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RELIABILITY AND VALIDITY STUDY OF THE TURKISH VERSION OF HYPOMANIA CHECKLIST-32-REVISED

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RELIABILITY AND VALIDITY STUDY OF THE TURKISH VERSION OF HYPOMANIA CHECKLIST-32-REVISED

SUMMARY

Objective: In this study, it is aimed to evaluate the reliability and validity of the Turkish version of Hypomania Checklist-32-Revised.

Method: The study was carried out with 80 patients diagnosed with bipolar I disorder, 26 patients diagnosed with bipolar II disorder and 42 patients diagnosed with major depressive disorder attending the out- and in-patient psychiatry departments of three university hospitals and one training hospital, and 116 healthy volunteers consisting of university students. Mean duration of illness was 15,1 years for the bipolar disorder group, and 9,3 years for the major depressive disorder group. For concurrent validity, Mood Disorder Questionnaire was used. In the statistical analysis, internal consistency coefficient, item-total score correlation coefficients, exploratory factor analysis, correlation with concurrent scale and ROC curve were calculated.

Results: Translation into Turkish and back-translation into English of Hypomania Checklist-32-Revised were performed and thus the semantic harmony of the scale was obtained. In the internal consistency, Cronbach alpha coefficient was 0,914 and item-total score correlations were between 0,235-0.743. Solely the coefficient of item #23 was found as 0,110. In factor analysis, six factors were obtained but a two-factor solution representing 44,5% of the total variance was accepted and first factor represents overactivity and being expansive, second factor represents impulsivity and risky behaviors. Correlation of Hypomania Checklist-32-R with Mood Disorder Questionnaire was r=0,379. In the ROC analysis, the cut off point of the scale was calculated as 14 with a sensitivity of 71,0 and specificity of 69,8. The scale discriminates well between the bipolar group, and depressive and control groups.

Conclusion: Hypomania Checklist-32-Revised developed for screening hypomania is reported to be reliable and valid in Turkish after cutting out item #23.

Key words: Hypomania Checklist-32-Revised, reliability, validity

INTRODUCTION
Due to misdiagnosis, a majority of patients with bipolar disorder have a delay in receiving effective treatment (Carta ve Angst 2005). One of the reasons is that the illness often starts with depressive episode, however for the diagnosis a manic episode is needed (Berk et al. 2007). Another reason is that patients cannot clearly remember and inform about their past hypomanic, and even mild manic episodes (Angts et al. 2005). Limitations of the previous formal classifications due to their categoric and slightly rigorous approach in terms of both symptom content and hierarchy and minimum duration required (Angst et al. 2003, Akiskal ve Benazzi 2005, Benazzi 2007) are acknowledged widely, and they are trying to be overcome with new classifications such as DSM-5. Even though these limitations are put aside, especially some difficulties in the retrospective diagnosis of hypomania, trying to overcome these difficultes and contributions towards the accurate diagnosis for the patients to reach optimal treatment as early as possible are among the important efforts nowadays. Development of mood symptoms screening scales are efforts for this purpose.

Mood Disorder Questionnaire, as one of the scales, is developed by Hirschfeld et al. (2000) and the Turkish translation and adaptation was validated by Konuk et al. (2007). Even though Mood Disorder Questionnaire is developed to cover this unmet need, it is suggested that its sensitivity is not satisfactory especially for hypomania (Zimmerman et al. 2004, Benazzi 2003). Angst et al. (2005) have prepared Hypomania Checklist – 32 in order to develop a more sensitive scale for rating bipolar disorder type I as well as bipolar disorder type II. Hypomania Checklist – 32 is a self-rated instrument with 32 items. First, there is a 7-point Likert type item rating mood in general, and then there are 32 items with yes-no answers evaluating mood symptoms of the individual in two domains namely *"risk-taking/irritable"* and *"active/elated"*. It is found that the sensitivity of the scale is quite high, but the specificity in terms of discriminating hypomania from mania is somewhat low (Angst et al. 2005, Vieta et al. 2007). The scale is validated into German, Italian, Swedish, French, Spanish, and Chinese. Since the scale is self-rated, has dichotomous answers and has a relatively high sensitivity, it arouses interest.
The aim of the study is to show reliability and validity of the Turkish form of the Hypomania Checklist – 32 – Revised.

METHOD

Translation Procedure
The translation of the scale was performed by five experienced psychiatrists. After the this translated form was controlled and accepted, to test the comprehensibility of the items of the scale, 10 patients were asked to read the scale and to inform whether the statements represent their mood and they are comprehensible. Subsequently, it is back-translated into English by one linguist and two mental health professionals. This back-translated form was evaluated by the developer of the scale, Jules Angst. The final version of the Turkish form was generated after the approval.

