

DSM-IV Disorders in Children With Borderline to Moderate Intellectual Disability. I: Prevalence and Impact

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ABSTRACT

Objective: To assess the prevalence, comorbidity, and impact of *DSM-IV* disorders in 7- to 20-year-olds with intellectual disability. **Method:** A total of 474 children (response 86.8%) were randomly selected from a sample of students from Dutch schools for the intellectually disabled. Parents completed the anxiety, mood, and disruptive disorder modules of the Diagnostic Interview Schedule for Children. **Results:** A total of 21.9% of the children met the *DSM-IV* symptom criteria for anxiety disorder, 4.4% for mood disorder, and 25.1% for disruptive disorder. Similar prevalence rates were found for children who screened positive or negative for pervasive developmental disorder. More than half of the children meeting the criteria for a *DSM-IV* disorder were severely impaired in everyday functioning, and about 37% had a comorbid disorder. Children with multiple disorders were more likely to be impaired across various areas of everyday functioning. Almost 27% of the diagnosed children received mental health care in the last year. Comorbidity and impairment in everyday functioning increased the likelihood of referral. **Conclusions:** Most disorders can be observed in intellectually disabled children. Impairment and comorbidity are high. The finding that less than one third of the children with a psychiatric disorder receive mental health care deserves attention. *J. Am. Acad. Child Adolesc. Psychiatry*, 2003, 42(8):915–922. **Key Words:** psychopathology, intellectual disability, comorbidity.

Psychopathology in children and adolescents with intellectual disability (ID) receives increasing attention from researchers and mental health practitioners alike. However, basic information on prevalence and impact of psychiatric disorders from well-designed epidemiological studies is scarce.

In the limited number of studies conducted thus far, prevalence estimates of *DSM-III(-R)* disorders in community-based samples of children with ID vary from 4% to 18% (Borthwick-Duffy and Eyman, 1990; Eaton and Menolascino, 1982; Jacobson, 1982; Rojahn et al., 1993). Even fewer studies present estimates of specific disorders. Prevalence estimates for attention-deficit hyperactivity disorder (ADHD) range from about 0.5% to 11%, for conduct disorder (CD), and oppositional defiant disorder (ODD) from 0.5% to 12%, for anxiety disorders from 0.5% to 10%, and for mood disorders from 0.5% to 4% (Gillberg et al., 1986; Myers and Pueschel, 1991; Rojahn et al., 1993). Surprisingly, these estimates are in the same range or even lower than those reported in many general population studies of children without ID (Anderson et al., 1987; Bird et al., 1988; Cohen et al., 1993; Costello et al., 1996b; McGee et al., 1990; Offord et al., 1987; Verhulst et al., 1997), which contrasts with the threefold to fourfold increased risk of deviant emotional and behavioral problems found in children with ID compared with non-ID children in studies using standardized rating scales (Dekker et al., 2002a; Koller et al., 1982; Linna et al., 1999; Rutter et al., 1970). A possible explanation for this discrepancy, apart from differences in defining and operationalizing psychopathology, might lie in the methods of data collection employed.

To this day, almost all information on *DSM* diagnoses in community-based studies of children with ID is gathered through clinical records, whereas studies focused on non-ID children make regular use of standardized instruments (e.g., Anderson et al., 1987; Bird et al., 1988). Clinical files often record a clinician's diagnosis without stating how and what kind of information was gathered. Furthermore, the presenting problems and cognitive disabilities of subjects are known to differentially influence

Accepted February 4, 2003.

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Supported by Sophia Scientific Foundation grant 206, the Health Research and Development Council grant 28-2724, and the Foundation of Friends of New Spraealand.

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0890-8567/03/4208-0915©2003 by the American Academy of Child and Adolescent Psychiatry.

DOI: 10.1097/01.CHL.0000046892.27264.1A

referral for psychiatric evaluation (Jacobson, 1982; Rojahn et al., 1993). Therefore, case file studies of persons known to ID services are likely to underestimate the true prevalence of psychopathology (Reiss, 1990).

The first aim of this study was to estimate the 1-year prevalence of anxiety disorders, mood disorders, and disruptive disorders (including ADHD) according to *DSM-IV* symptom criteria, and to assess demographic differences in prevalence in a community-based sample of children with borderline to moderate ID using a standardized instrument, i.e., the DISC-IV-P (Shaffer et al., 2000a,b).

