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Review article

Comparison of the screening ability between the 32-item Hypomania Checklist (HCL-32) and the Mood Disorder Questionnaire (MDQ) for bipolar disorder: A meta-analysis and systematic review

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ABSTRACT

The frequent misdiagnosis of bipolar disorder (BD) is associated with detrimental consequences and inappropriate treatments. The 32-item Hypomania Checklist (HCL-32) and the Mood Disorder Questionnaire (MDQ) are widely used self-report screening instruments for BD. This is a systematic review and meta-analysis to compare the psychometric properties of the HCL-32 and the MDQ based on the same patient samples. Two reviewers systematically and independently searched PubMed, PsycINFO, EMBASE, Web of Science, and Cochrane Library databases. Studies using the HCL-32 and MDQ concurrently and reporting their psychometric properties were included. Eleven studies that met the entry criteria were included in the systematic review, and 9 studies with relevant data were included in the meta-analysis. Using study-defined cutoffs, summary sensitivities were 82% (95% CI: 72%-89%) and 80% (95% CI: 71%-86%), while specificities were 57% (95% CI: 48%-66%) and 70% (95% CI: 59%-71%) for the HCL-32 and the MDQ respectively. Both the HCL-32 and the MDQ have acceptable psychometric properties to identify BD and appear to be useful screening tools for BD.

1. Introduction

Bipolar disorder (BD) is a chronic psychiatric illness frequently misdiagnosed in clinical practice (Carvalho et al., 2015). BD is often misdiagnosed as major depressive disorder (MDD) (Phillips and Kupfer, 2013; Culpepper, 2014), which could lead to inappropriate treatment (Calabrese et al., 2003) resulting in adverse consequences, such as increased suicide risk (McCombs et al., 2007), poorer response to antidepressants and antidepressant-induced switch to mania (Smith et al., 2008). On average it takes around 10 years to correctly establish the diagnosis of BD, and around one-third of patients with BD are misdiagnosed at least once (Lish et al., 1994; Drancourt et al., 2013). Therefore, early identification of BD is essential for appropriate treatment (Angst et al., 2005).

Standardized diagnostic instruments, such as the Structured Clinical Interview for DSM (SCID), have been developed to accurately establish psychiatric diagnoses, but they are time-consuming and require trained interviewers (Zimmerman et al., 2004). In contrast, self-report screening instruments are brief and cost-effective. Instruments, such as the 32-item Hypomania Checklist (HCL-32) (Angst et al., 2005), the Bipolar Spectrum Diagnostic Scale (BSDS) (Ghaemi et al., 2005) and the Mood Disorder Questionnaire (MDQ) (Hirschfeld et al., 2000), have

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been developed to ascertain BD, particularly to differentiate it from MDD in research and clinical practice. The HCL-32 and the MDQ are two of the most widely used screening tools for BD (Carvalho et al., 2015) that have been validated in many countries (Angst et al., 2005; Meyer et al., 2007; Twiss et al., 2008; Wang et al., 2009; Soares et al., 2010; Bech et al., 2011; Yang et al., 2011; Chou et al., 2012; Yang et al., 2012; Gamma et al., 2013; Mosolov et al., 2014).

Several studies have compared the sensitivity and specificity of the HCL-32 and the MDQ to detect BD (Carta et al., 2006; Soares et al., 2010; Bech et al., 2011; Rybakowski et al., 2012; Nallet et al., 2013; Feng et al., 2017), but the results were inconsistent. A systematic review examined the comparative validity of the HCL-32 and the MDQ in identifying depressed patients with BD, but the psychometric properties of the scales were not meta-analyzed (Bech et al., 2013). A meta-analysis explored the ability of BD screening tools, but the psychometric properties of the HCL-32 and the MDQ were not tested in the same patient samples in some of the included studies (Carvalho et al., 2015). It is important to compare the screening ability of the HCL-32 and the MDQ to identify the better tool that has higher specificity and/or sentivitity in clinical practice and research.

This study is a systematic review and meta-analysis of the studies which directly compared the psychometric properties of the HCL-32 and the MDQ in identifying BD based on the same patient samples.

2. Methods

2.1. Selection criteria

Original studies published in English language that made head-to-head comparisons between the HCL-32 and the MDQ in the same participant sample and reported data of psychometric properties were included in the meta-analysis. Diagnosis of BD had to be established according to any standard international diagnostic criteria, such as the Diagnostic Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association, 1994), DSM-IV-TR (American Psychiatric Association, 2000), and the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) (World Health Organization, 1992). No restrictions were made in terms of study settings and samples. Studies that used modified versions of the HCL-32 or the MDQ, or were conducted in special populations, such as children and adolescents, were excluded.