Subjects
For the study subjects, patients who were under treatment in specialized clinics and who were in remission at the time of assessment were included in the study. Diagnosis of the patients were made according to DSM-IV (APA 1994) by the coordinator of the specialized mood disorder clinics. The remission state was confirmed by a 17-item Hamilton Depression Rating Scale score less than 8 and a Young Mania Rating Scale score less than 6. The inclusion

criteria were being at the age of between 18-65, having a diagnosis of bipolar disorder type I, or Type II, or major depressive disorder recurrent type according to DSM-IV (APA 1994), having stable diagnosis in the last six months and stable treatment in the last two months, and demonstrating mental and cognitive ability sufficient to comply with the study protocol. The exclusion criteria were having any psychiatric diagnosis other than bipolar disorder type I or type II, or major depressive disorder recurrent type according to DSM-IV (APA 1994) including alcohol or any other substance misuse, and having any neurological or organic disease requiring chronic treatment. Control group was constituted of volunteers sufficient to conduct the statistical analyses. The inclusion criteria for the control group were being between 18-65 years, not having any psychiatric or organic diagnosis, and not being on a chronic drug treatment. The control group was included in the study not with a structured clinical interview, but with mental state examination.

The study was approved by the Ethical Committee for Clinical Researches of Celal Bayar University, School of Medicine.

Instruments

As the instruments for assessment, beside Hypomania Checklist – 32 – R, for the assessment of mood symptoms Young Mania Rating Scale (YMRS) (Karadag et al. 1996) and Hamilton Depression Rating Scale (HAM-D) (Akdemir et al. 2002) were used. Young Mania Rating Scale contains 11 items and seven of the items are 5-point Likert type, the other four of them are 9-point Likert type, and higher score indicates more severe mania. Hamilton Depression Rating Scale contains 17 items and provides 3-point or 5-point Likert type assessment, and higher score indicates more severe depression.

For cross validation, Mood Disorder Questionnaire which is validated previously into Turkish (Konuk et al. 2007) was used as the parallel scale. It is a self-rated scale with 3 items. The first item evaluates lifelong manic or hypomanic symptoms with 13 items and all items are scored in "yes" or "no" format. In the second item it is evaluated whether the items scored as "yes" in the first item are concurrent. In the third item, the impact of these items on functioning is evaluated. The scale has also the fourth (*bipolarity in the family*) and fifth (*previous diagnosis of bipolar disorder*) items which are not directly related to the positive result in the screening. The cutoff point of the Turkish version of the scale is 6/7.

Procedure

For evaluating demographic and clinical features of the subjects, a data screening form was prepared. All subjects were asked to give their consent to volunteer. Concurrently with the study scales, data screening form was applied. In the arrangement of the application of the instruments, no effort was put, and the instruments were arranged randomly.

Statistical Analyses

In the statistical analyses, in the comparison of the study groups in terms of demographic and clinical features, for categorical variables chi-square test and for continuous variables Student's T test or Analysis of Variance (ANOVA) were performed.

In the reliability analysis, Cronbach alpha coefficient for the internal consistency of both total score and score of the subscales were calculated.In addition, item-total score correlation coefficients were also obtained for the reliability analysis.

For the construct validity of the scale, exploratory factor analysis was calculated. Exploratory factor analysis was performed as principal component analysis with varimax rotation and factors with eigenvalue greater than 1 and items with factor loadings greater than 0.3 were taken into consideration. The two-domain structure of the scale obtained in the exploratory factor analysis was compared with that of the original scale. For the concurrent validity,

correlation between Hypomania Checklist – 32 – R and Mood Disorder Questionnaire was calculated. In this respect, correlation coefficients for the similar dimensions of the two scales were calculated. For the discriminative validity, analysis and curve of Receiver Operating Characteristics comparing mood disorders groups and healthy controls were obtained. Both cutoff point was calculated and sensitiviy and specificity of the scale were obtained.

RESULTS
The study was carried out with 79 patients diagnosed with bipolar disorder type 1, 26 patients diagnosed with bipolar disorder type 2 and 42 patients diagnosed with major depressive disorder attending mood disorder clinics of three university hospitals and one training hospital, and 116 healthy volunteers consisting of university students.

Demographic Fatures
Demographic and clinical features of the volunteers participating the study are demonstrated in Table 1. There was statistically significant difference between mood disorder and healthy control groups in terms of age (t=144,811, p<0,0001) and education (ki-kare=89,106, p<0,0001), and healthy controls are younger and more educated.