In characterizing psychiatric disorders in children with ID, it is important to address their impact on everyday functioning. General population studies of non-ID children show that about one third to one half of the children who met the *DSM-IV* symptom criteria are significantly impaired in their everyday functioning (Anderson et al., 1987; Bird et al., 1988; Cohen et al., 1993; Costello et al., 1996b; McGee et al., 1990; Offord et al., 1987; Verhulst et al., 1997). This study assessed whether the same is true for children with ID.

A factor that might aggravate impairment in everyday functioning is the presence of a comorbid disorder. To this date, no information on comorbidity of psychiatric disorders in community-based studies of children with ID is available. Community-based studies of non-ID children show that the overall co-occurrence of disorders in those diagnosed ranges from about 25% to 55% (Anderson et al., 1987; Bird et al., 1988; Cohen et al., 1993; McGee et al., 1990; Verhulst et al., 1997), with the highest comorbidities between ADHD and CD, and between depressive disorder and anxiety disorder (Angold et al., 1999). The third goal of this study was to address comorbidity among children with ID. We also examined whether children who screened positive for pervasive developmental disorder (PDD) were more likely to have a comorbid anxiety, mood, or disruptive disorder than children who were screened negative.

A final objective was to evaluate mental health care utilization in children with ID. This paper details the proportion of children who received mental health care in the last year and addresses the effect of impairment and comorbidity on the probability of referral.

METHOD

This study consists of two data collection phases. The first one was initiated in 1997, and about 1 year later a second phase began. In the second phase, a random sample of the first phase responders were

contacted again to be interviewed at home. The study was approved by the Medical Ethical Committee of Erasmus MC Rotterdam.

Sample and Procedure

The target population consisted of all 6- to 18-year-olds who attended a school for ID in the province of Zuid Holland, the Netherlands. In September 1997, a 20% random sample of students ($N = 1,615$) was drawn from each of the 115 participating schools for ID (see also Fig. 1). Each school was sent sampling instructions and a table of random numbers based on the number of students in the previous school year. When we established our sampling frame in 1996, about 2% ($N = 48,800$) of all 6- to 18-year-old Dutch children attended a school for ID (about one fifth of them in Zuid Holland) because children with ID were unlikely to attend regular schools (Central Bureau of Statistics, 1999). About three fourths attend a school for the educable (IQ between 60 and 80) and one fourth a school for the trainable (IQ <60). Both groups were unlikely to have any severe additional physical or sensory handicaps.

Parents and caregivers of these children were sent a letter and a brochure about the research project through the schools and were contacted by the researchers, only after giving consent. All parents who participated in the study signed an informed consent form. To be included in this study, the children had to live at home for at least 4 days per week, and at least one parent had to have enough comprehension of the Dutch language to be interviewed (assessed by the interviewer after a personal conversation).

Of the first phase students, 141 were excluded from this study because of parental language problems, 7 because they exceeded the age range, and 71 because they had left school by the time the first data collection phase started. Of the 1,396 remaining eligible students, the research group could not contact the parents of 231 students, 164 parents refused to participate, and 33 of the participating parents did not fill out all included instruments. The final number of participants with valid scores was 968 (69.3% of all eligible and 83.1% of all parents who could be contacted in person).

About 1 year later, we contacted a random sample of 58% of first phase respondents for a second time (Table 1). The mean interval between the two phases was 409.6 days (standard deviation [SD] 79.9 days). Six families were excluded because they did not meet the language requirements for the more complicated diagnostic interview and 5 children were no longer living at home (eligible $N = 546$). We were not able to contact 11 parents a second time, 53 parents refused to participate, and 8 parents did not want to participate in the diagnostic interview. At the second phase, 474 home interviews were carried out (response 86.8%; 60.2% based on initial sample).

No significant ($p > .05$) differences were found between the original eligible first phase sample and the second phase sample in the distribution of sex ($\chi^2_1 = 3.1$), educational level ($\chi^2_1 = 4.1$), and year of birth ($\chi^2_{14} = 7.5$). Seventy-eight percent of the parents of all eligible children gave us information on their socioeconomic status (SES). No significant difference in SES was found between the sample of eligible children and the second phase sample ($\chi^2_1 = 2.2$). However, those parents who did not participate in any phase and who gave us information on SES ($N = 122$) were more likely to have low SES (68.9%) compared with the first phase participants (55.4%; $\chi^2_1 = 11.0$).

