Reliability and Validity Study of the Turkish Version of Bipolar Prodrome Symptom Scale

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SUMMARY

Objective: This study aimed to evaluate the reliability and validity of the Turkish version of Bipolar Prodrome Symptom Scale.

Method: Thirty subjects with bipolar disorder and 122 healthy control subjects were enrolled in this study. All participants were 1st grade students of Celal Bayar University and were part of the study on the epidemiology of bipolar disorder. The Hypomania Checklist-32-Revised was used for concurrent validity. Statistical analysis, internal consistency coefficient, item-total score correlation coefficients, exploratory factor analysis, correlation with concurrent scale and ROC curve were calculated

Results: The Bipolar Prodrome Symptom Scale was first translated into Turkish and than back-translated into English which led to the semantic harmony of the scale. Cronbach alpha coefficient was between 0.969 and 0.979, the item-total score correlations were between 0.767 and 0.929, and 0.725-0.890. The factor analysis for the severity subscale showed a one-factor solution representing 79% of the variance and the frequency subscale one-factor solution represented 72% of the solution. Correlation of Bipolar Prodrome Symptom Scale with Hypomania Checklist-32-Revised was r=0.513 and 0.530. The ROC analysis showed an area under the curve of 0.977 and 0.999. The scale discriminates well between the bipolar group and healthy control group.

Conclusion: The Turkish version of the Bipolar Prodrome Symptom Scale developed for screening hypomania is reported to be reliable and valid.

Keywords: Bipolar prodrome symptom scale, reliability, validity

INTRODUCTION

Bipolar disorder is a mental disease with recurrent episodes causing significant psychosocial and cognitive impairment events in the beginning stage of the disease (Kapczinski et al. 2009). In two thirds of the patients (Perlis et al. 2004), the onset of bipolar occurs before the age of 18, even thought the first symptoms of the disease appears at age 17. Hence, the first medical treatment is sought at the age of 24 (Berk et al. 2007). It is crucial to diagnose and treat this disorder early in order to provide a better prognosis due to the deteriorating course of the disease.Many criteria have been proposed for diagnosis in the prodromal phase (Bechdolf et al. 2014). However, looking for help is rare among these individuals and therefore screening tools will be more beneficial instead of diagnostic criteria.

Current diagnostic systems in daily practices do not have the utility to capture patients in the early phase of the disease. Therefore screening instruments for bipolar disorder is necessary. The Mood Disorder Questionnaire (MDQ) was developed by Hirschfeld and colleagues (2000) and validated into the Turkish version by Konuk and colleagues (2007). The relatively low sensitivity and specificity of the Turkish version (77% and 64% respectively) limit this questionnaire as a screening tool. In a meta-analysis study, the sensitivity was found to be 61% (Zimmerman ve Galione 2011). On the other hand, the Hypomania Checklist – 32 – Revised

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(HCL-32-R) was developed by Angst and colleagues (2005) and validated into the Turkish version by Vahip and colleagues (in press). Similar to MDQ, the sensitivity and specificity of the Turkish version of HCL-32-R was relatively low (70% and 71% respectively). In the meta-analysis study of HCL-32-R, the specificity was relatively low (65 %) (Meyer et al. 2014).

Another screening tool for capturing bipolar disorder early is the Bipolar Prodrome Symptom Scale. The Bipolar Prodrome Symptom Scale was developed by Correll and colleagues (2014) and the reliability and validity has been demonstrated. It is suggested that the scale discriminates well between bipolar disorder and other psychiatric disorders as well as healthy controls. In this aspect, it can be used as a good alternative for screening studies..

In this study, we aimed to demonstrate the reliability and validity of the Turkish version of Bipolar Prodrome Symptom Scale so we can use this scale for screening and early diagnosis of bipolar disorder.

METHOD

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

Translation Procedure

Prof Christoph of the University of Correll had granted us permission for using the Bipolar Prodrome Symptom Scale.. First, the scale was translated into Turkish by two psychiatrists, secondly, the translated Turkish scale was back-translated into English by a linguist which than was approved again by Prof. Christoph for use in this study.

