

Convergence of children's depression rating scale-revised scores and clinical diagnosis in rating adolescent depressive symptomatology

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Abstract

The Children's Depression Rating Scale-Revised (CDRS-R) is a widely used instrument for research on depression in minors. A raw score of ≥ 40 has often been used as indicator of depressive symptomatology. As a validated German version of the CDRS-R has recently become available, we assessed CDRS-R raw summary scores of a video taped interview session in two different rater groups and compared them with clinical ratings of International Classification of Diseases (ICD-10) depression diagnosis as observed by a third independent group. We found that for the German version a raw score between 35 and 40 is indicative for mild depressive symptomatology as described by the ICD-10. CDRS-R scores show potential clinical applicability to deduct levels of depression.

Introduction

The Children's Depression Rating Scale-Revised (CDRS-R)¹ is nowadays one of the most frequently used instruments for the assessment of depressive symptomatology in minors in the context of clinical trials. It was originally intended as rating scale for the age group from 6 to 12 years, but is also widely used in adolescents.² The CDRS-R is a clinician administered 17-item interview, with item ratings between 1 (=no difficulties) and 5 or 1 and 7 (=clinically significant difficulties) (adding up to a total score between 17 to 113). It has been proposed, that a score of ≥ 40 indicates depressive symptomatology, whereas a score ≤ 28 was often used as indicative of remission within trials.² Good psychometric properties have been reported from the age group between 6 and 12 years (with an internal consistency of Cronbach's $\alpha=0.85$) as well as convergent validity with global depression rating ($r=0.92$).¹ In a placebo controlled treat-

ment study of 96 children (8-11 years) with fluoxetine, a Cronbach's α of 0.86 was reported for the CDRS, as well as a correlation with the Montgomery-Asberg Depression Scale (MADRS)³ at baseline ($r=0.51$) and after the 9 weeks of the trial ($r=0.85$).⁴ Only recently, psychometric properties have been established in a sample of 145 adolescents with an age range between 12 and 18 years.² The authors reported an excellent internal consistency of Cronbach's α ranging between 0.79 and 0.92 for their three assessment waves (screening, baseline and exit). At the screening visit, the CDRS-R total score was significantly correlated with a major depressive disorder (MDD) diagnosis obtained from the Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS)⁵ ($r=0.64$; $P<0.01$). CDRS-R total scores were highly correlated with the Clinical Global Impression-Severity (CGI-S) at each of the three waves of the study ($r=0.87$, 0.80 and 0.93; $P<0.01$). Recently a German version of the CDRS-R was applied in 60 child and adolescent psychiatric inpatients (age range: 7.5-17.9 years),⁶ demonstrating good psychometric properties (internal consistency: Cronbach's $\alpha=0.90$) with high correlation with the Beck's Depression Inventory II (German version by Hautzinger *et al.*, 2006)⁷ in a subsample of 35 adolescents ($r=0.79$, $P<0.001$). In addition, the German version of the CDRS-R was also validated in a German child and adolescent (6.6 to 17.9 years) school population ($n=275$), showing good internal consistency (Cronbach's $\alpha=0.86$) as well, with a mean CDRS-R raw score of 25.18 (SD=7.96, range: 17-60).⁸

As up to now most of the literature available on the CDRS-R refers to US samples, thus comparing raw scores with *Diagnostic and statistical manual of mental disorders, 4th ed.* (DSM-IV) criteria for MDD, so far to our knowledge no study is available that compared CDRS-R scores with the clinical impression leading to International Classification of Diseases-10 diagnosis. As DSM-IV and International Classification of Diseases-10 (ICD-10) diagnostic criteria differ slightly, no information is available on how far CDRS-R scores offer information about the level of depressive symptomatology (mild, moderate or severe) of depressive episodes as defined by the ICD-10 (diagnosis of F32.0, F32.1 and F32.2 respectively). This is of relevance for establishing cut-off scores for future studies aiming to address mild to moderate forms of depressive symptomatology as defined in the ICD-10 and as treatment recommendations refer to the severity of depression, which is hardly assessed by assessment tools in clinical routine care.⁹

The aim of this study was to explore the convergence between raw scores of the CDRS-R and clinical diagnosis according to ICD-10.

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Materials and Methods

The study consisted of two phases: in the first phase, we established a standardization for a video sample of an CDRS-R interview, conducted by a child and adolescent psychotherapist and clinical psychologist at PhD level with an adolescent female inpatient, 15 years of age. The patient gave informed assent to use the video sample for research purpose to be played to a clinical audience, written informed consent was obtained from the caregivers. The video was played to 22 mental health professionals (psychologists and child and adolescent psychiatrists) to establish a standardized raw score. Ratings ranged between 29 and 58, with a mean raw score of 39.05 (SD=7.30) and a median of 37. The internal consistency was good (Cronbach's $\alpha=0.82$). In a second phase, the same video sample was played to an audience ($n=32$) with mixed clinical experience background (see Table 1 for details). The audience was randomized in two groups before the video sample was played with one group performing a CDRS-R rating and one group coming up with a clinical diagnosis according to ICD-10. CDRS-R and ICD-10 criteria were handed out to the mem-

Table 1. Professions and years of experience of the participants in the rating experiment.

