared to the original papers. The items that did not exactly fulfill the original meaning were reviewed and the final Turkish forms were produced. For the present study, ethical approval was obtained from the Dokuz Eylul University Faculty of Medicine, Clinical and Laboratory Investigations' Ethical Committee.

Study Design

The patient group included 282 patients who had consulted to the Dokuz Eylul University Psychiatry Department's outpatient clinic between September 2008 and April 2009. The healthy control group included 128 volunteered subjects consisting of patients' relatives, students, and health care

professionals. All participants were between 18 – 65 years old. The initial evaluation of the patients was done according to DSM-IV criteria. The patients that fulfilled the criteria and were approved to participate were included in the study and final confirmations of their diagnoses were carried out by the Turkish version of M.I.N.I. (Mini International Neuropsychiatric Interview, version 5.0.0). The healthy control group was composed of subjects who had no present psychiatric disorder according to the M.I.N.I. interview. The childhood and adulthood subscales of "Structured Clinical Interview for Separation Anxiety Symptoms" (SCI-SAS) were applied to all participants. While evaluating the subjects with SCI-SAS, 16 participants in the healthy control group were recognized as having adult SAD, and were subsequently placed into the patient group. Thus the primary diagnoses of the patients included in the study were panic disorder with or without agoraphobia (N=58, 14.2%), social anxiety disorder (N=32, 7.8%), obsessive compulsive disorder (N=37, 9.0%), post traumatic stress disorder (N=6, 1.5%), generalized anxiety disorder (N=55, 13.4%), anxiety disorder NOS (N=8, 2.0%) and major depressive disorder (N=70, 17.1%). A total of 410 subjects were assessed in the study. Patients with an anxiety disorder secondary to substance abuse, medical conditions, a history of manic episodes, psychosis, or a cognitive deficit were excluded from the study.

After the demographic data were collected, all subjects were given self report questionnaires. For the patients with a panic disorder, an additional interview was made using the Panic Disorder Severity Scale (PDSS). The self report tests required for subjects to complete were the Adult Separation Anxiety Questionnaire (ASA), the Separation Anxiety Symptom Inventory (SASI), the "separation sensitivity subscale" of the Panic-Agoraphobic Spectrum Scale (PAS-SR) for lifetime, and the Anxiety Sensitivity Index (ASI). All measurements took approximately 1 to 2 hours to complete.

The subjects from the patient group (N=80) who agreed to participate in a second interview for retests were evaluated 7 – 21 days after the first assessment. In the second assessment, the patients were again instructed to complete all scales and questionnaires, except for the M.I.N.I. interview.

Assessment Tools

The assessment instruments used in the study for both diagnosis and in determining the validity and reliability of ASA and SASI were as follows:

1- Mini International Neuropsychiatric Interview–version 5.0.0 (M.I.N.I.): The M.I.N.I. interview was first developed by Sheehan et al. (1998) as a structured interview in order to evaluate main axis I psychiatric disorders present in DSM-IV and ICD-10. In the present study, the Turkish version 5.0.0 was used.

2- Structured Clinical Interview for Separation Anxiety Symptoms (SCI-SAS): This interview was developed by Cyranowski et al. (2002) in order to assess adult separation anxiety symptoms by adapting childhood SAD symptoms to adulthood. SCI-SAS is composed of two parts, both of which include 8 items. The first part retrospectively evaluates childhood separation anxiety symptoms, while the second part evaluates current adulthood symptoms. The presence of 3 out of 8 symptoms is sufficient for the diagnosis of either childhood or adult SAD. SCI-SAS was translated into Turkish and the psychometric studies were done. The Cronbach's Alpha value of the childhood part and the adulthood part of SCI-SAS are 0.56 and 0.57 respectively, and internal consistency between the items of the scale is of a moderate level. The test/retest and the inter-rater reliability scores are quite high ($r=0.81$, $p<0.001$ and Cohen's Kappa between 0.62 and 0.95, $p<0.001$; respectively) (Diriöz, 2010).

