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How do we measure psychiatric diagnoses? Implications of the choice of instruments in epilepsy

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Abstract

We evaluated several commonly used screening instruments for the detection of mood disorders, anxiety disorders, and attention deficit hyperactivity disorder (ADHD). These were compared to criterion-based standardized questionnaire, the Diagnostic Interview Survey (DIS) IV, designed to make DSM-IV-TR diagnoses in the community-based study of childhood-onset epilepsy. The DIS-IV was administered to young adult cases with epilepsy at a 15-year follow-up assessment and compared to symptoms screens administered at the same visit, and at a previous 9-year assessment. Among cases, the specificity of the DIS-IV ranged from 0.77 to 0.99 and the predictive value of a negative psychiatric diagnosis was similarly high. Sensitivity was lower, ranging from 0 to 0.77, with correspondingly low predictive value of a positive diagnosis. Symptom-based instruments assess current symptom burden and are useful for determining associations with ongoing seizures or quality of life. Criterion-based standardized interviews, such as the DIS-IV, provide psychiatric diagnoses over the lifetime, which is most useful in studies of epilepsy genetics and studies of comorbidities and prognosis of epilepsy.

Keywords

psychiatric disorders; prevalence; validity

Psychiatric disorders are an important comorbidity in epilepsy [1, 2]. Instruments used to assess these disorders in epilepsy have included structured and semi-structured interviews designed to make a DSM-IV-TR diagnosis, such as the Diagnostic Interview Schedule for Children (DISC)[3], the Schedule for Affective Disorders and Schizophrenia for School-Age

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Children (K-SADS) [4], and the Structured Clinical Interview for DSM Disorders (SCID) [5]. More commonly, single questions or symptom checklists are used as screening instruments and analyzed as a continuous measure of symptom severity or by applying a cut off to approximate a DSM diagnosis. Such measures may be used to determine treatment response and remission in clinical trials [6]. Often they are used and interpreted as measures of psychiatric diagnoses; however, this is not their intended use. These instruments include the Child Behavior Checklist (CBCL)[7], the Beck Depression Inventory-II (BDI-II) [8], and the Beck Anxiety Inventory[9].

The DIS-IV [3] is a criterion-based standardized questionnaire designed to make DSM-IV-TR diagnoses. We evaluated the validity of the gold standard DIS-IV DSM-IV-TR diagnoses compared to commonly used symptom scales (e.g., CBCL, BDI-II) and to parental and young adult (YA) questionnaires for ascertaining mood disorders, anxiety disorders, and attention deficit hyperactivity disorder (ADHD) in the Connecticut Study of Epilepsy. This community-based incidence cohort of childhood onset epilepsy has been studied using different instruments at two different time points. Because different measures of the same or similar disorders have been used, the study provides an opportunity to compare the yield, sensitivity and specificity of different methods for assessing psychiatric diagnoses in an epidemiological study and the implications for the choice of method. As our primary goal was to examine the sensitivity and specificity of various screening instruments with respect to the DIS-IV diagnostic questionnaire, we performed an analysis of cases with childhood onset epilepsy.

METHODS

Cases identified with incident epilepsy in childhood were recruited from the offices of pediatric neurologists, pediatricians and adult neurologists throughout the state of Connecticut from 1993–1997 [10]. Parents were interviewed at baseline. Follow-up calls for further seizures were conducted every 3 to 4 months throughout the course of follow-up. At 8–9 years after initial study entry, cases and their parents were invited to participate in reassessment, including parental questionnaires. About 15 years after recruitment, a YA assessment was performed on cases who attained the age of majority. The YA questionnaire at the 15 year assessment was similar to the 9-year the parent questionnaire (Table 1).

At the YA assessment, the DIS-IV was administered to assess lifetime and recent DSM-IV-TR diagnoses of mood disorders, anxiety disorders, and ADHD [3, 11]. The DIS-IV was administered by two trained interviewers. The Beck Depression Inventory (BDI-II) [8], Beck Anxiety Inventory (BAI)[9], and Adult Self Report (ASR) of the Achenbach System of Empirically Based Assessment [7] were administered to consenting adult cases with childhood onset epilepsy (Table 1).

The following DIS-IV diagnoses were considered: ADHD; lifetime and recent anxiety disorder; lifetime and recent mood disorder; and lifetime and recent anxiety disorder or mood disorder (Table 1). Mild, moderate, and severe cut offs were examined for the BDI-II [6, 8]and the BAI [12]. We used the DSM-oriented current diagnoses of affective disorder, anxiety disorder, affective or anxiety disorder and ADHD for the CBCL [7] and the ASR[7].