Subjects

This validation study of Bipolar Prodrome Symptom Scale is a part of the study "The Prevalence and Related Risk Factors of Bipolar Disorder among Students of Celal Bayar University" which is approved by Ethical Committee for Clinical Researches of Celal Bayar University, School of Medicine [approval date: March 14th, 2013; resolution number:20478486-62 (Aydemir et al. 2016)].

In the first stage of the study, HCL-32-R was subjected to 2757 first grade students of the Celal Bayar University, selected with a simple random sampling method. One thousand six hundred eighty eight individuals had a score above the cut-off point of 14. Among those subjects, 1197 individuals provided communication details and gave informed consent. They were interviewed by SÖ and FA face-to-face or via phone with the mood disorder module of Structured Clinical Interview for DSM-IV (SCID) After the interviews, 52 individuals with a high risk of a mood disorder or diagnosed with bipolar disorder based on the mood disorder module were invited to the outpatient department of Celal Bayar University Hospital for further evaluate with a complete SCID performed by SÖ and FA . At the end of the complete SCID, 30 individuals were diagnosed for the first time with bipolar disorder (bipolar disorder type 1=16, bipolar disorder type 2=14), Individuals with an HCL-32-R score below the cut-off point 14 were considered healthy subjects. In our study 150 individuals were below the cut-off point, however only 122 individuals completed the same assessment procedure as described above.

Instruments

Bipolar Prodrome Symptom Scale – Screening. This is a scale for assessing mood symptoms in the last year in terms of severity and frequency with 14-item 6-point Likert-type rating. Because of the risk and the diagnostic predisposition, the evaluation focuses on the manic symptoms predominantly. The symptom of irritability is considered more important when compared with other scales. The items are rated between 0-5 points each and the highest score is 70. The scale provides two separate scores at the severity and frequency domains. In the original development study of the scale, the Cronbach alpha internal consistency coefficient was between 0.74 and 0.89, interclass correlation coefficients between 0.93 and 0.98. The scale also correlated well with other mood scales (Correll et al. 2014).

Hypomania Checklist – 32 – Revised aims to determine the population predisposed to developing bipolar disorder by screening all mood episodes, but more predominantly manic and hypomanic episodes. The scale consists of eight headline items. The main score of the scale is the sum up of the 32 items in the third headline item. A "yes" answer gets a score of 1 and "no" answer gets a score of 0. The cut-off point of the Turkish version of the scale is calculated as 14/15. Therefore subjects with a score above 14 are considered as the risk group predisposed to developing bipolar disorder. The original scale was developed by Angst and colleagues (2005) and was validated into Turkish by Vahip and colleagues (in press). In the reliability study of the Turkish version, Cronbach alpha coefficient was found as 0.914

Structured Clinical Interview for DSM-IV (SCID) is a guide for evaluating axis I psychiatric disorders according to DSM-IV with a structured interview. It consists of six modules and evaluates 38 axis I psychiatric disorders of DSM-IV with diagnostic criteria and 10 axis I psychiatric disorders without diagnostic criteria. Adaptation into Turkish was performed by Özkürkçügil and colleagues (1999).

Statistical Analyses

Categorical variables chi-square test, continuous variables Student's T test and Analysis of Variance (ANOVA were used

to evaluate demographic and clinical difference between the two groups

To test the psychometric properties of the scale, both of the subscales are subjected to the statistical analyses separately. In the reliability analysis, Cronbach alpha coefficient for the internal consistency and item-total score correlation coefficients were obtained. For validity analyses, exploratory factor analysis was performed and was carried out as principal component analysis with varimax rotation. Factors with eigenvalue greater than 1 and items with factor loadings greater than 0.4 were taken into consideration. For criterion validity, ROC (receiver operating characteristic) analysis was performed by calculating sensitivity and specificity of the scale comparing subjects with SCID diagnosis and without SCID diagnosis. For both subscales, ROCs were drawn and cut-off points are calculated as well as sensitivity, specificity, positive and negative predictive values were demonstrated.

RESULTS

This study consist of 30 subjects diagnosed with bipolar disorder and 122 healthy controls.

Demographic Features

Demographic and clinical features are not significant different between the bipolar and healthy control group (Table 1).