3- Panic Disorder Severity Scale (PDSS): This self-report scale is made up of 7 items and was used in the study to evaluate the convergent validity. The items of the scale assess the severity of panic symptoms and the disability that occurs as a result. PDSS items are 5 point Likert type questions ranging from 0 to 5. The psychometric properties are good and the test is sensitive to changes in improvement (Shear et al. 1997). The test was adapted into Turkish by Monkul et al. (2004).

4- Separation Anxiety Symptom Inventory (SASI): The SASI was developed by Silove et al. (1993). SASI is a self-report inventory consisting of 15 items with 4 point Likert type questions. Each item retrospectively assesses the symptoms of separation anxiety in adults, possibly experienced in childhood, and ranges between 0 ("I never had this feeling") and 3 ("This feeling occurred very often").

5- Adult Separation Anxiety Questionnaire (ASA): This is also a self report questionnaire developed by Manicavasagar et al. (2003) evaluating adulthood separation anxiety symptoms and it includes 27 items. The items in the questionnaire are 4 point Likert type questions where 0 indicates "this has never happened" and 3 indicates "this happens very often". The validity and reliability study of ASA in Turkish was carried out in a small sample and has not yet been published (Alkan, 2007).

6- Panic-Agoraphobic Spectrum Scale, Lifetime (PAS-SR): This scale assesses symptoms related to panic and agoraphobia spectra (Cassano et al. 1999). The scale is composed of 8 subscales and 114 items responded to either as "yes" or "no" according to the presence or absence of a particular symptom. The scale has been adapted into Turkish and the validity and reliability study of the scale was completed (Onur et al. 2006). In the present study the

"Separation Sensitivity" subscale of PAS-SR contained 15 items and reflected the measure of separation anxiety.

7- Anxiety Sensitivity Index (ASI): This index was first developed by Reiss et al. (1986) to evaluate anxiety sensitivity. ASI measures one's beliefs concerning the consequences of anxiety symptoms. It is composed of 16 items with a 5 point Likert type scale and the ratings range from 0 ("absent") to 4 ("very much"). The validity and reliability of ASI in Turkish has been determined (Ayvaşık, 2000).

Statistical Analysis

The statistical analysis of the data obtained was evaluated using SPSS for Windows (version 15.0) program. In the analysis of socio-demographic data, the t-test for independent samples and Chi-square tests were used. The t-test for independent samples was used for the discriminating validity procedure of the scales. In order to evaluate the construct validity of SASI and ASA, the scores of both tests were compared to other tests' scores via a Pearson correlation coefficient. For criterion dependent validity, a Receiver Operation Characteristic (ROC) analysis curve was used to detect the possible cut-off points of the scores obtained from the scales. In order to detect the adequacy of the sample size for factor analysis, the Kaiser-Meyer-Olkin (KMO) test was utilized. The Barlett test was carried out to examine the correlations between the variables. For determination of the factorial structure of the scales, the Principle Components Analysis was used with "Kaiser Normalization" and "Varimax Rotation" to the data. While obtaining the factors, values with eigenvalue statistics greater than 1 were accepted as significant. In reliability analysis, internal consistency was evaluated using the Cronbach's Alpha coefficient, and for test/retest reliability the Pearson correlation coefficient and paired samples t-test were used.

Findings

The patient and the control groups were not statistically different from each other in terms of gender, age, education and marital status. The patient and control groups were statistically different in regards to occupational status. In the patient group, rates of unemployed, retired and house wife categories were higher than that in the control group. The socio-demographic findings of the whole sample are presented in Table 1.