The parental questionnaire at the 9-year follow-up queried whether the child had ever had depression and ADHD; the YA questionnaire at the 15-year follow-up queried whether the YA had ever been diagnosed with depression, anxiety, and ADHD.

We studied the cases in order to compare the sensitivity and specificity as well as predictive values of various screens and questionnaires to a criterion based diagnostic interview in epilepsy. The proportion of cases with each psychiatric disorder was calculated across instruments for the 9-year and the 15-year follow-up. The DIS-IV diagnoses were compared to the parent questionnaire and DSM-oriented diagnoses on the CBCL at the 9 year follow-up and to the young adult questionnaire, DSM-oriented diagnoses on the ASR, BDI-II cut offs [13], and the BAI cut offs [14]. The CBCL DSM-IV categories at the 9-year assessment were compared to the lifetime diagnoses of the DIS-IV because they were indicators of past conditions. The ASR diagnostic categories at the 15 year follow-up were compared to current and lifetime diagnoses on the DIS-IV.

Sensitivity, specificity and positive predictive value were computed using the DIS-IV diagnoses as the gold standard; exact 95% confidence intervals were calculated. Sensitivity was defined as the proportion of cases with a diagnosis on the symptom scales or questionnaires who were correctly identified as true positives on the DIS-IV, and specificity as the proportion without a diagnosis on the symptom scales or questionnaires who were correctly identified on the DIS-IV. Positive predictive value (PPV) was defined as the proportion of cases with a psychiatric disorder on the symptom screens or questionnaires who were diagnosed on the DIS-IV, and negative PV as the proportion without a psychiatric disorder on the symptom screens or questionnaires who were not diagnosed on the DIS-IV.

RESULTS

These analyses are based on the 239 cases with childhood onset epilepsy that had been interviewed using the DIS-IV. The median age at epilepsy onset was 6.8 years (IQR: 4.2–9.3). Among participants, the median age at the DIS-IV interview was 22.2 years (IQR: 20–25.3) and 50.6% were male. Almost all cases (N=238) with the DIS-IV also had a 9-year parental questionnaire and 163 (68.2%) had parent-completed 9-year CBCL (Table 1). All cases completing the DIS-IV also completed a 15-year YA questionnaire, 226 (94.6%), the BDI-II and the BAI, and 225 (94.1%) completed the ASR.

Prevalence of mood disorder, anxiety disorder, and ADHD

According to our gold standard measure, the DIS-IV, the lifetime prevalence was 19.7% for mood disorder, 20.2% for anxiety disorder, and 5.4% for ADHD in participants (Table 2). For recent psychiatric disorders, the prevalence was 11.7% for mood disorder and 6.3% for anxiety disorder.

We compared the parent questionnaire for lifetime disorders to the DIS-IV (Table 2). The percentage with mood disorder was lower on the parent questionnaire (12.6% vs. 19.7%). In contrast, parents reported more ADHD than young adults reported on the DIS-IV (13% vs. 5.4%). When similar comparisons were made between the YA questionnaire and the DIS-IV, the prevalence of mood disorder was similar (18% vs. 19.7%). Compared to the DIS-IV,

the prevalence of recent depression was 3.5% using the severe BDI-II cut off and 5.3% for recent anxiety using the severe BAI cut off. In a similar comparison, lifetime anxiety disorder was lower (12.6% vs. 20.2%), and lifetime ADHD was higher (17.2% vs. 5.4%) on the YA questionnaire than on the DIS-IV.

Diagnoses of recent psychiatric disorders on the DIS-IV were compared to the DSM-oriented diagnoses on the ASR. Recent depression was more common on the DIS-IV than on the ASR (11.7% vs. 7.6% on the ASR). Recent anxiety was more common on the DIS-IV than on the ASR (6.3%, versus 3.6% respectively). Lifetime ADHD was most common on the ASR (7.1%) compared to the DIS-IV (5.4%).

Validity of the DIS-IV psychiatric diagnoses

Compared to the gold standard DIS-IV, the screening instruments and questionnaires tended to have low sensitivity and high specificity (Table 3). The BDI-II, BAI, CBCL, and ASR failed to identify disorders identified by the DIS-IV. On the other hand, cases who did not have disorders according to the DIS-IV were also likely to not have a diagnosis on the other instruments.