Reliability Analyses

Cronbach alpha coefficient of the severity subscale of Bipolar Prodrome Symptom Scale – Screening was 0.979. Item – total score correlation coefficients were between 0.767 and 0.929 (Table 2) and were statistically significant (p<0,0001). Cronbach alpha coefficient for the frequency subscale was 0.969. The item – total score correlation coefficients were between 0.725 and 0.890 (Table 2) and were statistically significant (p<0.0001).

Table 1. Demographic and clinical features of the study group

	Bipolar group n=30		Control group n=122	
Age (Mean ±SD)[1]	20.9±2.0		20.5±1.6	
Gender[1]				
Male	14	%46.7	51	%4.,3
Female	16	%53.3	71	%58,7
Diagnosis				
Bipolar disorder type [1]	17	%56.6		
Bipolar disorder type [2]	13	%43.4		
Hypomania Checklist-32-Revised (Mean ±SD)[2]	19.9±3.5		13.1±5.5	
Bipolar Prodrome Symptom Scale – Screening, frequency subscale (Mean ±SD)[2]	38.7±14.4		6.0±7.8	
Bipolar Prodrome Symptom Scale – Screening, severity subscale (Mean ±SD)[2]	57.8±7.4		6.5±8.6	

[1] p>0,05, [2] p<0,0001

Table 2. Factor structure and loadings, and correlation coefficients of item – total score of Bipolar Prodrome Symptom Scale – Screening, severity and frequency subscales

Item No	Factor 1		Correlation coefficient of item – total score	
	Frequency	Severity	Frequency	Severity
BPSS-1	0.836	0.919	0.809	0.904
BPSS-2	0.797	0.840	0.769	0.816
BPSS-3	0.807	0.820	0.778	0.793
BPSS-4	0.760	0.855	0.725	0.832
BPSS-5	0844	0.917	0.819	0.902
BPSS-6	0.873	0.901	0.851	0884
BPSS-7	0.778	0.848	0.743	0.824
BPSS-8	0.886	0.938	0.865	0.927
BPSS-9	0.898	0.941	0.876	0.929
BPSS-10	0.814	0.796	0.780	0.767
BPSS-11	0.859	0.910	0.833	0.893
BPSS-12	0.909	0.932	0.890	0.919
BPSS-13	0.875	0.880	0.848	0.859
BPSS-14	0.905	0.929	0.884	0.917
Eigenvalue	10.049	11.059		
Variance (%)	71,7	78,9		

BPSS: Bipolar Prodrome Symptom Scale – Screening

Validity Analyses

Exploratory factor analysis was performed for the structure validity of Bipolar Prodrome Symptom Scale – Screening. The adequacy of the sample in the Kaiser – Meier – Olkin Test, was 0.958 and the Bartlett Test chi-square were calculated as 2627.671 (p<0,0001). The exploratory factor analysis for the severity subscale showed a total of one-factor solution (Table 2) with the eigenvalue of 11.059 and representing 79% of the total variance, The factor loadings were obtained between 0.796 and 0.941. For the frequency subscale, a single factor solution with an eigenvalue of 10.046 and representing 72% of the total variance was obtained. Factor loadings of the items were between 0.760-0.909. Since single factor solution was obtained in the analysis, varimax rotation was not needed.

The correlation coefficient between Hypomania Checklist-32-Revised and the severity subscale of Bipolar Prodrome Symptom Scale – Screening was r=0.530 (p<0.0001), and the frequency subscale was r=0.513 (p<0.0001).

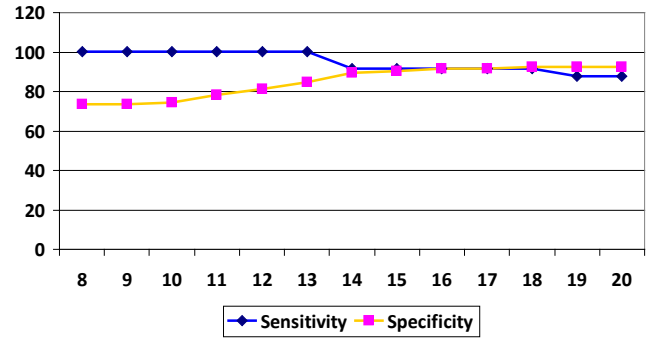

Figure 1. ROC curve of the frequency subscale of Bipolar Prodrome Symptom Scale – Screening