1) The validity measures of SASI

Since the score distribution had shown a skewed trend through positive deviation in the original SASI development study, the normal distribution was achieved by applying the "square root transformation" to the raw total

scores obtained from the scale. Therefore the authors recommended to use these normalized scores (e.g. 4 instead of 16) in parametric analyses (Silove et al. 1993). The sample distribution was controlled in this study and a similar statistically significant skewness was observed in this sample as well. *Thus, the raw total scores obtained from the Turkish version of SASI should be used by applying square root transformation.*

Table 1. The Socio-demographic Features of the Patient and Control Groups

	PATIENT GROUP		CONTROL GROUP		
	N	%	N	%	
GENDER					
Female	222	78.7	102	79.7	$X^2=0.049$ $p=0.896$
Male	60	21.3	26	20.3	
MARITAL STATUS					
Married	171	60.6	74	57.8	$X^2=0.344$ $p=0.842$
Single	82	29.1	39	30.5	
Widowed	29	10.3	15	11.7	
OCCUPATIONAL STATUS					
Unoccupied	24	8.5	3	2.3	$X^2=44.27$ $p<0.001$
Occupied	102	36.2	88	68.8	
House Wife	91	32.3	15	11.7	
Student	29	10.3	15	11.7	
Retired	36	12.8	7	5.5	
MEAN AGE	36.7		36.3		$t=-.352$ $p=0.725$
(Standard Deviation)	(11.1)		(11.1)		
EDUCATION LEVEL (in years)(Standard Deviation)	10.8 (4.5)		11.5 (4.2)		$t=1.572$ $p=0.117$

Discriminative Validity: The total scores of SASI were found to be higher in the patient group (mean score=3.08, sd=1.38) than in the control group (mean score=2.15, sd=1.24). Hence, SASI was able to differentiate the patients from the control group subjects ($t=-6.53$, $df=408$, $p<0.001$).

Convergent Validity: SCI-SAS, ASA, PAS-SR and ASI were used for the measure of convergent validity for SASI. For the discriminative validity measure, PDSS was used. In the Pearson correlation analysis, positive significant correlations were detected between SASI scores and SCI-SAS, ASA, PAS-SR and ASI scores. However, the level of correlation between SASI and PDSS was weak. As expected,

the highest correlation was detected between SASI and the childhood subscale of SCI-SAS in this study (Table.2).

Construct Validity–Factor Analysis: The Explanatory Factor Analysis technique was used to evaluate construct validity of SASI. The KMO value for the whole sample was calculated and found to be 0.88 for SASI. The data cluster was determined to be appropriate for factor analysis by Barlett test ($p<0.001$). The Varimax Rotation procedure revealed that some items had the highest points and, accordingly, were grouped under certain factors as follows: items 3, 6, 7, 8, 11, 13 and 15 were grouped under factor 1 (separation anxiety); items 2, 5, 9, 10 and 12 were grouped under factor 2 (fear of harm befalling family members); and items 1, 4 and 14 were grouped under factor 3 (school phobia) (Table 3). In the analysis, the first factor alone accounted for 40.63 % of the variance, and the first and second factors together accounted for 50.67 % of the variance. Finally, the three factored structure contributed to 59.43 % of the total variance.

2) The Reliability Measures of SASI

Internal Consistency: The Cronbach's Alpha value of the SASI was 0.89 from the data obtained from 410 subjects.

Item Analysis: The Item Total Correlation procedure was used for item analysis. The item-total correlation of the scale's items was found to range between 0.43 and 0.65 (Table 4).

Test-Retest Reliability: For this procedure, some subjects ($N=80$) were evaluated 7-21 days after the first assessment. The mean scores were 2.91 (sd=1.37) in the first assessment, and 2.92 (sd=1.43) in the retest. There was no statistically significant difference between the two assessments ($t=-115$, $df=79$, $p=0.91$). Moreover, the level of correlation between both assessments was found to be high ($r=0.91$, $p<0.001$).

ROC Analysis: The sensitivity and specificity were detected as 83% and 76% respectively, and the cut-off point (as raw scores) was determined to be "12 points" for SASI.