Reliability Analyses
In the internal consistency of Hypomania Checklist – 32 – Revised Cronbach alpha coefficient is calculated as 0,914. Item – total score correlation coefficients were between 0,235-0,743 (Table 2) and they were statistically significant (p<0,0001). Only the coefficient of item 23 (*My thoughts jump from topic to topic*) was 0,110 and it was not statistically significant. When item 23 was deleted, Cronbach alpha coefficient was obtained as 0,939.

Validity Analyses
For the structural validity of Hypomania – 32 – Revised exploratory factor analysis was performed and to test the adequacy of the sample in the Kaiser – Meier – Olkin Test, coefficient was 0,918 and in the Bartlett Test chi-square was calculated as 2,219 (p<0,0001). After demonstrating the sample adequacy, in the exploratory factor analysis a total of 6-factor solution with eigenvalue greater than 1 representing 59,7% of the total variance was found. In the scree plot, it appears that a two-factor solution was appropriate and the analysis was performed for two-factor solution. This two-factor solution represented 44,5% of the variance (Table 2). All items except item 23 (factor loading 0,081) were represented in the two-factor solution and all items in the factors had positive factor loadings. The eigenvalue of the first factor was 12,097 and it represented 36,6% of the total variance. In the first factor, 22 items such as items between 1-15, 17-20, 22, 24 and 28 were loaded. The first factor represents the domain of overactivity or elated. The eigenvalue of the second factor was obtained as 2,594 and it represented 7,8% of the total variance. There was 11 items such as items 16, 21, 25-27 and 29-32 in the second factor. The second factor identified the domain of impulsivity or risky behaviors.

In the mood disorder groups, correlation analysis between Hypomania Checklist – 32 – Revised and Mood Disorder Questionnaire of revealed a correlation coefficient of r=0,379 (p=0,003).

In order to evaluate the discrimination of patient and control groups in terms of total score of Hypomania Checklist – 32 – Revised ANOVA Test was performed. Thus, mean score (± standard deviation) of all groups with bipolar patients (18,9±8,4) was significantly higher than the mean score (15,9±9,6) of major depressive disorder and healthy control groups (t=2,297,

p=0,023). In the same analysis, it is noteworthy that the mean score of major depressive disorder group was the lowest (6,8±8,8).

In the ROC analysis of Hypomania Checklist – 32 – Revised between the bipolar disorder group and the major depressive disorder and control groups, area under the ROC curve was 0,747. Using the sensitivity and specificity values of Hypomania Checklist – 32 – Revised cutoff point was obtained on the ROC curve (Figure 1) and it was found as 14/15. For the cutoff point of 14, the sensitivity was 71,0 and the specificity was 69,8; for the cutoff point of 15 the specificity was 71,3 and the sensitivity was 68,6.

DISCUSSION
In the practice of mood disorders, it is important to discriminate between bipolar disorder and major depressive disorder in the management and treatment organization of the patient. There is no specifier in the daily routine practice in order to provide this discrimination. Clinical features, especially recognition of hypomanic symptoms are useful in this discrimination. Beside getting thorough information from significant others, self-rated scales evaluating hypomanic symptoms are the most valuable implementation in this discrimination. In this study the reliability and validity of the Turkish version of Hypomania Checklist – 32 – Revised is evaluated.

Reliability Analyses
In the reliability analysis of the scale, a very high coefficient (0,91) of Cronbach alpha was found. In the original development study of the scale, the internal consistency coefficient was obtained as 0,82 (Angst et al. 2005). In the other validation studies, it is found as 0,94 for Spanish (Vieta et al. 2007), 0,71 (Holtmann et al. 2009) and 0,76 for German (Meyer et al. 2007), 0,83 for Swedish (Meyer et al. 2007), 0,88 for Chinese (Wu et al. 2008) and 0,86 for Portuguese (Soares et al. 2010). The Turkish version of the scale shows a very good internal consistency.

In the correlation analysis of item – total score, all items except item 23 demonstrated significant correlations and there is no significant increase in the internal consistency of the scale when one item is deleted except for item 23. In the Spanish (Vieta et al. 2007) and Chinese (Wu et al. 2008) versions item – total score correlations are significant for all items. However in the German version study with outpatient adolescent group (Holtmann ve 2009), item – total score correlations of 12 items are low. In our study, item – total score correlation of item 23 (*My thoughts jump from topic to topic*) is lower than expected. Since the internal consistency is easily affected in the adolescent group when compared with the adult group and our control group is consisted of young adults, this may be related with the low internal consistency of one item. The content of this item is discriminative in the diagnosis of bipolar disorder for both adult (Piguet et al. 2010) and adolescent (Geller et al. 2002) patients. "*My thoughts jump from topic to topic*" is not represented in the integrity of the scale and this may be caused due to the young adults in the control group. In the childhood, "jumping thoughts" is a frequent pattern (Roelofs et al. 2009) and this may not be considered as specific to bipolar disorder.