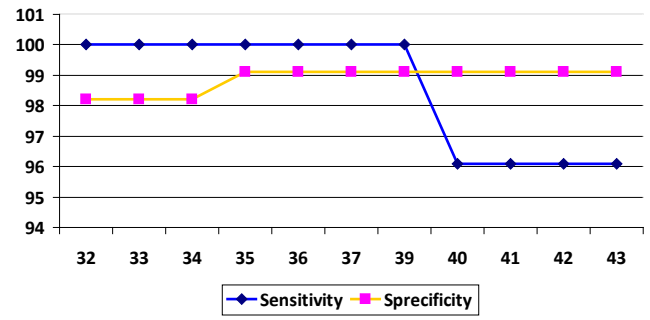

Figure 2. ROC curve of the severity subscale of Bipolar Prodrome Symptom Scale – Screening

In order to evaluate the discrimination of bipolar and healthy control groups in terms of Bipolar Prodrome Symptom Scale – Screening, ANOVA Test for the severity and frequency subscale scores were performed.

The severity subscale of the group with bipolar disorder was significantly higher than the healthy control group (mean score±SD: bipolar group, 57.8±7.4; control group 6.5±8.6; t=10.726; p<0.0001). The frequency subscale, of the bipolar group (38,7±14,4) was also significantly higher than the healthy control group (mean score±SD: bipolar group, 38.7±14.4; control group 6.0±7.8) (t=28.068, p<0.0001) (Table 1).

In the ROC analysis of Bipolar Prodrome Symptom Scale – Screening between the group with bipolar disorder and healthy control group showed an area under the ROC curve of 0.999 for the severity score and 0.977 for the frequency score.

Furthermore, cut-off points based on the ROC analysis for both of the subscale scores were calculated. The cut-off score for the frequency subscale was 17/18 (Figure 1) with sensitivity of 92%, specificity of 92%, positive predictive value of 73% and negative predictive value of 98%. The cut-off point for the severity subscale was 39/40 (Figure 2) with 96% sensitivity, 99% specificity, 96% positive predictive value and 99% negative predictive value.

DISCUSSION

It is crucial to diagnose and start treatment of bipolar disorder early in order to provide a better course and prognosis. The Mood Disorder Questionnaire (Zimmerman ve Galione 2011) and the Hypomania Checklist-32-Revised (Meyer et al. 2014, Vahip et al. in press) are unsatisfactory for an early detection of bipolar disorder. Therefore, new scales are necessary.. The validation study of the Turkish version of Bipolar Prodrome Symptom Scale – Screening developed with this aim, indicates that it is appropriate.

Reliability Analyses

In the reliability analysis of Bipolar Prodrome Symptom Scale – Screening, very high coefficients of Cronbach alpha and the item – total score correlation were found. In the original development study of the scale, high coefficients (0.74-0.89) were obtained (Correll et al. 2014). The internal consistency coefficient of Hypomania Checklist-32-Revised, was 0.914 and item-total score correlation coefficients were between 0.235 and 0.743 (Vahip et al. in press). As a result, the reliability of Bipolar Prodrome Symptom Scale – Screening is satisfactory.

Validity Analyses

In the structure validity of Bipolar Prodrome Symptom Scale – Screening, a single factor solution was obtained in the factor analysis. The scale directly focused on the diagnosis of bipolar disorder by evaluating manic/hypomanic symptoms predominantly. In other studies with Hypomania Checklist-32-Revised, a more complex factor structure is demonstrated (Vahip et al. in press, Angst et al. 2005).

For the criterion validity, the coefficients in the correlation analysis with Hypomania Checklist-32-Revised were between 0.513 and 0.530. Even though the correlation coefficients are statistically significant, they are under the expected values. A possible explanation is that Bipolar Prodrome Symptom Scale – Screening is more focused on the illness and screens symptoms directly, whereas Hypomania Checklist-32-Revised is more focused on temperament or behavior and assesses predisposition (Vahip et al. in press). In the original development study of the scale, the correlation of Young Mania Rating Scale was 0.35 (Correll et al. 2014). These results demonstrate that Bipolar Prodrome Symptom Scale – Screening meets the criterion validity.