Table 2. The Correlation Coefficients of the Scales

	SCI-SAS (Childhood)	SCI-SAS (Adulthood)	SASI	ASA	PAS-SR	ASI	PDSS
SCI-SAS (Childhood)	1						
SCI-SAS (Adulthood)	.567(*)	1					
SASI	.687(*)	.516(*)	1				
ASA	.563(*)	.724(*)	.670(*)	1			
PAS-SR	.600(*)	.666(*)	.647(*)	.794(*)	1		
ASI	.453(*)	.546(*)	.575(*)	.672(*)	.631(*)	1	
PDSS	.102	.353(*)	.263(**)	.480(*)	.363(*)	.397(*)	1

* $p<0.001$, ** $p<0.01$; $N=410$, for PDSS $N=58$

Table 3. The Item Distribution of SASI

Factor Name	Separation Anxiety	Inability of becoming apart from family members	School Phobia
Eigenvalue:	6.050	1.547	1.352
Percent of Variance (%)	40.331	10.315	9.013
SASI Item 1	.13	-.02	.83
SASI Item 2	.17	.83	-.02
SASI Item 3	.68	.26	.17
SASI Item 4	.18	.19	.74
SASI Item 5	.14	.84	-.02
SASI Item 6	.60	.21	.11
SASI Item 7	.65	.19	.30
SASI Item 8	.69	.23	.11
SASI Item 9	.36	.50	.02
SASI Item 10	.35	.60	.19
SASI Item 11	.62	.38	-.02
SASI Item 12	.16	.62	.27
SASI Item 13	.77	.11	.18
SASI Item 14	.30	.14	.77
SASI Item 15	.77	-.02	.21

Table 4. The Item Total Score Correlation of SASI

	Corrected Item Total Score Correlation	Alpha value (if item deleted)
SASI 1	0.43	0.89
SASI 2	0.55	0.88
SASI 3	0.65	0.88
SASI 4	0.48	0.89
SASI 5	0.53	0.88
SASI 6	0.53	0.88
SASI 7	0.64	0.88
SASI 8	0.60	0.88
SASI 9	0.50	0.88
SASI 10	0.60	0.88
SASI 11	0.61	0.88
SASI 12	0.51	0.88
SASI 13	0.63	0.88
SASI 14	0.55	0.86
SASI 15	0.62	0.88

3) The Validity Measures of ASA

Discriminative Validity: The mean ASA scores were determined to be significantly higher ($t=-9.45$, $df=408$, $p<0.001$) in the patient group (mean score=29.19, $sd=16.12$) than in the control group (mean score=14.55, $sd=10.14$). Thus, it was determined that the scale was able to differentiate the patients from the controls.

Convergent Validity and Discriminative Validity: For the convergent validity of ASA, SCI-SAS, SASI, PAS-SR and ASI scales, and for the discriminant validity of ASA, the PDSS scale was used. Following Pearson correlation analysis, a strong correlation was detected between ASA scores and SCI-SAS, SASI, PAS-SR and ASI scores. However, the correlation level between ASA scores and PDSS scores was found to be low. The strongest correlation between ASA and all other scales used in the study was with the childhood subscale of SCI-SAS (Table 2).

Construct Validity-Factor Analysis: The Explanatory Factor Analysis technique was used to evaluate the construct validity of ASA. The KMO value for the whole sample was found to be 0.93 for ASA. The data cluster was determined to be appropriate for factor analysis by the Barlett test ($p<0.001$ for the scale). The Principle Components Analysis generated 5 factors with eigenvalues greater than 1 (Table.5). However, many of the factors detected were found to load positively on the first factor. The first factor accounted for 40% of the variance alone, but other factors contributed between 3% and 6% themselves. The 5 factor structure could have explained for 59.78% of the total variance.

Another procedure used in calculating the factor number was the Scree Test graphics. In this procedure, the number

up to the horizontal level of the graph was accepted as the factor number. For ASA, the orthogonal rotation of the 5-factor solution failed to strengthen the loadings on any additional dimensions, except for the first factor. All items continued to load strongly on the first rotated factor.