Comparing children whose parents participated in both phases to those who participated only in the first phase, no significant ($p > .05$) difference was found in the percentage of children scoring in the deviant range of the Total Problems scale ($\chi^2_1 = 0.8$), the Externalizing scale ($\chi^2_1 = 0.32$), and the Internalizing scale ($\chi^2_1 = 2.4$) of the CBCL, nor in the percentage of children scoring above the 75th percentile

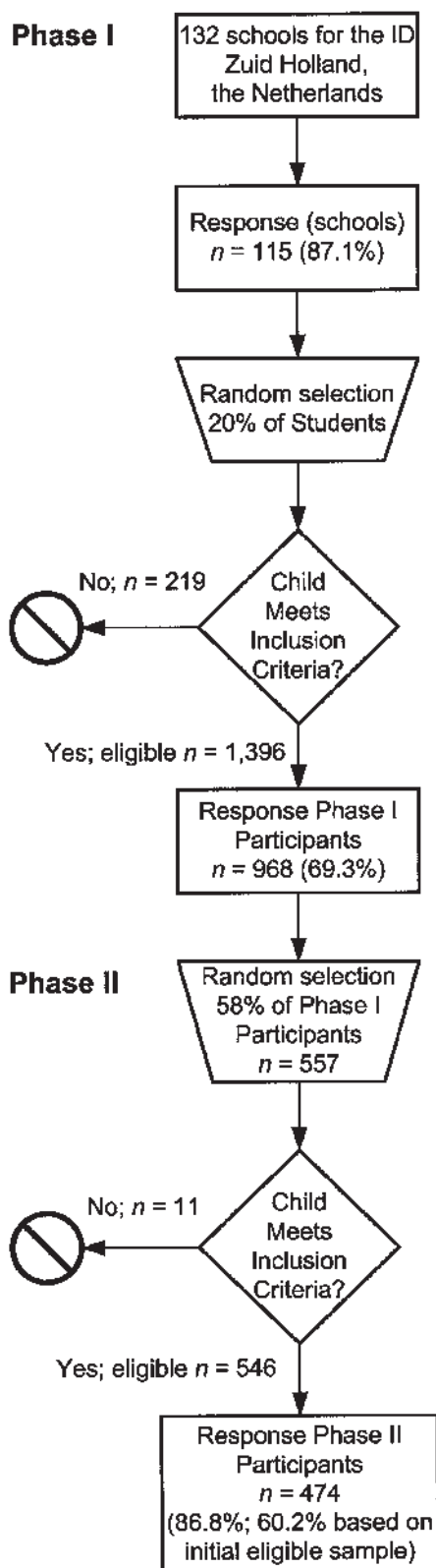


Fig. 1 Sampling procedure and response.

TABLE 1
Sample Characteristics

Characteristic	%
Educational level	
Educable	77.4
Trainable	22.6
Sex	
Male	61.8
Female	38.2
SES	
Low	49.9
Medium to high	50.1
Mean age, yr (SD)	12.9 (3.0)
Family	
Single parent	15.2
Complete	84.8
Ethnicity	
≥ 1 parent non-Dutch	11.5
Single or both parent(s) Dutch	88.5
Down syndrome	5.3
Epilepsy	5.5
Motor impairment	1.3
Sensory impairment (partially deaf/blind)	0.4

of the Total Problems scale ($\chi^2_1 = 0.2$) of the Developmental Behavior Checklist-Primary version.

Measures

The Diagnostic Interview Schedule for Children-Parent Version (DISC-IV-P) (Shaffer et al., 2000a) is designed to obtain DSM-IV diagnoses and to be administered by trained interviewers who need not have formal clinical training. Preliminary results on the DISC-IV showed that it has moderate to good test-retest reliability and moderate to good agreement with clinicians' ratings (Shaffer et al., 2000b). With the permission of the authors, the DISC-IV was translated into Dutch (by Ferdinand, van der Ende, and Mesman) following the original text as closely as possible. Interviewers were graduating or graduated university students from psychology (related) programs. They received a 4-day training at the DISC training center of Erasmus MC-Sophia Children's Hospital, the Netherlands. This training is similar to the DISC-IV training at Columbia University, New York. Both Dutch DISC-IV trainers were officially trained as trainers for the DISC-IV administration at the Columbia University, New York by P. Fisher.