2.2. Search methods

The PubMed, PsycINFO, EMBASE, Web of Science and Cochrane Library databases were systematically and independently searched from their inception until June 7, 2018 by two reviewers (YYW and DDX). The following search terms were used: (“Hypomania Checklist” OR “HCL” OR “Hypomania/Mania Symptoms Checklist” OR “Hypomania Symptoms Checklist”). Reference lists of reviews and articles were also hand-searched for additional studies.

2.3. Data extraction

Two reviewers (YY and RL) systematically and independently screened the titles and abstracts, read full text of potentially eligible articles and extracted data. Any inconsistencies in the above procedures were resolved by a discussion with a senior reviewer (YTX). The following information was extracted and tabulated: first author, publication year, total number of participants included in the comparative analysis, study setting, participants’ demographic and clinical characteristics and psychometric information of the scales including cut-off score, sensitivity, specificity, and reliability.

2.4. Quality assessment

Study quality was independently assessed by two reviewers (YY and RL) using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) tool (Whiting et al., 2011) that has been used in other studies (Carvalho et al., 2015). The QUADAS-2 assesses risk of bias in four domains including patient selection, index text, reference standard, and flow and timing. The first three domains also assess applicability concerns.

2.5. Data synthesis and statistical analyses

The Open Meta-Analyst program (http://www.brown.edu) was applied to synthesize data and conduct additional analyses. To explore variation in diagnostic properties across studies, the estimate of the observed sensitivities and specificities for both scales in forest plots were plotted and the extracted data were examined in receiver-operating characteristic (ROC) space. The summary ROC (SROC) curve showed the expected trade-off between sensitivity and specificity across studies. For studies that reported sensitivities and specificities using multiple cut-offs, e.g., using the cut-offs suggested by respective validation studies (Feng et al., 2017) or those based on the maximum of the sum of the sensitivity and specificity (Chou et al., 2012), the optimal study-defined cut-off was selected; only the sensitivity and specificity reported in the same study were extracted for meta-analysis.

3. Results

3.1. Literature search and study characteristics

A total of 647 relevant articles were initially identified, of which 11 studies covering 2,902 participants were included in the systematic review, and 9 studies covering 1,615 participants were included in the meta-analysis (Fig. 1). Two of the 11 studies did not provide sufficient meta-analyzable data to compare the HCL-32 and the MDQ (Vieta et al., 2007; Rybakowski et al., 2012) (Table 1). The 11 studies were conducted in the following countries: China (3 studies, n = 714), Italy (2 studies, n = 216), Switzerland (1 study, n = 152), Brazil (1 study, n = 123), Denmark (1 study, n = 122), Germany (1 study, n = 288), Spain (1 study, n = 236), and Poland (1 study, n = 1051). Seven studies used the DSM-IV (American Psychiatric Association, 1994), one study used the DSM-IV-TR (American Psychiatric Association, 2000), two studies used the ICD-10 (World Health Organization, 1992), and one study used both the DSM-IV and the ICD-10 as the diagnostic criteria for BD (Table 1). The language and validation data of the HCL-32 and the MDQ of the included studies are listed in Supplementray Table 1.

3.2. Quality assessment

The quality of included studies in terms of the overall risk of bias and applicability concerns was assessed with the QUADAS-2, (Supplementary Table 1). Most studies had a low risk of bias and low risk in applicability concerns. Six studies (54.5%) showed high risk in the index test domain, and 5 studies (45.4%) had unclear risk in patient selection domain.

3.3. Reliability

Five studies reported Cronbach's alpha of the HCL-32 that ranged from 0.86 to 0.94, while 4 studies reported that of the MDQ that ranged from 0.75 to 0.90 (Table 1). None of the studies reported test-retest reliability of the HCL-32 or the MDQ.