Table 5. The Item Distribution of ASA

Factor Name	Separation Anxiety				
Eigenvalue:	10.428	1.736	1.326	1.264	1.056
Percent of Variance (%)	38.621	6.431	4.910	4.863	3.911
ASA-Item 1	.12	.38	.49	-.02	.40
ASA-Item 2	.22	.64	.29	-.03	.15
ASA-Item 3	-.02	.60	-.02	.00	.17
ASA-Item 4	.24	.70	.25	-.02	.13
ASA-Item 5	.39	.45	.17	.38	-.03
ASA-Item 6	.44	.57	.18	.18	.21
ASA-Item 7	-.02	.50	-.02	.35	.36
ASA-Item 8	.46	.32	.26	.28	.22
ASA-Item 9	.43	.45	-.01	.31	-.17
ASA-Item 10	.18	.30	.11	.74	-.02
ASA-Item 11	.42	.29	.33	.17	.27
ASA-Item 12	.16	.32	.74	-.02	.10
ASA-Item 13	.21	.17	.75	-.02	-.02
ASA-Item 14	.50	.40	.35	.15	.31
ASA-Item 15	.38	.54	.20	.20	-.20
ASA-Item 16	.41	.30	.30	-.02	.42
ASA-Item 17	.13	.11	-.01	-.02	.68
ASA-Item 18	.62	.14	.28	.18	.31
ASA-Item 19	.18	-.00	.71	.11	.10
ASA-Item 20	.17	.19	.75	.11	.10
ASA-Item 21	.80	.19	.15	-.02	-.00
ASA-Item 22	.47	.17	.30	.18	.30
ASA-Item 23	.61	.18	.28	.18	.31
ASA-Item 24	.86	.17	.13	-.02	-.02
ASA-Item 25	.50	.16	.23	.33	.33
ASA-Item 26	-.02	-.02	.18	.80	.11
ASA-Item 27	.52	.12	-.02	.52	.10

4) The Reliability Measures of ASA

Internal Consistency: The Cronbach's Alpha value of ASA was found to be 0.93.

Item analysis: The Item Total correlations of the scale's items ranged between 0.29 and 0.76 (Table 6). The exclusion of any item did not change the Cronbach's Alpha value.

Table 6. The Item-Total Score Correlation of ASA

	Corrected Item Total Score Correlation	Alpha value (if item deleted)
ASA 1	0.58	0.93
ASA 2	0.60	0.92
ASA 3	0.40	0.93
ASA 4	0.64	0.92
ASA 5	0.63	0.92
ASA 6	0.71	0.92
ASA 7	0.52	0.93
ASA 8	0.67	0.92
ASA 9	0.49	0.93
ASA 10	0.52	0.93
ASA 11	0.65	0.92
ASA 12	0.59	0.92
ASA 13	0.56	0.93
ASA 14	0.76	0.92
ASA 15	0.56	0.93
ASA 16	0.65	0.92
ASA 17	0.29	0.94
ASA 18	0.67	0.92
ASA 19	0.43	0.93
ASA 20	0.58	0.93
ASA 21	0.60	0.92
ASA 22	0.62	0.92
ASA 23	0.69	0.92
ASA 24	0.65	0.92
ASA 25	0.65	0.92
ASA 26	0.41	0.92
ASA 27	0.57	0.92

Test-Retest Reliability: In the study, 80 patients were reevaluated for the second time. The mean score the patients had in the first assessment was 28.43 (sd=15.50) and 27.78 (sd=15.23) in the retest. Both assessments' mean scores were not significantly different from each other ($t=1.02$, $df=79$, $p=0.307$). The correlation value between the two assessments was high ($r=0.93$, $p<0.001$).

ROC Analysis: When the cut-off point was taken as 24.5, the sensitivity and the specificity of ASA were found to be 85% and 75% respectively. However, the sensitivity was 81% and the specificity was 79% when the cut off point was taken as 26.5. Thus the cut-off point was determined as "25 points" for ASA.

DISCUSSION

In the present study, both "Separation Anxiety Symptom Inventory" and "Adult Separation Anxiety Questionnaire" were adapted into Turkish and shown to be valid and reliable measurement tools. The difference in demographic data (occupational status) between the groups did not create a problem since the study was carried out with a rather large sample size.