This highly structured and reliable DISC-IV interview was chosen over a semi-structured interview, such as the Diagnostic Interview for Children and Adolescents (Reich, 2000) because of this study's sample size, time constraints, and the use of trained lay-interviewers. However, it is acknowledged that a structured interview lacks the possibility to seek clarification through follow-up questions to ensure understanding and accuracy.

No direct assessment components with the children were included in this study. Time and budget constraints, as well as a lack of any proven direct assessment method available to generate psychiatric diagnoses in children with ID without needing formal training, limited us to parents as informants.

This study focused on three major DISC-IV groupings of DSM-IV disorders, namely, anxiety disorders, mood disorders, and disruptive disorders (including ADHD, ODD, and CD; see Table 2 for a listing of the specific disorders). The DSM-IV diagnoses were derived

TABLE 2
Prevalence of Children Meeting *DSM-IV* Criteria With and Without Severe Impairment
in Everyday Life Functioning, and Percentage Who Received Mental Health Care

<i>DSM-IV</i> disorder	<i>DSM-IV</i> criteria		<i>DSM-IV</i> + impairment	
	% (\pm SE)	% help	% (\pm SE)	% help
Any <i>DSM-IV</i> disorder	38.6 (\pm 2.4)	26.8	21.7 (\pm 1.9)	40.8
Any anxiety disorder	21.9 (\pm 1.9)	16.3	10.5 (\pm 1.4)	28.0
Social phobia	2.5 (\pm 0.7)	33.3	1.9 (\pm 0.6)	44.4
Separation anxiety disorder	2.1 (\pm 0.7)	30.0	1.9 (\pm 0.6)	33.3
Specific phobia	17.5 (\pm 1.7)	2.4	6.8 (\pm 1.2)	6.3
Panic disorder without agoraphobia	0.2 (\pm 0.2)	0.0	0.2 (\pm 0.2)	0.0
Panic disorder with agoraphobia	0.4 (\pm 0.3)	50.0	0.2 (\pm 0.7)	100.0
Agoraphobia without panic disorder	1.3 (\pm 0.5)	0.0	1.1 (\pm 0.5)	0.0
Generalized anxiety disorder	0.0	—	0.0	—
Obsessive-compulsive disorder	2.7 (\pm 0.8)	23.1	1.5 (\pm 0.6)	28.6
Posttraumatic stress disorder	0.0	—	0.0	—
Any mood disorder	4.4 (\pm 0.9)	33.3	2.3 (\pm 0.7)	36.4
Major depressive disorder	1.7 (\pm 0.6)	50.0	1.5 (\pm 0.6)	42.9
Dysthymic disorder	2.3 (\pm 0.7)	9.1	0.4 (\pm 0.3)	50.0
Manic disorder	0.2 (\pm 0.2)	0.0	0.2 (\pm 0.2)	0.0
Hypomanic disorder ^a	0.4 (\pm 0.3)	50.0	—	—
Any disruptive disorder	25.1 (\pm 1.6)	27.7	14.8 (\pm 1.2)	40.0
Any ADHD	14.8 (\pm 1.1)	30.0	6.8 (\pm 0.8)	43.8
ADHD combined	5.9 (\pm 1.1)	35.7	3.0 (\pm 0.8)	50.0
Inattentive type	7.2 (\pm 1.2)	20.6	3.2 (\pm 0.8)	33.3
Hyperactive-impulsive type	1.7 (\pm 0.6)	50.0	0.6 (\pm 0.4)	66.7
Oppositional defiant disorder	13.9 (\pm 1.6)	24.2	9.7 (\pm 1.4)	34.8
Conduct disorder	3.0 (\pm 0.8)	21.4	1.7 (\pm 0.6)	25.0

Note: ADHD = attention-deficit hyperactivity disorder.

^a There are no DISC-P impairment algorithms for hypomanic disorder.

from DISC-IV-P scores by applying algorithms provided by the authors of the DISC-IV (Shaffer et al., 2000a). It should be noted that a DISC-IV diagnosis is made when a child meets the symptom criteria of a *DSM-IV* disorder, and that this does not include significant impairment. With regard to differential diagnosis, medical and substance abuse rule-outs (e.g., hyperthyroidism, drug abuse) were not applied and mental disorder rule-outs (e.g., PDD, CD) were only applied when assessed in one of the DISC-IV modules.

