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Improving early detection of childhood depression in mental health care: The Children's Depression Screener (ChilD-S)

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ABSTRACT

Diagnosing childhood depression can pose a challenge, even for mental health specialists. Screening tools can aid clinicians within the initial step of the diagnostic process. For the first time, the Children's Depression Screener (ChilD-S) is validated in a mental health setting as a novel field of application beyond the previously examined pediatric setting. Based on a structured interview, DSM-IV-TR diagnoses of depression were made for 79 psychiatric patients aged 9–12, serving as the gold standard for validation. For assessing criterion validity, receiver operating characteristic (ROC) curves were calculated. Point prevalence of major depression and dysthymia was 28%. Diagnostic accuracy in terms of the area under the ROC curve was high (0.97). At the optimal cut-off point ≥ 12 according to the Youden's index, sensitivity was 0.91 and specificity was 0.81. The findings suggest that the ChilD-S is not only a valid screening instrument for childhood depression in pediatric care but also in mental health settings. As a brief tool it can easily be implemented into daily clinical practice of mental health professionals facilitating the diagnostic process, especially in case of comorbid depression.

1. Introduction

Childhood depression is highly prevalent in mental health care, with rates of 8–10% (Ling et al., 1970; Stegmann et al., 2013). Early recognition and timely treatment are crucial as childhood depression has negative effects on psychosocial functioning (Lima et al., 2013; Maughan et al., 2013) and increases the risk of developing other psychiatric disorders in later life (Copeland et al., 2013).

Yet, diagnosis of depression in children is challenging, even for mental health specialists. Compared to other psychiatric disorders, interrater-reliability between professionals of child and adolescents psychiatry is lowest for the diagnosis of depression (Blanz and Schmidt, 1990; Schmidt and Sinzig, 2006). The difficulty in making the correct diagnosis can be explained by the heterogeneous presentation of childhood depression. Unlike in the later course of development, the clinical impression of the symptomatology mostly is not a typical one. Often, anxiety and unspecific somatic symptoms that are not always easily traced back to depression are predominant (Garber et al., 1991). Only in adolescence, the clinical presentation approaches the characteristics of adulthood depression. In general, symptoms of depression are hard to be observed and especially young children struggle with giving insight in their inner life (Mehler-Wex, 2008). On top of this, childhood depression often occurs along with other mental disorders such as conduct disorders, hyperkinetic disorders and separation anxiety disorder (Breton et al., 2012; Ryan et al., 1987). Comorbid depression is often shadowed by these more prominent disorders (Nijdam, 1986). The best method to assess comorbid disorders is the conduction of structured interviews that are rarely applied in clinical practice as they are comprehensive and time-consuming (Bruchmüller et al., 2011). Instead, mental health professionals rather rely on their clinical judgement, running the risk that the further exploration is led by their first impression (Crumlish and Kelly, 2009; Nath and Marcus, 2006). As a result, comorbid disorders are missed (Zimmerman and Mattia, 1999, 2001) since disorder-specific questionnaires are not applied (Zimmerman and Mattia, 2001).

Given this, short and time-economic diagnostic instruments such as screening tools can facilitate the diagnostic process. In a second step, children who scored positively on the screener can be followed-up by a further clinical exploration to verify or falsify a diagnosis of depression.

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For the use in children, screening tools ideally have a simple wording and answering format.

There are only two depression-specific screening instruments that have solitarily been validated in children. The Children's Depression Inventory Short Version (CDI:S, Kovacs, 2003) and the Short Mood and Feelings Questionnaire (MFQ-SF, Angold et al., 1995) yielded good diagnostic accuracy in medical settings (Allgaier et al., 2012; Katon et al., 2008). To the best of our knowledge, both screening tools have not been investigated in a mental health setting so far. The only study in a psychiatric setting using the full-version of the CDI found a low recognition rate of depression of 0.63 (Sorensen et al., 2005). Apart from disorder-specific screening tools there are other instruments covering a broader spectrum of mental disorders including subscales for depression, such as the Revised Child Anxiety and Depression Scale (RCADS, Chorpita et al., 2000). Again, only 74% of the subjects in a clinical sample were correctly classified as depressed by the RCADS (Chorpita et al., 2005). Yet, this clinical sample did not only include children but also adolescents.

In sum, none of these instruments yielded a satisfying performance in detecting depression in mental health care. Our newly developed screening tool, the Children's Depression Screener (ChilD-S, Frühe et al., 2012), reached a high recognition rate of 0.91 in pediatric hospital patients aged 9–12. Based on these previous findings showing that the ChilD-S discriminates well between depression and somatic disorders, the current study aimed at investigating if it can also differentiate between childhood depression and other mental disorders. For this purpose, the ChilD-S was validated in a mental health care sample.

2. Methods

2.1. Procedure

Subjects were recruited in five institutions in the field of child and adolescent psychiatry, psychotherapy or psychosomatic medicine in Munich, Germany, covering outpatient care, inpatient treatment and day care units. The recruitment phase started in May 2010 and concluded in March 2011.

Children had to fulfill four inclusion criteria to be considered for participation: they had to be between 9 and 12 years of age (1), the diagnosis or treatment of any mental disorder had to be the reason for attending a psychotherapist (2) and they had to have sufficient cognitive (3) as well as sufficient language skills (4) to complete both the screener and the interview.