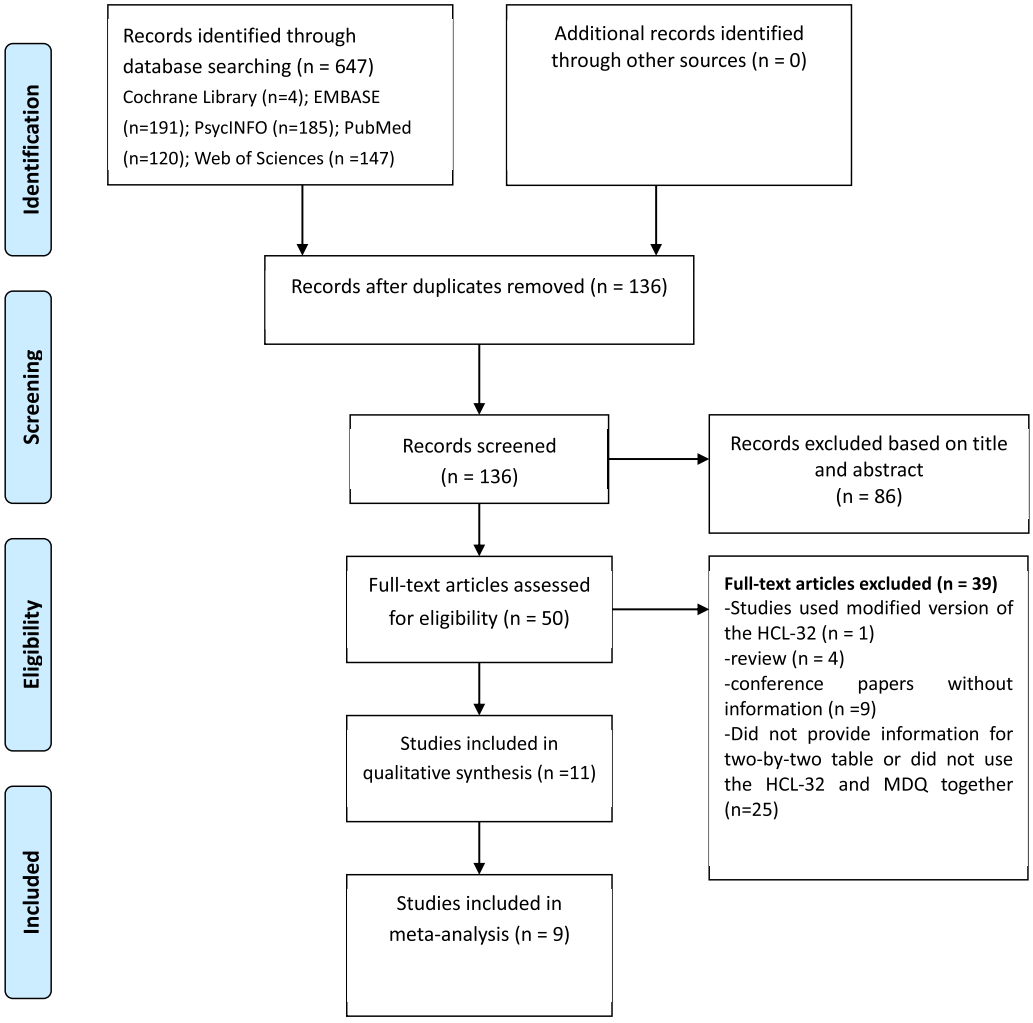

Fig. 1. PRISMA flow diagram.

3.4. Correlations between the HCL-32 and the MDQ

Three studies reported the association between the mean scores of the HCL-32 and the MDQ; the correlation coefficients ranged from 0.66 to 0.84 (Table 1).

3.5. The ability of detecting BD

Nine studies reported the diagnostic accuracy of the HCL-32 and the MDQ for BD in terms of sensitivity and specificity. Cut-offs of the HCL-32 ranged from 7 to 18 and around half of the studies (45%) chose the cutoff of 14 as optimal. Cut-offs for the MDQ ranged from 3 to 7 and nearly half of the studies (45%) found the cutoff of 7 as optimal. Details of the optimal cut-offs are listed in Table 1.

The pooled sensitivity of the HCL-32 was 82% (95% CI: 72%−89%), and that of the MDQ was 80% (95%CI: 71%−86%; Fig. 2). The pooled specificity of the HCL-32 was 57% (95%CI: 48%−66%), and that of the MDQ was 70% (95%CI: 59%−71%, Fig. 3). The summary ROC plots of the HCL-32 and the MDQ are presented in Fig. 4.

4. Discussion

This systematic review and meta-analysis compared the psychometric properties of the HCL-32 and the MDQ in identifying BD. The comparative accuracy of the two scales found in the included studies was based on head-to-head comparisons, which minimizes the confounding effects caused by different population characteristics (Takwoingi et al., 2013).