Impairment due to Psychiatric Disorder. In addition to meeting *DSM-IV* symptom criteria, the impairment C algorithm of the DISC-IV (child is reported to be severely impaired in at least one area of everyday functioning in the past year) was used to assess the effect of each disorder on everyday functioning (Shaffer et al., 2000a), as it corresponds best to the criterion mentioned for most psychiatric disorders in the *DSM-IV* manual (American Psychiatric Association, 1994). This disorder-specific impairment criterion has the advantage over a global impairment measure that it is less likely to be inflated by the level of impairment due to other psychiatric disorders.

Mental Health Care Utilization. Whenever a child experienced enough key symptoms of a specific disorder, the parent was asked whether the child had received professional mental health care in the past year for these symptoms or whether an appointment was made to see a professional in the near future.

Scale of Pervasive Developmental Disorder in Mentally Retarded Persons (PDD-MRS). The PDD-MRS is a 12-item questionnaire to screen for PDD (*DSM-III-R*) in people with ID. It addresses communication, social behavior, and stereotyped behavior and has good sensitivity and specificity (Kraijer, 1997). In this study, teachers or

school psychologists completed the PDD-MRS in the first phase of the study. Children with scores of 10 or more were categorized as PDD screen positives. For 76% of the children in the second phase, a PDD-MRS score was available ($N = 360$). No significant differences (all χ^2 , $p > .05$) were found in the prevalence of *DSM-IV* disorders between children with or without a PDD-MRS score.

Socioeconomic Status. SES was assessed by evaluating both educational and occupational level of each parent and assigning a score to the highest rated parent. SES was recorded into two categories: "low SES," including the unemployed, unskilled workers and workers with lower vocational training; and "medium to high SES," including jobs requiring middle or higher vocational training or a university degree (Central Bureau of Statistics, 1993).

Educational Level. The two educational levels were used as an indication of the child's level of intellectual disability: educable (IQ 60–80) and trainable (IQ 30–60).

Data Analysis

Power analysis showed that the present sample size was large enough to detect the more common disorders (>1% prevalence) with sufficient power ($1-\beta > 0.85$) (Cohen, 1988). The relationship between diagnosis and demographic variables, and the assessment of the impact of comorbidity (absent versus present) and impairment (absent versus present) on mental health care utilization, was examined by multivariate logistic regression. When the overall model χ^2 was significant ($p < .05$), significant odds ratios (two-tailed Wald statistic, $p < .05$), adjusted for the other correlates in the model, were reported.

RESULTS

One-Year Prevalence of DSM-IV Disorders

Table 2 shows the 1-year prevalence of the *DSM-IV* disorders in children with ID. Almost 39% of the children met the symptom criteria for at least one *DSM-IV* disorder. The three most prevalent disorders were specific phobia (17.5%), ADHD (14.8%), and ODD (13.9%). None of the children met the symptom criteria for generalized anxiety disorder or posttraumatic stress disorder.

No significant sex, age, educational level, or SES differences in the prevalence of *DSM-IV* disorders were found, except for obsessive compulsive disorder (OCD; $\chi^2_4 = 12.3$, Nagelkerke $R^2 = .115$, $p < .05$). Trainable children were 3.9 times (95% confidence interval [CI] = 1.2–12.2), and 13- to 20-year-olds were 5.0 times (95% CI = 1.1–22.9) more likely to have OCD compared with educable and 7- to 12-year-olds, respectively.

Impairment in Everyday Functioning

Meeting the symptom criteria for a *DSM-IV* disorder did not always coincide with significant impairment with respect to everyday functioning. About 56% of the diagnosed children were significantly impaired in at least one area of everyday functioning (Table 2). Children with dysthymic disorder, ADHD, or specific phobia were least often impaired.

Comorbidity

Multiple disorders were observed in 14.2% of all children (36.8% of those who met *DSM-IV* symptom criteria). Of these children, 52.8% were significantly impaired in everyday functioning, which is similar to children with a single disorder. However, children with more than one *DSM-IV* disorder were 2.9 times more likely to be impaired in two or more areas of everyday functioning than children with a single disorder ($\chi^2_1 = 8.3$, $p < .01$). About half of the children with anxiety disorder (10.7% of all children) or disruptive disorder (12.6%) and four fifths of the children with mood disorder (3.6%) had a comorbid disorder.