Validity Analyses
In the structural validity using exploratory factor analysis a two-factor solution is preferred. These factors are composed of "overactivity or elated" and "impulsivity or risky behaviors". In the original study where the scale is developed a total of 15- and 18-factor solution were obtained in the exploratory factor analysis and two domains representing 25,7% of the total

variance are identified as "active/elated" and "risk-taking/irritable" taking the scree plot into consideration (Angst et al. 2005). In the study of the Spanish version, a two-factor solution representing 44,5% of the total variance is obtained and these are energy-activity and disinhibition (Vieta et al. 2007). In the validation study of the Brazilian version of the scale, nine factors are obtained similarly and according to the scree plot a two-factor solution representing 31,5% of the total variance was preferred (Soares et al. 2010). These factors are characterized by the domains "active/elated" and "risk-taking/irritable". In the German version of the scale 10 factors are obtained as a result of factor analysis (Meyer et al. 2007) and even though the scree plot revealed three-factor solution, taking the original study (Angst et al. 2005) into consideration, a two-factor solution is adopted indicating the same two domains. For the Swedish version, the ten-factor solution is accepted as two-factor solution representing 23,9% of the total variance (Meyer et al. 2007) and it contains the same domains with the original study. In study of the German version with adolescents, 11 factors are obtained as a result of factor analysis and a three-factor solution is adopted (Holtmann et al. 2009). Factor domains in the adolescents are active-elated, disinhibited/stimulation-seeking and irritable-erratic. In study of the Chinese version, nine factors are obtained and a two-factor solution is adopted (Wu et al. 2008). Factor domains are similar with the original study. As a result, in all studies similar findings and factor solution consistent with the structure of the original study are obtained. In our study the Turkish version represents the expected structure of the scale. However since item 23 (*My thoughts jump from topic to topic*) is not represented in the factor structure and has a low coefficient of item – total score correlation, it should be put an emphasis. Jumping thought from topic to topic is a core symptom of bipolar disorder (Goodwin ve Jamison 2007) however the presence of this symptom in depression and other psychiatric disorders (Benazzi 2005, Roelofs et al. 2009, Goldberg et al. 2009) decreases its specificity. It may be out of the factor structure due to this reason. The other reason may be that, even though there seems to be no problem in the back-translation, there may be a difficulty in the understanding of the translated item because of the cultural aspects. In the future studies, the performance of this item should be tested.

When the correlation between Hypomania Checklist – 32 – R and Mood Disorders Questionnaire is observed in criterion validity, the correlation coefficient is moderate. For the Spanish version of the scale, the correlation is good (0,84). In the study carried out by Vieta et al. (2007), subjects with bipolar disorder type II (56/118) is almost half of the bipolar sample. The disparity between HCL-32-R which has high sensitivity (Meyer et al. 2014) and MDQ which has high specificity (Zimmerman ve Galione 2011) may cause this finding. As a result, concurrent validity is demonstrated.

In order to test criterion validity ROC analysis was performed to calculate specificity and sensitivity. Area under the ROC curve (AUC) for the scale is found as 0,747. When AUC is taken into consideration, in the Brazilian study it is 0,702 and for the Chinese version it is 0,71. Regarding the AUC, the validity of the Turkish version of the scale is satisfactory. The cutoff point of the Turkish version of the scale is found to be 14/15. In the original development study, the cutoff point is also calculated as 14 but the sensitivity for this cutoff point is 80% while the specificity is 51% (Angst et al. 2005). For the Spanish version the cutoff point is obtained as 14 and the specificity and sensitivity values are 79% and 85% respectively (Vieta et al. 2007). For the Italian version the cutoff point is found as 14/15 and the specificity is 69% and the sensitivity is 73% (Carta et al. 2006). For the Chinese version the cutoff point is found as 20/21 and the specificity and sensitivity values are calculated as 67% and 70% respectively (Wu et al. 2008). In the study for the Brazilian version the cutoff point is obtained as 18 and the specificity is found as 58% and the sensitivity as 75% and

sensitivity values are (Soares et al. 2010). As seen in previous studies, cutoff points are almost the same with similar specificity and sensitivity values. It is pointed out that the Turkish version of Hypomania Checklist – 32 – R has criterion validity.

