

Reliability and Validity Study of The Turkish Version of Hypomania Checklist-32-Revised



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SUMMARY

Objective: In this study, we 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, the 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. Unlike the rest, the coefficient of item #23 was found as 0.110. In factor analysis, six factors were obtained; however, a two-factor solution representing 44.5% of the total variance was accepted whereas the first factor represents overactivity and being expansive, where the 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 cutoff 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, depressive and control groups.

Conclusion: Hypomania Checklist-32-Revised developed for screening hypomania is reliable and valid in Turkish after exclusion of item #23.

Keywords: Hypomania, checklist, reliability, validity

INTRODUCTION

Due to misdiagnosis, a majority of patients with bipolar disorder have a delay in receiving effective treatment (Carta and Angst 2005). One of the reasons is that the illness often starts with a depressive episode, whereas a manic episode is needed for official diagnosis (Berk et al. 2007). Another reason is that patients cannot clearly remember and inform about their past hypomanic and mild manic episodes (Angst

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 requirements are acknowledged widely (Angst et al. 2003, Akiskal and Benazzi 2005, Benazzi 2007), new classification systems such as the DSM-5 attempt to overcome these limitations. Even though these limitations are put aside, especially in the retrospective diagnosis of hypomania, the ability

Received: 07.07.2015 - Accepted: 24.11.2015

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doi: 10.5080/u13738

to overcome these difficulties contributes to timely, accurate diagnosis allowing patients to receive optimal treatment as early as possible, now considered critical. The development of mood symptom screening scales are effective for this purpose.

Mood Disorder Questionnaire, as one of the scales, was developed by Hirschfeld et al. (2000) and the Turkish translation and adaptation was validated by Konuk et al. (2007). Even though the Mood Disorder Questionnaire was 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) 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 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 translated form was controlled and accepted, we tested the comprehensibility of the by asking 10 patients to read the scale and to inform whether the statements represent their mood and if they were comprehensible. Subsequently, it was 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 clinic. 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 a 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 use disorder, and having any neurological or organic disease requiring chronic treatment. The control group 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

In addition to the Hypomania Checklist – 32 – R for the assessment of mood symptoms, the Young Mania Rating Scale (YMRS) (Karadag et al. 1996) and Hamilton Depression Rating Scale (HAM-D) (Akdemir et al. 2002) were used. The 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. The Hamilton Depression Rating Scale contains 17 items and provides a 3-point or 5-point Likert type assessment whereas a higher score indicates more severe depression.

For cross validation, Mood Disorder Questionnaire which was previously validated 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 patient functioning is evaluated. The scale has also the fourth (family history of bipolar disorder) 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

A data screening form was prepared in order to evaluate demographic and clinical features of the subjects. All subjects were asked to give their consent to volunteer. Concurrently with the study scales, a data screening form was given. The order of sections within the application and administration of the instruments was at random.

Statistical Analyses

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

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 points were calculated and sensitivity and specificity of the scales 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 Features

Demographic and clinical features of the volunteers participating the study are included in Table 1. There was a statistically significant difference between mood disorder and healthy control groups in terms of age ($t=144.811$, $p<0.0001$) and education (chi-square=89,106, $p<0.0001$), and healthy controls are younger and more educated.

Reliability Analyses

The internal consistency of Hypomania Checklist – 32 – Revised Cronbach alpha coefficient was 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 was not statistically significant. When item 23 was deleted, the Cronbach alpha coefficient was obtained as 0.939.

Table 1. Demographic and clinical features of the study groups

	Mood disorder group n=147		Control group n=116	
Age ^a (mean $\pm$ S. D.)	42,6 $\pm$ 10,8		19,4 $\pm$ 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 $\pm$ S. D.)	13,4 $\pm$ 8,4			
Number of episode (mean $\pm$ S. D.)	7,1 $\pm$ 7,4			
Hamilton Depression Rating Scale (mean $\pm$ S. D.)	2,0 $\pm$ 2,2			
Young Mania Rating Scale (mean $\pm$ S. D.)	0,7 $\pm$ 1,3			
Hypomania Checklist – 32 - R (mean $\pm$ S. D.)				
All groups	15,1 $\pm$ 10,2			
Bipolar disorder type I	17,8 $\pm$ 8,8			
Bipolar disorder type II	22,3 $\pm$ 6,1			
Major depressive disorder	6,8 $\pm$ 8,8			
Healthy control	13.3 $\pm$ 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	

Validity Analyses

To test the structural validity of Hypomania – 32 – Revised, exploratory factor analysis was performed. To test the adequacy of the sample in the Kaiser – Meier – Olkin Test, the coefficient was 0.918 and the Bartlett Test chi-square was calculated as 2.219 ($p < 0.0001$). After demonstrating the sample adequacy, a total of 6-factor solution with eigenvalue greater than 1 representing 59.7% of the total variance was found in the exploratory factor analysis. In the scree plot, it appeared