Profession	n	Years of experience	Rating CDRS-R	Rating ICD-10
Medical student (8-11th term)	10	0	4	6
Psychologist	2	0-10	1	1
Child and Adolescent psychiatry resident	3	0-2	2	1
Pedagogues	2	1-4	1	1
Psychotherapists in training	9	0-10	6	3
Licensed psychotherapist	2	6	1	1
Music therapist	2	5-9	2	0
Child and Adolescent Psychiatry Consultant	2	5-12	1	1

CDRS-R, Children's Depression Rating Scale-Revised; ICD-10, International Classification of Diseases -10.

bers of the group accordingly. Furthermore all participants were asked to rate on the Clinical Global Impression-Severity scale (CGI-S) between 1 (not at all ill) and 7 (extremely ill).

Results

All participants handed back their CDRS-R scores (n=18) or their ICD-10 diagnosis (n=14) respectively. Clinical experience ranged between 0 and 12 years (mean: 3.05 years, SD: 4.07). 10 out of 32 participants were familiar with the CDRS-R.

CDRS-R mean raw score was 36.61 (SD: 5.07; range: 28-46; median: 35.5). The internal consistency was still satisfactory (Cronbach's $\alpha = 0.71$), but lower than in the first sample and probably weakened by the two items without variance. Several items show medium to high values, while others were rated close to 1 and two items (item 4 and 7) were consistently rated with 1 (details on the CDRS-R items are provided in Table 2). Years of clinical experience were not significantly correlated with CDRS-R scores (Spearman's $\rho = -0.26$, n.s.).

CGI-S mean score was 2.96 (SD: 1.0; range: 1-5), with years of clinical experience not being significantly correlated with CGI-S score (Spearman's $\rho = -0.02$, n.s.). CGI-S score was correlated with CDRS-R raw score (Spearman's $\rho = 0.55$, $P = 0.04$).

Clinical ICD-10 diagnosis was rated by 14 participants and coded accordingly (0=no diagnosis of depression, 1=mild, 2=moderate, 3=severe depression). Out of the group, who rated clinically according to ICD-10, 5 participants (35.7%) rated no depression, 7 rated the case as mild depression (50%) and 2 (14.3%) rated it as moderate depression, with a mean score of 0.77 (SD=0.73; range: 0-2) being below the level of mild depression. CGI-S score was significantly correlated with severity of ICD-10 diagnosis (Spearman's $\rho = 0.59$, $P = 0.03$). Years of experience were not corre-

lated with ICD-10 diagnostic level (Spearman's $\rho = 0.34$, n.s.)

Discussion

We conducted a study on CDRS-R raw scores in relation to ICD-10 clinical diagnosis of depression to provide a comparison how clinical estimation of mild to moderate depression is correlated with scores of this frequently used assessment instruments. So far, a CDRS-R score of ≥ 40 was used as an indicator for depression in relation to DSM-IV MDD in several studies.² As the distinction between mild, moderate and severe depression according to ICD-10 in relation to CDRS-R scores has so far not been established, we sought to determine a comparison based on a standardized video tape of an adolescent being interviewed using the CDRS-R. The mean raw scores of CDRS-R ratings of two independent rater groups were comparable (39.05 vs. 36.61 respectively), with the median scores even more closely comparable (37 vs 35.5). We found, that a CDRS-R raw score of approximately 37 points, was an indicator for a clinically derived diagnosis of mild to moderate depression in nearly 2/3 of the raters. The mean ratings for clinical diagnosis were slightly below the level of a mild depressive episode. We also sought for a diverse group of raters, finding, that the level of clinical experience did not affect the rating of the video tape. Based on our findings we would suggest, that a CDRS-R raw score band between 35 and 40 should be taken as indicative of mild to moderate depression according to the ICD-10. This may be of use to inform further studies using the CDRS-R as measure of depressive symptomatology. Limitations include the small size of the rater sample as well as the diversity of the group. However, the CDRS-R ratings were comparable to the ratings found in the previous group that was used to establish standardization of the video sam-

Table 2. Descriptives of CDRS items and sum score.

Item	mean	SD
CDRS-R 1	1.39	0.98
CDRS-R 2	1.61	0.61
CDRS-R 3	5.22	1.17
CDRS-R 4	1	0
CDRS-R 5	1.61	0.7
CDRS-R 6	1.06	0.24
CDRS-R 7	1	0
CDRS-R 8	2.56	0.78
CDRS-R 9	1.06	0.24
CDRS-R 10	1.39	0.5
CDRS-R 11	2.94	0.87
CDRS-R 12	2.89	1.18
CDRS-R 13	3.33	0.69
CDRS-R 14	3	0.91
CDRS-R 15	2.5	0.79
CDRS-R 16	1.72	0.67
CDRS-R 17	2.33	0.49
CDRS sum score	36.61	5.07

CDRS-R, Children's Depression Rating Scale-Revised.

ple. As CDRS-R scores and ICD-10 diagnosis were not rated by the same persons, it is not possible to correlate these measures directly. We chose this approach to allow the raters to fully concentrate on their respective task. Another limitation is the use of only one interview, which was rated. It would be interesting to compare the CDRS-R based on more interviews. However, given the small size of the rater group, this approach didn't seem to be feasible. Despite the abovementioned limitations, this is the first study to try to bridge the gap between scores as measured by a scientifically highly relevant research instrument and clinical diagnosis.

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