The discriminative property of Hypomania Checklist – 32 – R is demonstrated by comparing total scores between the diagnosis groups. It is found in our study that mean score of the bipolar disorder groups is significantly higher than that of major depressive disorder and healthy control groups, and it shows that it is able to discriminate between the groups. However there is no difference between bipolar disorder type I and II groups. In the original development study (Angst et al. 2005), and in the studies for the Chinese (Wu et al. 2008) and the German (Meyer et al. 2007, Holtmann et al. 2009) versions, similar results have been found. On the other hand, it is noteworthy that mean score of the control group is very close to the mean score of the bipolar disorder groups and in other previous studies, mean scores of the control group are lower.

Advantages and limitations of the Study
Some limitations should be taken into consideration while considering the results of the study. All of the healthy control group consist of young adults and no diagnostic interview is carried out. Since some psychological features in the adolescence are similar to (hypo)mania (APA 2002), it may cause a limitation for the use of the scale.

Conclusion
Bu çalışmanın sonucunda Hipomani Soru Listesi-32 -Yenilenmiş Sürümün Türkçe formunun güvenilirliği ve geçerliliği gösterilmiştir. As a conclusion of the study, it is shown the reliability and validity of the Turkish version of Hypomania Checklist – 32 – Revised. It may be used in clinical studies.

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Table 1. Demographic and clinical features of the study groups

	Mood disorder group n=147		Control group n=116	
Age[a] (mean ±S. D.)	42,6±10,8		19,4±2,3	
Gender				
Male	42	%28,6	31	%26,1
Female	105	%71,4	85	%73,9
Education[a]				
Primary school	46	%31,2	0	%0,0
High school	33	%22,5	0	%0,0
University	68	%46,3	116	%100,0
Diagnosis				
Bipolar disorder type I	79	%53,7		
Bipolar disorder type II	26	%17,7		
Major depressive disorder, recurrent	42	%28,6		

Duration of illness (years) (mean ±S. D.)	13,4±8,4
Number of episode (mean ±S. D.)	7,1±7,4
Hamilton Depression Rating Scale (mean ±S. D.)	2,0±2,2
Young Mania Rating Scale (mean ±S. D.)	0,7±1,3
Hypomania Checklist – 32 - R (mean ±S. D.)	
All groups	15,1±10,2
Bipolar disorder type I	17,8±8,8
Bipolar disorder type II	22,3±6,1
Major depressive disorder	6,8±8,8
Healthy control	13.3±6.5

[a]p<0,0001

Table 2. Factor structure and loadings, and correlation coefficients of item – total score of
Hypomania Checklist – 32 – R.

Item No	Factor 1	Factor 2	Correlation coefficient of item – total score
HCL-32-R 1	0,632		0,687
HCL-32-R 2	0,796		0,660
HCL-32-R 3	0,779		0,664
HCL-32-R 4	0,575		0,468
HCL-32-R 5	0,788		0,678
HCL-32-R 6	0,699		0,591
HCL-32-R 7	0,381		0,460
HCL-32-R 8	0,522		0,568
HCL-32-R 9	0,492		0,557
HCL-32-R 10	0,616		0,542
HCL-32-R 11	0,706		0,641
HCL-32-R 12	0,696		0,678
HCL-32-R 13	0,621		0,561
HCL-32-R 14	0,551		0,532
HCL-32-R 15	0,702		0,577
HCL-32-R 16		0,331	0,293
HCL-32-R 17	0,504		0,550
HCL-32-R 18	0,755		0,692
HCL-32-R 19	0,777		0,720
HCL-32-R 20	0,732		0,614
HCL-32-R 21		0,473	0,406
HCL-32-R 22	0,721		0,672
HCL-32-R 23	-0,026	0,081	0,110
HCL-32-R 24	0,727		0,664
HCL-32-R 25		0,649	0,415
HCL-32-R 26		0,600	0,556
HCL-32-R 27		0,671	0,462
HCL-32-R 28	0,785		0,618
HCL-32-R 29A		0,673	0,312
HCL-32-R 29B		0,554	0,303
HCL-32-R 30		0,668	0,344
HCL-32-R 31		0,398	0,323
HCL-32-R 32		0,511	0,300
Eigenvalue	12,097	2,594	
Variance (%)	36,6	7,8	

Şekil 1. Sensitivity and specificity curve of Hipomania Checklist - 32 – Revised.