Overall, comorbidity within the same major DISC-IV grouping of disorders (i.e., anxiety disorder, mood disorder, or disruptive disorder) was seen in 3.7% of all children (2.7% when impairment was included). Only one child (0.2%) met the criteria for both major depressive disorder and hypomanic disorder. A comorbid anxiety disorder was found in 1% (0.8% impaired) and multiple disruptive disorders in 2.5% (1.7% impaired)

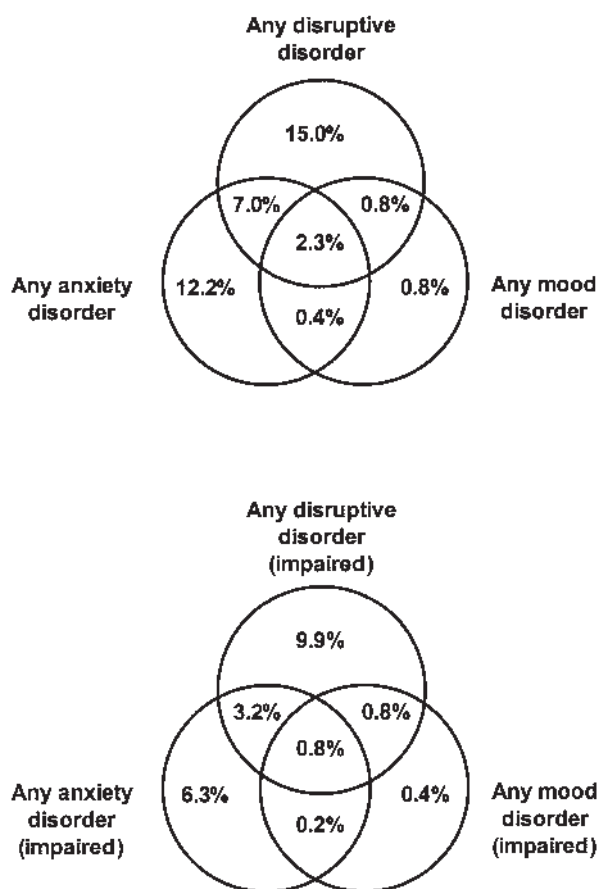


Fig. 2 Comorbidity (% prevalence) between major groupings of DSM-IV disorders with and without severe impairment in everyday functioning.

of all children. Almost 44% of the children with ADHD (any type) also met the criteria for ODD (highest within group comorbidity).

Figure 2 presents two Venn diagrams showing the overlap between the DISC-IV groupings, with and without including the impairment criterion. Comorbidity between different DISC-IV groupings of *DSM-IV* disorders was seen in 10.5% of all the children with ID (5% impaired). The largest degree of comorbidity was found for mood disorders: 79.5% of the children with a mood disorder had a coexisting disorder in another major grouping (78.3% impaired), most likely a DISC-IV disruptive disorder.

Comparing Children With or Without PDD

In this study, 7.5% ($\pm 1.4\%$) of the children were screened positive for PDD. No sex, age, or SES differences were found, only a significant educational level effect ($\chi^2_4 = 15.9$, Nagelkerke $R^2 = .105$, $p < .01$). Trainable children

were 4.7 times (95% CI = 2.1–10.6) more likely to screen positive for PDD (17.9% \pm 4.2%) than educable children (4.3% \pm 1.2%). A comorbid impairing *DSM-IV* disorder was found in 40.7% of the children screened positive for PDD. Screen positives were 3.7 times more likely (95% CI = 1.4–9.4; $p < .01$) to have an impairing anxiety disorder ($\chi^2_1 = 8.2$, $p < .01$) than screen negatives. Within the anxiety disorders, only an increased risk was found for OCD (odds ratio = 13.8; 95% CI = 2.6–71.8; $p < .001$), which in turn could be explained by an increased risk on the key symptoms: “other thoughts that kept coming back into the child’s mind over and over again that the child could not get rid of” ($\chi^2_1 = 10.3$, $p < .01$) with an odds ratio of 4.7 (95% CI = 1.7–113.0) and “any other things that the child did over and over again without being able to stop” ($\chi^2_1 = 10.3$, $p < .01$) with an odds ratio of 10.3 (95% CI = 3.8–27.9). No significant difference between children with or without PDD was found for the presence of an impairing mood or disruptive disorder, or the occurrence of 2 or more comorbid disorders (all $p > .05$).