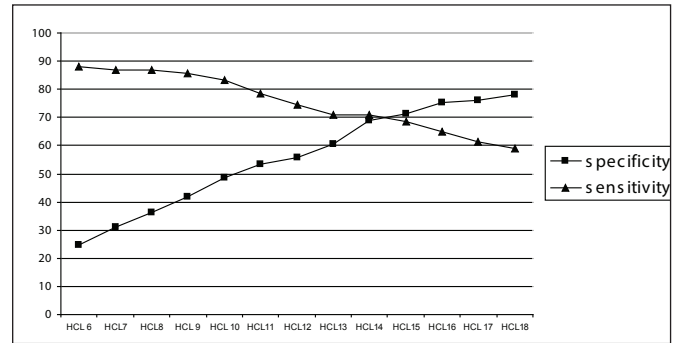


Figure 1. Sensitivity and specificity curve of Hipomania Checklist - 32 – Revised.

that a two-factor solution was appropriate and the analysis was performed for a 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, which 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, which 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 group, correlation analysis between Hypomania Checklist – 32 – Revised and Mood Disorder Questionnaire 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, the ANOVA Test was performed. Thus, mean score ($\pm$ 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 the major depressive disorder group was the lowest (6.8 ± 8.8).

In the ROC analysis comparing the bipolar disorder group, major depressive disorder and control groups of the Hypomania Checklist – 32 – Revised, the area under the ROC curve was 0.747. Using the sensitivity and specificity values of Hypomania Checklist – 32 – Revised, the 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 for the management and treatment of the patient. There is no specifier in the routine practice in order to provide this discrimination. Clinical features, especially recognition of hypomanic symptoms, are useful in this discrimination. In addition to obtaining information from significant others, self-rated scales evaluating hypomanic symptoms are the most valuable tools to discriminate between bipolar disorder and major depressive disorder. In this study, the reliability and validity of the Turkish version of Hypomania Checklist – 32 – Revised was 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 determined to be 0.82 (Angst et al. 2005). In the other validation studies, it was found to be 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. There was no significant increase in the internal consistency of the scale when one item was 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 within an outpatient adolescent group (Holtmann and 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 that our control group consisted of young adults, this may be related to 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 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, a total of 15- and 18-factor solutions were obtained in the exploratory factor analysis and two domains representing 25,7% of the total variance were 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 were 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 were characterized by the domains “active/elated” and “risk-taking/irritable”. In the German version of the scale, 10 factors were obtained as a result of factor analysis (Meyer et al. 2007). Despite the fact that the scree plot revealed a three-factor solution, taking the original study (Angst et al. 2005) into consideration, a two-factor solution was adopted indicating the same two domains. For the Swedish version, the ten-factor solution was accepted as a two-factor solution representing 23.9% of the total variance (Meyer et al. 2007) and it contains the same domains as in the original study. In study of the German version with adolescents, 11 factors were obtained as a result of factor analysis and a three-factor solution was 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 were obtained and a two-factor solution was adopted (Wu et al. 2008). Factor domains were similar with the original study. As a result in all studies, similar findings and factor solutions were obtained which are consistent with the original study. 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 emphasized. Jumping thought from topic to topic is a core symptom of bipolar disorder (Goodwin and Jamison 2007). However, the presence of this symptom in depression and other psychiatric disorders decreases its specificity (Benazzi 2005, Roelofs et al. 2009, Goldberg et al. 2009). This may be due to the factor structure. 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 and 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 was found as 0.747. When AUC is taken into consideration, it is 0.702 in the Brazilian study and is 0.71 in the Chinese study. Regarding the AUC, the validity of the Turkish version of the scale was satisfactory. The cutoff point of the Turkish version of the scale was found to be 14/15. In the original development study, the cutoff point was also calculated as 14, but the sensitivity for this cutoff point was 80% while the specificity was 51% (Angst et al. 2005). For the Spanish version, the cutoff point was obtained as 14 with the specificity and sensitivity values at 79% and 85%, respectively (Vieta et al. 2007). For the Italian version, the cutoff point was found as 14/15 with the specificity of 69% and a sensitivity of 73% (Carta et al. 2006). For the Chinese version, the cutoff point was found as 20/21 with the specificity and sensitivity calculated as 67% and 70%, respectively (Wu et al. 2008). In the study for the Brazilian version, the cutoff point was obtained as 18 with the specificity at 58% and the sensitivity at 75% (Soares et al. 2010). As seen in previous studies, cutoff points were almost the same with similar specificity and sensitivity values. It was pointed out that the Turkish version of Hypomania Checklist – 32 – R had criterion validity.

The discriminative property of Hypomania Checklist – 32 – R was demonstrated by comparing total scores between the diagnosis groups. It was found in our study that the mean score of the bipolar disorder groups was significantly higher than that of the major depressive disorder and healthy control groups, and it showed that it was able to discriminate between the groups. However, there was 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 was very close to the mean score of the bipolar disorder groups and in other previous studies, the mean scores of the control group were lower.

Advantages and limitations of the Study

Some limitations should be taken into consideration while considering the results of the study. The healthy control group consisted solely of young adults and no diagnostic interview was 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

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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