Psychometric Properties of SASI

The discriminative validity of a scale means that it is capable of differentiating patients from healthy subjects (Baydur and Eser, 2006). In this study, it was detected that SASI had a high level of construct validity, and differentiated patients from control subjects in terms of mean scores. In convergent validity, SCI-SAS, ASA, separation sensitivity subscale of PAS-SR, PDSS and ASI were used. The strongest correlation was found between "SASI," which assessed separation symptoms retrospectively and "Childhood subscale of SCI-SAS," which diagnosed childhood SAD, as expected. Likewise, high levels of correlations were found between ASA, PAS-SR, SCI-SAS (adulthood subscale), ASI and SASI. A significant yet weak correlation was detected between SASI and PDSS. In other words, there was a low level relationship between panic disorder symptoms experienced in adulthood and separation anxiety symptoms experienced in childhood as evaluated by SASI. Therefore, this level of relation does not support a phenomenological overlap between childhood SAD and adulthood panic disorder, but still indicates that they are connected to each other somehow. This connection supports the discriminative validity of the scale.

Principle Components Analysis generated 3 factors accounting for 59.43% of the total variance for SASI. While separation anxiety symptoms loaded on factor 1, symptoms related to befalling family members loaded on factor 2 and school phobia symptoms on the factor 3. On the other hand, Silove et al (1993) detected 4 factors accounting for 57 % of the total variance in their study. In that study, the items assessing separation anxiety (items 3, 7, 8, 9, 11 and 13) loaded on factor 1. Since the investigators from the present study determined that the 6th and 15th items were in addition to the other items loaded on factor 1, it was named "*Separation Anxiety*". Similar to original study, items 1, 4 and 14 assessing "*School Phobia*" also loaded on factor 3 in the present study. The other items were determined to be loaded on two separate factors in the original study, named "distress at being away from a secure base" and "fear of harm befalling family members" (Silove et al., 1993). We detected that these items loaded on a single factor that was named "*inability of becoming apart from family members*". The data obtained have supported the construct validity of the scale.

In the present study Cronbach's Alpha value was detected as 0.89 indicating the internal consistency coefficient of SASI. However, in the original study Cronbach's Alpha value was determined to be 0.80 by Silove et al. (1993). Considering the value obtained in the present study, it was concluded that the Turkish version of the scale possessed a good internal consistency and high level of reliability.

When the correlations between the separate items in the scale and the total score were evaluated, the first item of the "School Phobia" part was detected to have the lowest coefficient and the other items ranged between 0.48 and 0.65. However, all of the items were above the correlation value of 0.20 which indicated fair consistency. In other words, each item was determined to have good consistency with the whole scale and thus the reliability of the scale had been supported. Therefore with this instrument, the subjects that had 12 points or more in terms of raw points (or 4 or more in terms of square root transformation), could be considered to have childhood SAD diagnoses.

We found that SASI had a significant correlation value considering the test-retest reliability was as high as $r=0.90$, which was close to the value found in the original study ($r=0.89$) by Silove et al. (1993). On the other hand, no significant difference was seen between the mean scores. Finally, with the findings of the present study, the evaluation of childhood separation anxiety symptoms with SASI was concluded to present good consistency over time.

Psychometric Properties of ASA

The patient and the control groups differed significantly from each other in terms of ASA scores (mean scores = 29.19 ± 16.12 and 14.55 ± 10.14 , respectively). In the original development study of ASA by Manicavasagar et al. (2003), the scores of the patients with adult SAD were approximately three times higher than those in the control group (37.8 vs. 14.2). It was also found in the present study that ASA could differentiate patients from the controls according to the mean scores and that the scale had a high discriminant validity.