A previous review did not find differences between the HCL-32 and the MDQ in ascertaining of BD in clinical settings testing a sample of depressed patients (Bech et al., 2013). In this study, the HCL-32 and the MDQ had similar sensitivity and specificity in detecting BD. Considering the length of the questionnaires, the MDQ may be preferred in clinical settings. The cut-off scores were different across studies. The validated cut-off should be chosen with respect to the local socio-cultural background. It should be noted that included studies were conducted in countries with vastly different socio-cultural background. Due to the potentially confounding effects caused by cross-cultural factors, direct comparisons between the two scales should be made with caution. Furthermore, a number of studies did not only include both MDD and BD samples (Carta et al., 2006; Nallet et al., 2013; Sasdelli et al., 2013). More studies directly comparing MDD and BD are needed.

There are several limitations to this meta-analysis and systematic review. First, the diagnostic properties of both scales vary with different cut-offs. Studies used different optimal cut-offs, thus data was analyzed with the study-defined optimal cut-offs. Second, only English-language databases were searched. Third, only 9 studies were included in the meta-analysis, therefore publication bias could not be examined. Fourth, due to the insufficiently detailed datasets, more complicated analyses could not be performed. For example, the propotions of BD-I, BD-II and BD NOS could affect sensitivity and specifivity. However,

Table 1
Study characteristics and main findings.

	Author (year)	Country	Setting	Participants N [a]	Age Mean (SD)	Male N(%)	BD Diagnostic Criteria	BD Types (I/II/NOS)	HCL-32 reliability	MDQ reliability	HCL-32 cutoffs	MDQ cutoffs	Optimal cut-off defined criterion	Correlation between HCL-32 & MDQ
1	Feng, Y (2017)	China	Inpatients	350	37.7 (13.0)	109 (31.1)	ICD-10, MINI 5.0	90 (BD-I)/ 99 (BD-II)	NA	NA	14	3	(1)	NA
2	Sasdelli, A (A. 2013)	Italy	Outpatients	93	49.1 (15.1)	26 (27.7)	DSM-IV	11 (BD-II)	NA	NA	15	5	(2)	NA
3	Nallet, A (A. 2013)	Switzerland	Outpatients	152	NA	93 (61.2)	Structured Clinical Interview for DSM-IV (SCID)	2 (BD-I)/21 (BD-II)/10 (NOS)	NA	NA	14	7	(2)	NA
4	Rybakowski, JK (J.K. 2012)	Poland	Outpatients	1051	46 (11)	298 (28.4)	ICD-10	NA	NA	NA	14	7	(1)	0.77***
5	Poon, Y (Y. 2012) [b]	China	Outpatients	305	48.9 (9.6)	101 (33.1)	Tel-based Structured Clinical Interview for DSM-IV (SCID)	14 (BD-II)/ 17 (NOS)	0.89	0.75	11	4	(2)	NA
6	Chou, CC (C.C. 2012)	China	Outpatients	59	40.81 (11.17)	20 (33.9)	Structured Clinical Interview for DSM-IV (SCID)	2 (BD-I)/ 5(BD-II)	0.91	0.76	7	6	(2)	NA
7	Meyer, DT (T.D. 2011) [c]	Germany	Outpatients	288	42.9 (13.1)	122 (37.3)	Structured Clinical Interview for DSM-IV (SCID)	99 (BD-I)/ 33 (BD-II)	0.88	0.88	14	7	(1)	0.66**
8	Bech, P (P. 2011)	Denmark	Outpatients (recently discharged)	122	41.5 (13.3)	47 (38.5)	ICD-10, Structured Clinical Interview for DSM-IV (SCID-II)	59 (BD-1)	NA	NA	18	7	(2)	NA
9	Soares, TO (2010)	Brazil	Outpatients	123	42 (11.1)	26 (21.1)	Structured Clinical Interview for DSM-IV-TR (SCID-I/P-DSM-IV)	37 (BD-I)/ 44 (BD-II)	0.86	NA	18	7	(2)	NA
10	Vieta, E (2007)	Spain	Outpatients	236	43.5 (11.9)	80 (33.9)	DSM-IV-TR	62 (BD-I)/ 56 (BD-II)	0.94	0.90	14	NA	(2)	0.84**
11	Carta, GM (2006)	Italy	NA	123	37.5 (11.9)	41 (33.3)	Structured Clinical Interview for DSM-IV (SCID)	14 (BD-I)/ 10 (BD-II	NA	NA	12	5	(2)	NA