In general, mood disorders were under recognized on self-reported measures and symptom screens compared to the DIS-IV. About 70% of depression on the DIS-IV was recognized by self-report and <50% was recognized by symptom screens.

Sensitivity—At the 15-year assessment, sensitivity was low for all DSM-oriented diagnoses on the ASR, and for the moderate and severe cut offs for the BDI-II and BAI, ranging from 23% for mood disorder on the severe cut off for the BDI II to 68 % for mild mood or anxiety disorders on the BAI. Sensitivity was higher for the young adult questionnaire report of lifetime diagnoses ranging from 42% for anxiety to 77% for ADHD.

The sensitivity of the CBCL at the 9-year assessment ranged from 0% for DSM-oriented ADHD to 26% for DSM-oriented depression/anxiety. Sensitivity of the parent questionnaire ranged from 47% for mood disorders to 69% for any ADHD.

Specificity—Across psychiatric constructs, the specificity of all instruments was high at the 15-year assessment, ranging from 77% for the combined BDI/BAI mild cut off to 99% for the severe cut off for depression on the BDI-II. On the young adult questionnaire, specificity ranged from 86% for any ADHD to 95% for lifetime anxiety.

At the 9-year assessment, specificity was 90% or greater for all CBCL measures and for the parent questionnaire.

Positive Predictive Value (PPV)—Overall, detection of those with positive diagnoses on the DIS-IV was poor. The PVP ranged from 17% for the mild cut off for anxiety on the BAI to 75% for the severe cut off for mood disorder on the BDI-II for 15-year assessment instruments. For the young adult questionnaire, the PVP ranged from 24% for ADHD to 77% for mood and anxiety disorder.

For the 9-year assessment, the PVP ranged from 0% for ADHD to 63% for depression on the CBCL. PVP was 29% for ADHD and 73% for depression on the parent questionnaire.

The PVP is greatly influenced by the prevalence of the disorder in the population under study, and the prevalence of ADHD was lower than the prevalence of mood disorder or anxiety disorder in our study.

Negative Predictive Value (NPV)—When the DIS-IV was compared to other instruments, the NPV was high, ranging from 79% for recent depression and/or anxiety on the CBCL to 98% for ADHD on the YA and parent questionnaires. Most NPV values were 90% or greater, reflecting the high degree to which the absence of a diagnosis on the different instruments was concordant with the absence of a diagnosis on the DIS-IV.

DISCUSSION

Compared to a standardized instrument designed to make DSM-IV diagnoses, commonly used screening instruments and parent- or self-reported history of selected psychiatric disorders in epilepsy were found to have relatively poor sensitivity, reflecting a large proportion of false negatives, for several conditions. These included ADHD, DSM-oriented depression, DSM-oriented anxiety and anxiety on the YA questionnaire. In contrast, the specificity was high for most comparison, reflecting a large proportion of true negatives.

Not only do the instruments we used differ by whether or not they make a DSM diagnosis, they also differ by the nature of the respondent. Parents report primarily or exclusively observable symptoms manifested by their children when responding to the CBCL, whereas the cases report about both observable and subjective symptoms on the DIS, BDI-II, BAI, and ASR. Thus, it is expected that parents might report on externalizing disorders more than on internalizing disorders but cases are good reporters of both

We found a low sensitivity of the CBCL and the ASR compared to the DIS-IV diagnosis with a corresponding high specificity. Similar patterns have been seen when comparing the CBCL to the Diagnostic Interview Schedule for Children (DISC) [15, 16] and to the K-SADS [17]. Such work has not been done on the ASR which is a self-reported instrument. ASR-DSM-oriented diagnoses are no better than ASR-syndrome diagnoses, such as internalizing or externalizing disorders, on the CBCL [18] in distinguishing a clinical diagnosis of ADHD and of depression. However, DSM-oriented diagnoses for anxiety corresponded somewhat better to DIS- diagnoses. Some of the difficulty in distinguishing the behavior of the DSM-oriented diagnoses and the syndrome diagnoses has been attributed to the set number of items available when the CBCL was first created. Consequently, the CBCL may miss people who have symptoms of DSM-oriented diagnoses that are not included in the CBCL and ASR. Similar to our results using the DIS-IV as the gold standard in cases with epilepsy, the sensitivity and positive predictive value of the CBCL was low and specificity high compared to the DISC for depression and/or anxiety and for ADHD and/or oppositional disorder [19] in a chronic disease population with cancer, systemic fibrosis, inflammatory bowel disease or diabetes mellitus. Together our data and these

studies suggest that the CBCL, though less optimal for clinical screening, may hold some promise in the research setting because the specificity is high.