Impact on Mental Health Care Utilization

Table 2 shows the percentage of children who received mental health care for each specific disorder. About 27% of the children who met *DSM-IV* symptom criteria received professional help. Almost 41% of those impaired received mental health care compared with 8.8% of those not impaired, and this was true for 50.7% of the children with a comorbid disorder versus 12.9% of those with a single disorder. Multivariate logistic regression analysis showed that referral to mental health care ($\chi^2_2 = 39.5$; Nagelkerke $R^2 = 0.28$, $p < .001$) was 4.2 times more likely in children with a comorbid disorder (Wald statistic [1] = 12.9, 95% CI = 1.9–9.2, $p \leq .001$), and independent of comorbidity, 3.9 times more likely in children who were impaired in everyday functioning (Wald statistic [1] = 8.2, 95% CI = 1.5–10.1, $p < .01$). PDD status did not significantly add to the prediction of referral ($p > .05$).

DISCUSSION

Most psychiatric disorders that can be identified in the general population were observed in this sample, except for generalized anxiety disorder and posttraumatic stress disorder, which are also rarely observed in general population samples of non-ID children (Costello et al., 1996b; Verhulst et al., 1997). Results showed that prevalence estimates of *DSM-IV* disorders, defined as meeting the *DSM-*

IV symptom criteria, exceeded those found in community-based case file studies of children with ID (Gillberg et al., 1986; Myers and Pueschel, 1991; Rojahn et al., 1993), and this was also true for most disorders after including the impairment criterion. This finding supports our assumption that case file studies underestimate prevalence of psychiatric disorders. Furthermore, prevalence estimates of most disorders exceeded those found in general population studies (e.g., Anderson et al., 1987; Costello et al., 1996b; Verhulst et al., 1997), which confirmed our expectations based on studies assessing behavioral problems in children with and without ID.

Demographic differences were only found for OCD, with older and trainable children being more likely to meet *DSM-IV* criteria. However, this educational level difference was related to PDD screening status and to key symptoms that included stereotypic behavior, also seen in children with PDD, suggesting overlapping symptoms or a limited ability of the DISC-IV to validly assess symptoms of OCD in the presence of PDD or ID. It should be noted, however, that neither PDD nor mental retardation is part of the *DSM-IV* exclusion criteria for OCD. The lack of age differences in the prevalence of *DSM-IV* disorders in children with ID contrasts with findings from general population studies of psychopathology (e.g., Bird et al., 1988; Cohen et al., 1993; Verhulst et al., 1997). Apart from power issues related to sample size, their younger mental age might to some extent explain the lack of (chronological) age differences. For example, problem behaviors that are often found to be less prevalent at older age in non-ID samples, such as ADHD and ODD, are far more prevalent in children with ID of all ages. In these children, the development of behavioral regulation might mature at a slower pace. In addition, possible causes of impulsive behavior and attention problems in children with ID are perhaps more likely to be based in the more common neurological and genetic deficits (Bregman, 1991), which are less likely to change over time.

We found that more than half of the children with ID are impaired in everyday functioning by their symptoms compared with one third to one half of the non-ID children (Bird et al., 1988; Costello et al., 1996a; Verhulst et al., 1997), suggesting that psychopathology is more likely to cause impairment in everyday life in children with ID than in non-ID children.

Although it was shown that the majority of children with specific phobia had neither severe signs of impairment nor a comorbid anxiety disorder, still a relatively

high percentage of children met *DSM-IV* criteria compared with prevalence estimates from non-ID studies (e.g., Anderson et al., 1987, Bird et al., 1988). A less developed reality testing and lower self-confidence in children with ID might make it harder for them to cope with frightening situations.

The majority of the children had a single *DSM-IV* disorder. However, 37% had a comorbid disorder, which is within the range of comorbidity found in general population studies of non-ID children (e.g., Anderson et al., 1987; Cohen et al., 1993). Children with more than one *DSM-IV* disorder were more likely to experience significant impairment in different areas of everyday functioning, suggesting more pervasive impairment, compared with children with a single disorder.