Abbreviations: BD = Bipolar Disorders; BD-I = Bipolar I Disorder; BD-II = Bipolar II Disorder; DSM-IV= Diagnostic Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV); ICDD-10 = International Statistical Classification of Diseases and Related Health Problems 10th Revision; MD = Major Depression; MDDR= Recurrent Major Depressive Disorder; PCA= Principal Component Analysis; RDD= Recurrent Depressive Disorder; ROC = Receiver Operated Characteristic; TRD= Treatment Resistant Depression; MINI= Mini International Neuropsychiatric Interview; N= Number; NA = Not Available. (1) represents suggested by previous validation studies, (2) represents calculated using the best combination of sensitivity and specificity, and ROC analysis.

[a] The total number was calculated by the number of participants entered into the comparison analysis.

[b] The screening comparisons were conducted in patients with MDD, Generalized Anxiety Disorder, Panic Disorder etc. The data for the discriminate ability between BD and MDD were extracted.

[c] The screening comparisons were conducted in patients with unipolar depression, Generalized Anxiety Disorder, eating/substance disorder etc. The data for the discriminate ability between BD and unipolar depression were extracted.

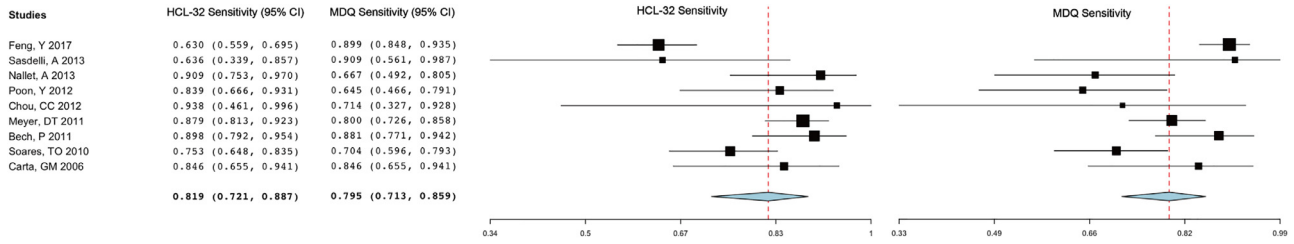

Fig. 2. Forest plot of pooled sensitivities of the HCL-32 and MDQ in detecting bipolar disorder.

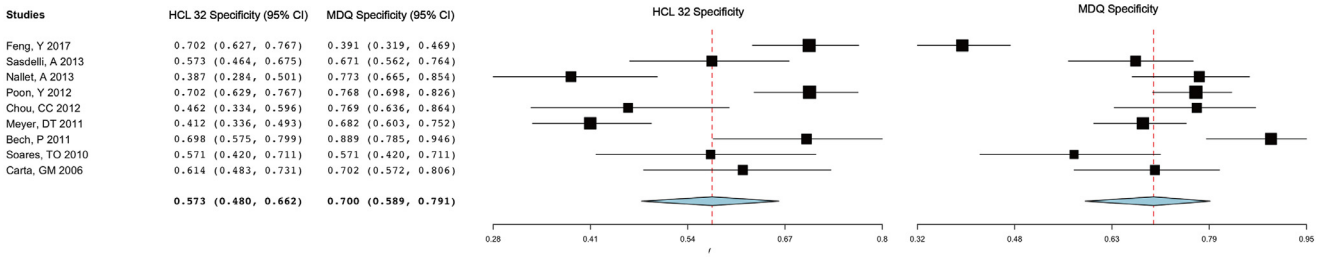

Fig. 3. Forest plot of pooled specificities of the HCL-32 and MDQ in detecting bipolar disorder.