Others have found that the BAI is best able to detect panic disorder [12] rather than anxiety disorders as a whole, which may compromise its utility. Additionally the BAI and BDI-II share common dimensions of general distress, whereas cognitive terms, such as problems with concentration are a specific depression dimension on the BDI-II and physiological hyperarousal, including pounding or racing heart, is a specific anxiety dimension on the BAI [20]. Among patients with chronic epilepsy, the specificity of the BDI-II cut off of greater than 15 for mild depression was 80% and the sensitivity was 96.2% when compared to the MINI International Neuropsychiatric Interview, whereas the specificity of the BDI-II cut off of >15 was 87.5% and the sensitivity 84.0% when compared to the SCID [21]. The specificity reported in our study was similar to that reported by Jones et al [21], but our sensitivity was lower using each of the proposed cut offs for mild, moderate and severe depression on the BDI-II.

In a comparison with a psychiatrist's diagnosis of DSM-III disorders in a mixed population of psychiatric and non-psychiatric patients [11], the sensitivity of the DIS-III lifetime diagnoses ranged from 63% to 80% for depression, panic disorder and obsessive compulsive disorder. The range of specificity for these disorders was 84% to 95% [11].

The prevalence of lifetime diagnoses reported through interviews that asked the subjects to think back over their lifetime yielded a lower prevalence than has been reported when the cumulative incidence of disorders is assessed from serial interviews for current psychiatric disorders[22]. However the lifetime occurrence of psychiatric disorders ascertained in this manner is more than two-fold that reported in other studies conducted in the same manner as our study [23].

Conclusions

We found that sensitivity was low for most screening instruments with the exception of the mild cut off for the BDI-II and the BAI. Screening instruments can only ascertain current psychiatric status, whereas standardized interviews designed to make a DSM-IV diagnosis of psychiatric disorders can ascertain lifetime and current disorders. In studies assessing genetics of epilepsy comorbidities and prognosis of epilepsy, lifetime disorders provide the needed epilepsy phenotype. In these situations standardized interviews that make a DSM diagnosis are recommended in lieu of screening instruments. There are also advantages in using self-report, parent-completed forms, and self-completed symptom screening lists, especially in large studies in which these forms enable standardized assessment of the prevalence of symptom severity and DSM-oriented diagnoses. Clearly, the selection of instruments must be made considering the study questions and the associated instrument costs.

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Highlights

The DIS-IV assessed lifetime and current DSM-IVTR diagnoses in epilepsy

The DIS-IV was compared to screening instruments and single questions across diagnoses

Specificity was high and sensitivity low for the DIS-IV in epilepsyparticipants

CBCL and ASR DSM-oriented diagnoses do not adequately identify DSM diagnoses

Instrument selection must consider the study questions and instrument costs

Table 1

Instruments used to assess psychiatric disorders at the 9- and 15-year follow-up assessments

Instrument	Administration	Disorders Assessed	Number of cases with questionnaire
Nine year follow-up assessment			
Parent Questionnaire for psychiatric disorders	Trained interviewer	Single questions for: Lifetime depression Lifetime ADHD	238
Child Behavior Checklist	Parent completed	DSM-oriented ADHD DSM-oriented recent depression DSM-oriented recent anxiety	163
Fifteen year follow-up assessment			
Diagnostic Interview Survey-IV	Trained interviewer administered the structured interview	Lifetime ADHD Lifetime and recent mood disorder Lifetime and recent anxiety disorder	239
Young Adult Questionnaire for psychiatric disorders	Trained interviewer	Single questions for: Lifetime depression Lifetime anxiety Lifetime ADHD	239
Adult Self Report from the Aschenbach System of Empirically Based Assessment	Self-completed	DSM-oriented ADHD DSM-oriented recent depression DSM-oriented recent anxiety	225
Beck Depression Inventory-II	Self-completed	Recent depression categorized as: Mild, cut off 14–19 Moderate, cut off 20–28 Severe, cut off 29	226
Beck Anxiety Inventory	Self-completed	Recent anxiety categorized as: Mild, cut off 8–15 Moderate, cut off 16–25 Severe, cut off 26	226

ADHD – Attention Deficit Hyperactivity Disorder; DSM- Diagnostic and Statistical Manual