The correlation between the ASA total scores and the total scores of SCI-SAS, SASI, separation sensitivity subscale of PAS-SR, PDSS and ASI were evaluated in order to determine the convergent validity and the discriminant validity of ASA. The "Separation Sensitivity" subscale of PAS-SR assessed separation sensitivity and separation anxiety as ASA. Thus, the strongest correlations with ASA were found between ASA and SCI-SAS (adulthood subscale) and PAS-SR. Moreover, high and significant correlations were also detected between ASA and SCI-SAS (childhood subscale), SASI and ASI as well. In another study of validity and reliability of ASA carried out in Turkey (Alkan,

2007), the coefficient of the correlation between ASA and the separation sensitivity subscale of PAS-SR was found to be statistically significant ($r=0.73$, $p<0.001$). These findings may support the convergent validity of the scale. The weakest correlation was found with PDSS and such low levels of correlation between the two scales supported the discriminative validity of ASA.

In the Principle Components Analysis, five factors were generated accounting for 59.78 % of the total variance. However, most of the factors detected had loaded strongly on the first factor. The first factor alone accounted for 40 % of the variance, and the remaining factors had very small contributions. The orthogonal rotation of the five-factor solution failed to strengthen the loadings on to the additional dimensions, which was also supported by the visually inspected Scree test graphs. All items loaded strongly on the first rotated factor. On the other hand, Manicavasagar et al (2003) also found five-factor structure in the original study, and all of the items had positively loaded on the first factor as in the present study. In the Manicavasagar's study, the first factor had accounted for 45% of the variance by itself and the remaining factors contributed between 4 to 6% to the variance. Quite similarly, the orthogonal rotation of the five-factor solution had failed to strengthen the loadings on the additional dimensions, and all of the items had continued to load on the first rotated factor. It was an important finding for the present study to obtain a factor structure that was almost identical as the original study. Finally, all of the parameters determined as findings showed ASA as a valid scale.

The internal consistency reliability coefficient, Cronbach's Alpha value, was found to be 0.93. This value was reported as 0.88 by Alkan (unpublished data, 2007) in a Turkish sample and 0.95 by Manicavasagar et al. (2003). The reliability coefficient detected in the present study was a high value and indicated a good internal consistency and a high level of reliability. When correlations of the scale items with total score were assessed, the correlation value representing the consistency was above 0.20 and all of the items' item-total score correlations ranged between 0.40–0.76 except for item 17. The consistency of items with the whole scale was considerably good.

The evaluation of the test-retest reliability of ASA was carried out by the test-retest correlation of the total scores obtained from the scale and found to be $r=0.93$ which was a high value. This value was very similar to that ($r=0.86$, $p<0.001$) found in the original study (Manicavasagar et al. 2003). Furthermore, there was no statistical difference between the two assessments of the patients. Therefore it was concluded that in spite of the time factor, the different evaluations of adult SAD with ASA were consistent with each other. Thus the probability of subjects assessed by

ASA with scores of 25 or higher that fulfill SAD diagnostic criteria would be high.

There are some limitations of the study. Firstly, there was no gold standard Turkish scale that could have been used in the validity assessment of separation anxiety. For this reason, the investigators used the appropriate subscale of PAS-SR. Secondly the number of the patients with a primary diagnosis of SAD was low; however the patients SAD with other comorbid disorders compensated for this limitation to some extent.

CONCLUSION

In this study, SASI was determined to be a valid and reliable measurement tool in assessing the presence of childhood separation anxiety symptoms in adults. This self-report

scale, which took as little as 5 minutes to complete, could detect separation anxiety symptoms that a patient may have experienced in childhood and determine the symptoms' severity. ASA, on the other hand, was proven to be a valid and reliable measurement tool in assessing separation anxiety symptoms in adulthood. This scale evaluated the presence and severity of separation anxiety symptoms, whether they first began during adulthood or during childhood, and continued through adulthood. The scale had also been adapted into Turkish, which was based on self-report questions and took approximately 10 to 15 minutes to complete. The investigators believe that by these two measurement tools, further data could be obtained that may illuminate the nature of a new anxiety disorder which has not been studied thoroughly and does not exist in current classification systems.