In the discriminant analysis of the scale, ROC analysis revealed very high specificity and sensitivity. However a lower value (0.747) was obtained for the sensitivity and specificity of Hypomania Checklist-32-Revised (Vahip et al. in press). The sensitivity, specificity, positive predictive value and negative predictive value of the cut-off points of both of the subscales

are very high. Only the positive predictive value of the severity subscale was relatively low (73.%), but for the severity subscale the value was very high. Beyond, the discriminant ability of the scale between the bipolar and control groups, the mean scores were compared and showed that both of the subscales of Bipolar Prodrome Symptom Scale – Screening can discriminate between the two groups very well. In the original development study, the scale similarly discriminates between the bipolar and healthy group (Correll et al. 2014).

Advantages and Limitations of the Study

The bipolar group in this study is relatively small, but all patients were naive patients without previous diagnosis and treatment of biopolar

Conclusion

This study shows that the reliability and validity study of the Turkish version of Bipolar Prodrome Symptom Scale – Screening is suitable in daily practice and can be used in clinical studies to demonstrate the psychometric properties of the scale in clinical wards.

REFERENCES

Angst J, Adolfsson R, Benazzi F et al (2005) The HCL-32: towards a self-assessment tool for hypomanic symptoms in outpatients. J Affect Disord 88:217-33.

Aydemir Ö, Akdeniz F, Öztekin S (2016) Prevalence and risk factors of bipolar disorder in university students in Turkey. 18th ISBD International Congress, Amsterdam. Bipolar Disord 18 (Suppl S1): 91, P-070.

Bechdolf A, Ratheesh A, Cotton SM et al (2014) The predictive validity of bipolar at-risk (prodromal) criteria in help-seeking adolescents and young adults: a prospective study. Bipolar Disord 16:493-504.

Berk M, Dodd S, Callaly P et al (2007) History of illness prior to a diagnosis of bipolar disorder or schizoaffective disorder. J Affect Disord 103:181-6.

Correll CU, Olvet DM, Auther AM et al (2014) The Bipolar Prodrome Symptom Interview and Scale-Prospective (BPSS-P): description and validation in a psychiatric sample and healthy controls. Bipolar Disord 16:505-22.

Hirschfeld RM, Williams JB, Spitzer RL et al (2000) Development and validation of a screening instrument for bipolar spectrum disorder: the Mood Disorder Questionnaire. Am J Psychiatry 157: 1873-5.

Kapczinski F, Dias VV, Kauer-Sant'Anna M et al (2009) Clinical implications of a staging model for bipolar disorders. Expert Rev Neurother 9:957-66.

Konuk N, Kıran S, Tamam L et al (2007) Validation of the Turkish version of the mood disorder questionnaire for screening bipolar disorders. Turk Psikiyatri Derg 18:147-54.

Meyer TD, Schrader J, Ridley M et al (2014) The Hypomania Checklist (HCL) - systematic review of its properties to screen for bipolar disorders. Compr Psychiatry 55:1310-21.

Özkürkçügil A, Aydemir Ö, Yıldız M et al (1999) Adaptation into Turkish and reliability study of the Turkish version of the Structured Clinical Version Interview for DSM-IV Axis I Disorders. Journal of Drug and Therapeutics 12:233-6.

Perlis RH, Miyahara S, Marangell LB et al (2004) STEP-BD Investigators: long-term implications of early onset in bipolar disorder: data from the first 1000 participants in the systematic treatment enhancement program for bipolar disorder (STEP-BD). Biol Psychiatry 55:875–81.

Vahip S, Aydemir Ö, Akkaya C (in press) Reliability and Validity Study of the Turkish Version of Hypomania Checklist-32-Revised. Turk Psikiyatr Derg doi: 10.5080/u13738.

Zimmerman M, Galione JN (2011) Screening for bipolar disorder with the Mood Disorders Questionnaire: a review. Harv Rev Psychiatry 19:219-28.