Table 2

DSM disorders in cases with epilepsy on the Diagnostic Interview Schedule (DIS-IV), Child Behavior Checklist (CBCL), Adult Self Report (ASR), Young adult questionnaire, Parent questionnaire, Beck Depression Inventory-II (BDI-II) and Beck Anxiety Inventory (BAI)

Disorders and instruments	Cases N (%)
Mood disorder	
15 year follow-up	
<i>Lifetime mood disorder</i>	
Lifetime mood disorder (DIS-IV)	47 (19.7)
Lifetime major depression (DIS-IV)	45 (18.8)
Lifetime bipolar disorder (DIS-IV)	10 (4.2)
Lifetime depression (YA questionnaire)	43 (18)
<i>Recent mood disorder</i>	
Recent DSM-oriented depression (ASR)	17 (7.6)
Recent mood disorder (DIS-IV)	28 (11.7)
Mood disorder (BDI cut off mild vs. not mild) *\$	36 (15.9)
Mood disorder (BDI cut off moderate vs. not moderate) **\$	17 (7.5)
Mood disorder (BDI cut off severe vs. not severe) ** \$	8 (3.5)
9 year follow-up	
Lifetime depression (parent questionnaire)	30 (12.6)
Recent DSM-oriented depression (CBCL)	8 (4.9)
Anxiety disorder	
15 year follow-up	
<i>Lifetime anxiety disorder</i>	
Lifetime anxiety disorder (DIS-IV)\$	48 (20.2)
Lifetime anxiety (YA questionnaire)	30 (12.6)
<i>Recent anxiety disorder</i>	
Recent DSM-oriented anxiety (ASR)	8 (3.6)
Recent anxiety disorder (DIS-IV)	15 (6.3)
Anxiety (BAI cut off mild vs. not mild) *	53 (23.5)
Anxiety (BAI cut off moderate vs. not moderate) **	21 (9.3)
Anxiety (BAI cut off severe vs. not severe) ***	12 (5.3)
9 year follow-up	
Recent DSM-oriented anxiety (CBCL)	15 (9.2)
Mood disorder or Anxiety	
15 year follow-up	
<i>Lifetime mood or anxiety disorder</i>	
Lifetime mood or anxiety disorder (DIS-IV)	69 (28.9)
Lifetime depression or anxiety (YA)	52 (21.8)

Disorders and instruments	Cases N (%)
<i>Recent mood or anxiety disorder</i>	
Recent mood or anxiety disorder (DIS-IV)	33 (13.8)
Recent DSM-oriented depression or anxiety (ASR)	21 (9.3)
Recent depression or anxiety cut off mild (BDI-II/BAI) *	65 (28.8)
Recent depression or anxiety cut off moderate (BDI-II/BAI) **	28 (12.4)
Recent depression or anxiety cut off severe (BDI-II/BAI) ***	17 (7.5)
9 year follow-up	
Lifetime DSM-oriented depression or anxiety (CBCL)	18 (11.0)
Attention deficit hyperactivity disorder (ADHD)	
15 year follow-up	
<i>Lifetime ADHD</i>	
Lifetime ADD/ADHD (DIS-IV)	13 (5.4)
Lifetime DSM-oriented ADHD (ASR)	16 (7.1)
Lifetime ADHD (YA questionnaire)	41 (17.2)
9 year follow-up	
DSM-oriented ADHD (CBCL)	6 (3.7)
Any ADHD (parent questionnaire)	31 (13.0)

* Mild cut off BDI: 14–19; BAI 8–15

** Moderate cut off BDI: 20–28; BAI: 16–25

*** Severe BDI-II cut off 29; BAI 26

ADD: Attention deficit disorder

\$₁ with missing information

Table 3

Sensitivity, Specificity, Positive Predictive Value (PPV), And Negative Predictive Value (NPP) Comparing The Diagnostic Interview Survey-IV (DIS-IV) To Other Instruments For Diagnoses Of Attention Deficit Hyperactivity Disorder (ADHD), Mood Disorder And Anxiety Disorder in cases with epilepsy