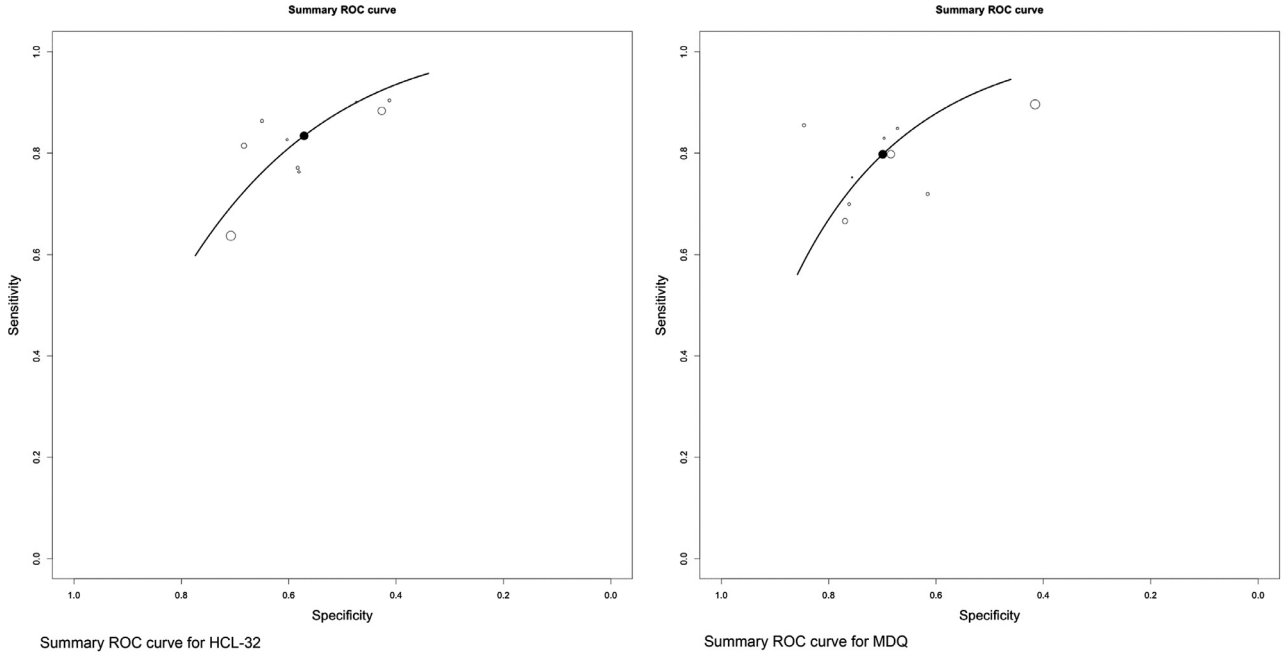

Fig. 4. Summary ROC plots of the HCL-32 and MDQ in detecting bipolar disorder.

most studies did not report the discrimination ability of the questionnaires between different types of BD and MDD. Finally, the samples were heterogeneous, e.g., some studies included patients with substance use disorders, other psychiatric disorders, or just depressive symptoms (Carta et al., 2006; Nallet et al., 2013; Sasdelli et al., 2013).

In conclusion, both the HCL-32 and the MDQ appear to be useful screening tools with acceptable psychometric properties for BD. It should be noted that applying screening instruments for BD could lead to high false positive cases (Cerimele et al., 2014). Therefore, patients identified by the HCL-32 and the MDQ should receive a confirmatory diagnostic interview (Carvalho et al., 2015).

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2019.01.061.

References

American Psychiatric Association, 1994. Diagnostic and Statistical Manual of Mental Disorders, 4th edition. American Psychiatric Association, Washington.

American Psychiatric Association, 2000. Diagnostic and Statistical Manual of Mental disorders, Text Revision (DSM-IV-TR). American Psychiatric Association, Washington.

Angst, J., Adolfsson, R., Benazzi, F., Gamma, A., Hantouche, E., Meyer, T.D., et al., 2005. The HCL-32: towards a self-assessment tool for hypomanic symptoms in outpatients. J. Affect. Disord. 88, 217–233.

Bech, P., Christensen, E.M., Vinberg, M., Bech-Andersen, G., Kessing, L.V., 2011. From items to syndromes in the Hypomania Checklist (HCL-32): psychometric validation and clinical validity analysis. J. Affect. Disord. 132, 48–54.

Bech, P., Engell, R., Moller, S.B., 2013. Comparative validity of inventories and checklists for identifying depressed patients with hidden bipolarity. Neuropsychiatry-Lond. 3, 331–343.

Calabrese, J.R., Hirschfeld, R.M.A., Reed, M., Davies, M.A., Frye, M.A., Keck, P.E., et al., 2003. Impact of bipolar disorder on a US community sample. J. Clin. Psychiat. 64, 425–432.