REFERENCES

- Alkan M. (2007) Duygudurum ve anksiyete bozukluklarında panik-agorafobik spectrumun ve erişkin ayrılma anksiyetesinin komorbiditesi ve etkileri. Unpublished PhD Thesis. Ege University, Institute of Social Sciences, Psychology Department, İzmir.
- American Psychiatric Association (1994) DSM-IV - Diagnostic and Statistical Manual of Mental Disorders – 4th Ed. American Psychiatric Association, Washington DC.
- Ayvaşık HB (2000) Kaygı Duyarlılığı İndeksi: Geçerlilik ve güvenirlik çalışması. Türk Psikoloji Dergisi, 15: 43-57.
- Baydur H, Eser E (2006) Uygulama: yaşam kalitesi ölçeklerinin psikometrik çözümlenmesi. Sağlıkta Birlik, 1: 99-123.
- Cassano GB, Banti S, Mauri M, et al. (1999) The Internal Consistency and Discriminative Validity of the Structured Clinical Interview for Panic-Agoraphobic Spectrum (SCI-PAS). Int J Methods Psychiatr Res, 8: 138-145.
- Cyrankowski JM, Shear MK, Rucci P, et al. (2002) Adult Separation Anxiety: Psychometric properties of a new structured clinical interview. J Psychiatr Res, 36: 77-86.
- Diriöz M (2010) Ayrılma Anksiyetesi için Yapılandırılmış Klinik Görüşme, Çocukluk ve Yetişkin Ayrılma Anksiyetesi Ölçekleri'nin Geçerlilik Ve Güvenirliği. Unpublished Master Thesis. Dokuz Eylül University, Institute of Health Sciences, Neuroscience Department, İzmir.
- World Health Organisation (1992) ICD-10 Classification of Mental and Behavioural Disorders. World Health Organisation, Geneva.
- Fagioli A, Shear MK, Cassano GB, et al. (1998) Is life time separation anxiety a manifestation of panic spectrum? CNS Spectr, 3: 63-72.
- Manicavasagar V, Silove D, Curtis J (1997) Separation anxiety in adulthood: A phenomenological investigation. Compr Psychiatry, 38: 274-282.
- Manicavasagar V, Silove D, Curtis J, et al. (2000) Continuities of separation anxiety from early life into adulthood. J Anxiety Disord, 14: 1-18.
- Manicavasagar V, Silove D, Wagner R (2003) A self-report questionnaire for measuring separation anxiety in adulthood. Compr Psychiatry 44: 146-153.
- Mayseless O, Scher A (2000) Mother's attachment concerns regarding spouse and infant's temperament as modulators of maternal separation anxiety. J Child Psychol Psychiatry Allied Discip, 41: 917-925.
- Monkul ES, Tural U, Onur E, et al. (2004) Panic disorder severity scale: reliability and validity of the Turkish version. Depress Anxiety, 20: 8-16.
- Ollendick TH, Lease CA, Cooper C (1993) Separation anxiety in young adults: A preliminary examination. J Anxiety Disord, 7: 293-305.
- Onur E, Alkın T, Monkul ES, et al. (2006) Yaşam Boyu Panik-Agorafobik Spektrum Ölçeği Öz Bildirim Formunun (PASÖ-ÖB) Türkçe Versiyonu Geçerlilik ve Güvenirlik Çalışması. Yeni Symposium, 44: 81-91.
- Reiss S, Peterson RA, Gursky DM, et al. (1986) Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. Behav Res Ther, 24: 1-8.
- Shear MK, Brown TA, Barlow DH, et al. (1997) Multicenter collaborative panic disorder severity scale. Am J Psychiatry, 154: 1571-1575.
- Shear MK, Jin R, Ruscio AM, et al. (2006) Prevalence and correlates of estimated DSM-IV child and adult separation anxiety disorder in the National Comorbidity Survey Replication. Am J Psychiatry, 163: 1074-1083.
- Sheehan DV, Lecrubier Y, Sheehan KH, et al. (1998) The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry, 59 (Suppl 20): 22-33.
- Silove D, Manicavasagar V, O'Connell D, et al. (1993) The development of the Separation Anxiety Symptom Inventory (SASI). Aust NZ J Psychiatry, 273: 477-488.