Comorbidity within a major grouping of disorders was highest between ADHD and ODD. Comorbidity between major groupings of disorders was most common between disruptive disorder and mood disorder, followed by disruptive disorder with anxiety disorder. In contrast to general population findings, the strongest associations were not found between CD and ADHD or between mood disorder and anxiety disorder (Angold et al., 1999). The first difference might be explained by the observation that ODD is often seen as a developmental precursor of CD (Angold et al., 1999). Because children with ID have significant developmental delays and because they are perhaps less able to act upon antisocial tendencies because of closer supervision, they might make the transition from ODD to CD at a later age or they might be less likely to make the transition at all. The difference in comorbidity between major *DSM-IV* grouping might also be explained by their younger mental age (e.g., irritable mood instead of depressed mood, because of limitations in the expression of feelings). Future longitudinal studies should focus on disentangling questions related to timing of disorder onset and development of comorbidity in relation to both chronological age and mental age. Information is needed on developmental tracks of psychopathology in children with ID, the effects of major life transitions, and associated risk and protective factors.

This study also assessed the effect of diagnosis, comorbidity, and impairment on receiving mental health care. Less than one third of the children who met the symptom criteria for a *DSM-IV* disorder received mental health care, which is similar to rates in non-ID children (Anderson et al., 1987; Koot and Verhulst, 1992; Offord et al., 1987). Although the most vulnerable children (those

with multiple or impairing disorders) were most likely to receive mental health care, still about one half of these children were not served. Only a moderate strength of association was found between service utilization and comorbidity and impairment factors, suggesting the importance of other factors related to mental health care utilization. These might include the recognition of a problem by the parent(s), knowledge of the availability and accessibility of professional care, the availability of alternative resources of support, expectations about effectiveness of mental health services available, parental psychopathology, family composition, family functioning, and life stresses (Borthwick-Duffy, 1994; Offord et al., 1987; Verhulst and van der Ende, 1997).

Clinical Implications

The results from this study make us aware that most studied disorders can be observed in children with borderline to moderate ID, that procedures for identifying these disorders are available and can be used in this population, and that most estimates of prevalence of *DSM-IV* disorders exceed those found in non-ID children. Although many children with ID who meet the symptom criteria for a *DSM-IV* disorder seem to function rather well, still about half of them are severely impaired in everyday functioning. These children might require special attention, especially when knowing that less than half of these children actually received mental health care in the past year. Just as in non-ID children, the presence of a comorbid disorder and severe impairment in everyday functioning in children with ID are important indicators of need for mental health care in this special population.

Methodological Limitations

The study captured a large sample of children with ID living at home and attending a school for the ID. Because few children with mild to moderate ID visit a regular or another type of school in the Netherlands (<0.1%), this sample is thought to be representative of the large majority of students with borderline to moderate ID. Children from low SES families were somewhat underrepresented, although half of the children came from families with low SES.

It is generally assumed that people with ID, and especially those with borderline to moderate levels of ID, present the full range of psychiatric disorders in roughly the same manner as non-ID people (Borthwick-Duffy, 1994; Sturmey, 1993, 1995), which is supported by findings

that indicate a considerable overlap between psychopathology assessed with instruments developed for the general population and instruments developed specifically for the ID population (Dekker et al., 2002b). However, the applicability of a classification system like the *DSM* (American Psychiatric Association, 1994) to this population is still somewhat questionable (Einfeld and Tonge, 1999). Some have modified the existing criteria for diagnosing people with ID (Deb et al., 2001). At the same time, we agree with Sturmey (1995) when he emphasizes the importance of initially using these classification systems in an unmodified way, because to date many modifications are still quite ad hoc, not always clearly operationalized, and make it harder to compare across studies. Nevertheless, we acknowledge that a greater degree of inference on the part of the parent may be needed as symptoms and signs of psychiatric disorders are more likely to be expressed in a somewhat altered fashion.

Not applying medical or substance abuse rule-outs and mental disorder rule-outs only when assessed in the DISC-interview might have caused an overestimation of the true prevalence of specific psychiatric disorders. However, the conceptual and empirical bases for these decision rules are not explicit (Sturmey, 1995) and more research is needed on the effect of including and excluding these rule-outs.

Unfortunately, no child, teacher, or clinician information on *DSM-IV* disorders was available to provide a broader perspective and to allow for interinformant comparisons. Because we used a PDD screen, no PDD diagnoses were available.

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