Carta, M.G., Hardoy, M.C., Cadeddu, M., Murru, A., Campus, A., Morosini, P.L., et al., 2006. The accuracy of the Italian version of the Hypomania Checklist (HCL-32) for the screening of bipolar disorders and comparison with the Mood Disorder Questionnaire (MDQ) in a clinical sample. Clin. Pract. Epidemiol. Mental Health: CP EMH 2, 2.

Carvalho, A.F., Takwoingi, Y., Sales, P.M.G., Soczynska, J.K., Kohler, C.A., Freitas, T.H., et al., 2015. Screening for bipolar spectrum disorders: A comprehensive meta-analysis of accuracy studies. J. Affect. Disord. 172, 337–346.

Cerimele, J.M., Chwastiak, L.A., Dodson, S., Katon, W.J., 2014. The prevalence of bipolar disorder in general primary care samples: a systematic review. Gen. Hosp. Psychiat. 36, 19–25.

Chou, C.C., Lee, I.H., Yeh, T.L., Chen, K.C., Chen, P.S., Chen, W.T., et al., 2012. Comparison of the validity of the Chinese versions of the Hypomania Symptom Checklist-32 (HCL-32) and Mood Disorder Questionnaire (MDQ) for the detection of bipolar disorder in medicated patients with major depressive disorder. Int. J. Psychiatry Clin. Pract. 16, 132–137.

Culpepper, L., 2014. Misdiagnosis of bipolar depression in primary care practices. J. Clin. Psychiatry 75 (1), 478 -475.

Drancourt, N., Etain, B., Lajnef, M., Henry, C., Raust, A., Cochet, B., et al., 2013. Duration of untreated bipolar disorder: missed opportunities on the long road to optimal treatment. Acta Psychiatr. Scand. 127, 136–144.

Feng, Y., Wang, Y.Y., Huang, W., Ungvari, G.S., Ng, C.H., Wang, G., et al., 2017. Comparison of the 32-item Hypomania Checklist, the 33-item Hypomania Checklist, and the mood disorders questionnaire for bipolar disorder. Psychiatry Clin. Neurosci. 71, 403–408.

Gamma, A., Angst, J., Azorin, J.M., Bowden, C.L., Perugi, G., Vieta, E., et al., 2013. Transcultural validity of the Hypomania Checklist-32 (HCL-32) in patients with major depressive episodes. Bipolar Disord. 15, 701–712.

Ghaemi, S.N., Miller, C.J., Berv, D.A., Klugman, J., Rosenquist, K.J., Pies, R.W., 2005. Sensitivity and specificity of a new bipolar spectrum diagnostic scale. J. Affect. Disord. 84, 273–277.

Hirschfeld, R.M., Williams, J.B., Spitzer, R.L., Calabrese, J.R., Flynn, L., Keck Jr., P.E., et al., 2000. Development and validation of a screening instrument for bipolar spectrum disorder: the mood disorder questionnaire. A. J. Psychiatry 157, 1873–1875.

Lish, J.D., Dimemeenan, S., Whybrow, P.C., Price, R.A., Hirschfeld, R.M.A., 1994. The national Depressive and Manic-Depressive Association (Dmda) survey of bipolar members. J. Affect. Disord. 31, 281–294.

McCombs, J.S., Ahn, J., Tencer, T., Shi, L., 2007. The impact of unrecognized bipolar disorders among patients treated for depression with antidepressants in the fee-for-services California Medicaid (Medi-Cal) program: a 6-year retrospective analysis. J. Affect. Disord. 97, 171–179.

Meyer, T.D., Bernhard, B., Born, C., Fuhr, K., Gerber, S., Schaerer, L., et al., 2011. The Hypomania Checklist-32 and the Mood Disorder Questionnaire as screening tools - going beyond samples of purely mood-disordered patients. J. Affect. Disord. 128, 291–298.

Meyer, T.D., Hammelstein, P., Nilsson, L.G., Skeppar, P., Adolfsson, R., Angst, J., 2007. The Hypomania Checklist (HCL-32): its factorial structure and association to indices of impairment in German and Swedish nonclinical samples. Compr. Psychiatry 48, 79–87.

Mosolov, S.N., Ushkalova, A.V., Kostukova, E.G., Shafarenko, A.A., Alfimov, P.V., Kostyukova, A.B., et al., 2014. Validation of the Russian version of the Hypomania Checklist (HCL-32) for the detection of Bipolar II disorder in patients with a current diagnosis of recurrent depression. J. Affect. Disord. 155, 90–95.