A member of the study group informed the children and their parents about the study shortly after the first appointment at the institution to ensure that the families would not have been informed about the diagnoses made by the institution's mental health professionals yet.

If written informed consent was given by both the child and the parent, the child answered the items of the screener. Subsequently, two diagnostic interviews were conducted, one with the child and one with the parent, each performed by a different interviewer. The interviews took place within 2 weeks after the first contact and were carried out by one psychologist and two psychology students. All of them were trained in performing the interview and supervised by the first author of the study. The interviewers were blind towards the screening results until after the end of the interview. Fleiss' κ was calculated on the basis of eight audiotapes to judge interrater-agreement between the three interviewers, which proved to be high (0.88).

If parents and children agreed, the interviewers and the institution's psychotherapist exchanged their diagnoses after all diagnoses had been made independently. A 20€ shopping voucher was given to children participating in the study. The presented research procedure fulfilled the Declaration of Helsinki guidelines and was approved by local ethics committees.

2.2. Measures

2.2.1. Children's Depression Screener

The Children's Depression Screener (ChilD-S) was developed by our research group addressing children aged 9–12. The ChilD-S comprises eight items covering various cognitive and emotional symptoms that were present lately. Originally designed for use in pediatric care, the screening tool does not inquire somatic complaints as corresponding items would not discriminate between somatically ill patients who are depressed and those who are not.

Answering format is a four-point scale (0–3) ranging from “agree” to “disagree” resulting in a maximum sum score of 24. Details of its construction have been described elsewhere (Frühe et al., 2012).

Psychometric properties of the ChilD-S have been proven in a sample of 406 pediatric hospital patients (Frühe et al., 2012): Cronbach's α was 0.81 and the item total correlations of all items were above the critical value of 0.30. Criterion validity was determined against DSM-IV-TR depression diagnoses (American Psychiatric Association, 2000) serving as the reference standard. Diagnoses were major depression and dysthymia as assessed by a structured interview (Kinder-DIPS, Schneider et al., 2009). Diagnostic accuracy represented by the area under the receiver operating characteristics curve was very high in the pediatric sample (AUC = 0.97). The number of correctly classified cases (sensitivity) was 0.91, whereas 0.89 were correctly identified as non-depressed (specificity) at the ideal cut-off point ≥ 11 (Frühe et al., 2012).

2.2.2. Diagnostic interview

In order to validate the screening instrument, diagnoses of depression based on the German structured clinical interview for mental disorders in children and adolescents (Kinder-DIPS, Schneider et al., 2009) were used as the gold standard. Reliability and validity of the Kinder-DIPS have been shown elsewhere (Adornetto et al., 2008; Schneider et al., 2009).

A depressive disorder was diagnosed if the child fulfilled the DSM-IV-TR criteria (American Psychiatric Association, 2000) for major depression or dysthymia. Thereby, a diagnosis was made as soon as the criteria for one of the above mentioned disorders were met in either the parent or the child interview. This procedure is recommended by the manual of the Kinder-DIPS.

2.3. Sample

A total of 153 children and their families were informed about the study, 98 gave written informed consent and the final sample consisted of 79 children. The exact patient flow is displayed in Fig. 1.

The mean age of participating children was 10.65 years (S.D. = 1.04). 52 (65.8%) of the children were boys, 27 (34.2%) were girls. Participants and non-participants did not differ significantly in terms of gender ($\chi^2(1) = 0.00$, $P = 1.00$) or age (Mann Whitney U-test: $P = 0.46$). Six non-participants were excluded from these analyses due to missing data.

Although most children (74.7%) were outpatients, there were some patients in day care (2.5%) and inpatients (5.1%), too. The remaining 17.7% were on a waiting list for day or inpatient care.

The most common disorders diagnosed by the institutions' mental health professionals were hyperkinetic disorders (32.9%), depressive disorders including dysthymia (22.8%), emotional disorders with onset specific to childhood (20.3%), anxiety disorders (19.0%), tic disorders (7.6%), somatoform disorders (6.3%), mixed disorders of conduct and emotion (6.3%) and conduct disorders (5.1%). Developmental disorders were diagnosed in 38.0% of the cases, predominantly learning

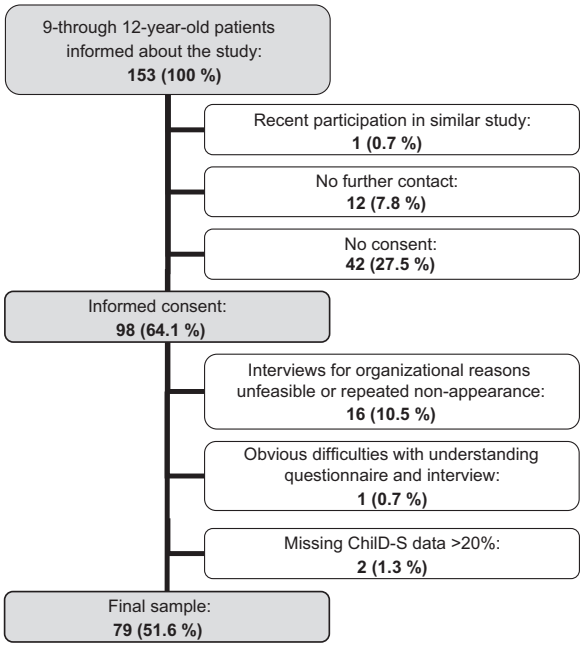

Fig. 1. Flow-chart of study enrollment.