	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Lifetime ADHD in cases				
15 year follow-up				
ADHD - YA questionnaire	0.77 (0.46–0.95)	0.86 (0.81–0.90)	0.24 (0.12–0.40)	0.98 (0.96–1.0)
DSM-oriented ADHD - ASR	0.25 (0.05–0.57)	0.94 (0.90–0.97)	0.19 (0.04–0.46)	0.96 (0.92–0.98)
9 year follow-up				
DSM-oriented ADHD - CBCL	0	0.96 (0.92–0.99)	0	0.94 (0.89–0.97)
ADHD - Parent questionnaire	0.69 (0.39–0.91)	0.90 (0.86–0.94)	0.29 (0.14–0.48)	0.98 (0.95–0.99)
Mood disorders in cases				
15 year follow up (lifetime diagnosis)				
Depression - YA questionnaire	0.68 (0.53–0.81)	0.94 (0.90–0.97)	0.74 (0.59–0.86)	0.92 (0.88–0.96)
15 year follow up (recent diagnosis)				
DSM-oriented depression - ASR	0.27 (0.12–0.48)	0.95 (0.91–0.98)	0.41 (0.18–0.7)	0.91 (0.86–0.94)
BDI-II mild cut off*	0.50 (0.30–0.70)	0.89 (0.83–0.93)	0.36 (0.21–0.54)	0.93 (0.89–0.96)
BDI-II moderate cut off**	0.42 (0.23–0.63)	0.97 (0.94–0.99)	0.65 (0.38–0.86)	0.93 (0.88–0.96)
BDI-II severe cut off***	0.23 (0.09–0.44)	0.99 (0.96–1.0)	0.75 (0.35–0.97)	0.91 (0.86–0.94)
9 year follow up (lifetime diagnosis)				
Depression - Parent questionnaire	0.47 (0.32–0.62)	0.96 (0.92–0.98)	0.73 (0.54–0.88)	0.88 (0.83–0.92)
9 year follow up (recent diagnosis)				
DSM-oriented depression - CBCL	0.16 (0.05–0.34)	0.98 (0.94–1.0)	0.63 (0.24–0.91)	0.83 (0.76–0.89)
Anxiety disorders in cases				
15 year follow up (lifetime diagnosis)				
Anxiety - YA questionnaire	0.42 (0.28–0.57)	0.95 (0.91–0.98)	0.69 (0.49–0.85)	0.87 (0.81–0.91)
15 year follow up (recent diagnosis)				
DSM-oriented anxiety - ASR	0.29 (0.08–0.58)	0.98 (0.95–0.99)	0.50 (0.16–0.84)	0.95 (0.92–0.98)
BAI mild cut off*	0.64 (0.35–0.87)	0.79 (0.73–0.85)	0.17 (0.08–0.30)	0.97 (0.93–0.99)
BAI moderate cut off**	0.43 (0.18–0.71)	0.93 (0.89–0.96)	0.29 (0.11–0.52)	0.96 (0.92–0.98)
BAI severe cut off***	0.36 (0.13–0.65)	0.97 (0.93–0.99)	0.42 (0.15–0.72)	0.96 (0.92–0.98)
9 year follow up (lifetime diagnosis)				
DSM- oriented anxiety - CBCL	0.19 (0.06–0.38)	0.93 (0.87–0.96)	0.33 (0.12–0.62)	0.85 (0.78–0.90)
Mood or anxiety disorders in cases				
15 year follow up (lifetime diagnosis)				
Depression/Anxiety - YA questionnaire	0.58 (0.45–0.70)	0.93 (0.88–0.96)	0.77 (0.63–0.87)	0.84 (0.78–0.89)
15 year follow up (recent diagnosis)				
DSM-oriented depression/anxiety - ASR	0.35 (0.19–0.55)	0.95 (0.91–0.98)	0.52 (0.30–0.74)	0.90 (0.85–0.94)

	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
BDI/BAI mild cut off*	0.68 (0.49–0.83)	0.77 (0.71–0.83)	0.32 (0.21–0.45)	0.94 (0.89–0.97)
BDI/BAI moderate cut off**	0.48 (0.30–0.67)	0.93 (0.89–0.96)	0.54 (0.34–0.72)	0.92 (0.87–0.95)
BDI/BAI severe cut off***	0.35 (0.19–0.55)	0.97 (0.93–0.99)	0.65 (0.38–0.86)	0.90 (0.86–0.94)
9 year follow up (recent diagnosis)				
DSM- oriented depression/anxiety - CBCL	0.26 (0.14–0.42)	0.94 (0.88–0.98)	0.61 (0.36–0.83)	0.79 (0.71–0.85)

* Mild cut off: BDI 14–19; BAI 8–15

** Moderate cut off: BDI 20–28; BAI: 16–25

*** Severe cut off: BDI-II 29; BAI 26