Nallet, A., Weber, B., Favre, S., Gex-Fabry, M., Voide, R., Ferrero, F., et al., 2013. Screening for bipolar disorder among outpatients with substance use disorders. Eur. Psychiat. 28, 147–160.

Phillips, M.L., Kupfer, D.J., 2013. Bipolar disorder diagnosis: challenges and future directions. The Lancet 381, 1663–1671.

Poon, Y., Chung, K.F., Tso, K.C., Chang, C.L., Tang, D., 2012. The use of mood disorder questionnaire, Hypomania Checklist-32 and clinical predictors for screening previously unrecognised bipolar disorder in a general psychiatric setting. Psychiatry Res. 195, 111–117.

Rybakowski, J.K., Dudek, D., Pawlowski, T., Lojko, D., Siwek, M., Kiejna, A., 2012. Use of the Hypomania Checklist-32 and the Mood Disorder Questionnaire for detecting bipolarity in 1051 patients with major depressive disorder. Eur. Psychiatry J. Assoc. Eur. Psychiatr. 27, 577–581.

Sasdelli, A., Lia, L., Luciano, C.C., Nespeca, C., Berardi, D., Menchetti, M., 2013. Screening for bipolar disorder symptoms in depressed primary care attenders: comparison between Mood Disorder Questionnaire and Hypomania Checklist (HCL-32). Psychiatry J. 2013, 548349.

Smith, D., Ghaemi, S., Craddock, N., 2008. The broad clinical spectrum of bipolar disorder: implications for research and practice. J. Psychopharm. 22, 397–400.

Soares, O.T., Moreno, D.H., de Moura, E.C., Angst, J., Moreno, R.A., 2010. Reliability and validity of a Brazilian version of the Hypomania Checklist (HCL-32) compared to the Mood Disorder Questionnaire (MDQ). Revista Brasileira De Psiquiatria 32, 416–423.

Takwoingi, Y., Leeflang, M.M.G., Deeks, J.J., 2013. Empirical evidence of the importance of comparative studies of diagnostic test accuracy. Ann. Intern. Med. 158 544–+.

Twiss, J., Jones, S., Anderson, I., 2008. Validation of the Mood Disorder Questionnaire for screening for bipolar disorder in a UK sample. J. Affect. Disord. 110, 180–184.

Vieta, E., Sanchez-Moreno, J., Bulbena, A., Chamorro, L., Ramos, J.L., Artal, J., et al., 2007. Cross validation with the mood disorder questionnaire (MDQ) of an instrument for the detection of hypomania in Spanish: the 32 item hypomania symptom check list (HCL-32). J. Affect. Disord. 101, 43–55.

Wang, Y.T., Yeh, T.L., Lee, I.H., Chen, K.C., Chen, P.S., Yang, Y.K., et al., 2009. Screening for bipolar disorder in medicated patients treated for unipolar depression in a psychiatric outpatient clinic using the Mood Disorder Questionnaire. Int. J. Psychiatry Clin. Pract. 13, 117–121.

Whiting, P.F., Rutjes, A.W.S., Westwood, M.E., Mallett, S., Deeks, J.J., Reitsma, J.B., et al., 2011. QUADAS-2: A revised tool for the quality assessment of diagnostic accuracy studies. Ann. Intern. Med. 155, 529–U104.

World Health Organization, 1992. The ICD-10 Classification of Mental and Behavioural disorders: Clinical Descriptions and Diagnostic Guidelines. World Health Organization, Geneva.

Yang, H.C., Xiang, Y.T., Liu, T.B., Han, R., Wang, G., Hu, C., et al., 2012. Hypomanic symptoms assessed by the HCL-32 in patients with major depressive disorder: a multicenter trial across China. J. Affect. Disord. 143, 203–207.

Yang, H.C., Yuan, C.M., Liu, T.B., Li, L.J., Peng, H.J., Liao, C.P., et al., 2011. Validity of the 32-item Hypomania Checklist (HCL-32) in a clinical sample with mood disorders in China. BMC psychiatry 11, 84.

Zimmerman, M., Posternak, M.A., Chelminski, I., Solomon, D.A., 2004. Using questionnaires to screen for psychiatric disorders: a comment on a study of screening for bipolar disorder in the community. J. Clin. Psychiatry 65, 605–610 discussion 721.