Eur Child Adolesc Psychiatry (2004)
13:347–353 DOI 10.1007/s00787-004-0367-1

ORIGINAL CONTRIBUTION

Paul McArdle
Jonathan Prosser
Izzy Kolvin

Prevalence of psychiatric disorder: with and without psychosocial impairment

Accepted: 19 August 2003

Dr. P. McArdle (✉) · J. Prosser · I. Kolvin†
Fleming Nuffield Unit
Tyne House
Northern Counties School for the Deaf
Tankerville Terrace, Jesmond
Newcastle-upon-Tyne NE2 3BB, UK

Abstract *Objective* To identify rates of psychiatric disorder in a representative sample of primary school children in a North of England city. *Method* The study obtained multi-criterion screen data on a representative one-in-three sample of 7- and 8-year-old children in Newcastle upon Tyne. It also obtained psychiatric interview data for screen-positive and a proportion of screen negative children. In addition the clinically trained interviewers rated psychiatric impairment. *Results* Estimated rates of disorder with impairment, calibrated to be equivalent to that of children attending local child psychiatric clinics, were 1.2% for emotional disorder, 5.6% for disruptive behaviour disorder and 6.7% for any disorder. *Conclusion* These findings are consistent with other contemporary studies using similar impairment criteria.

Key words epidemiology – prevalence – psychiatric disorder – children

Introduction

The study of child psychiatric epidemiology, 'the determination of the rates and distribution of childhood mental disorders' [7], is important in understanding the correlates and origin of child mental disorders [14, 33] and their evolution over relatively short [15] or longer periods [28]. Epidemiological data also contribute by 'informing public policy regarding the design and funding of psychiatric services' [14, 30], especially important for a section of the population that cannot articulate its own needs.

The ground-breaking Isle of Wight [32, 33] provided important early data concerning the rates, nature, aetiology of and urban-rural differences in child mental disorder. Also, the development of two-stage methodology, with an initial screen and interviews of samples of screen positive and negative in a second phase, provided a model for other European [15, 17, 37] and important American [5, 9, 12, 34] studies.

The screens used in two stage designs vary; brief telephone parent interviews focussing on 'externalising' symptoms [5, 12], or parent, child or teacher questionnaires [37]. However, since teachers and parents identify different problems and individuals as at risk [36] and particularly since teacher data may have greater predictive validity [18], it may be important to include data derived from teachers to identify all the 'cases' in a population.

More recently, Meltzer et al. [27] reported interview-based data from a one-stage household study of a large national sample. Although there are major advantages to this method, for instance, full data were available on all participants, including those not attending school, it is very demanding of interview time. Also, reliance on an interview schedule developed specifically for the project and the absence of explicit impairment criteria present difficulties in making comparisons with other studies.

Measurement of functional impairment in addition to symptoms is a feature of studies conducted in the last decade [35]. This has contributed to estimations of the prevalence of true disorder, of a severity, for instance, similar to that presenting to clinical services; to validity

European Child & Adolescent Psychiatry (2004) Vol. 13, No. 6

and to estimations of need in a community. However, how to measure impairment remains uncertain: for instance, by measures embedded in the diagnostic interview and linked to individual symptoms [6], by case vignettes [27] or by global rating [35].

Symptom-related measures have the advantage of identifying the contribution of particular symptoms and diagnoses to global impairment. However, in the absence of clinical judgement there are problems calibrating such systems [10]. Also, global ratings are more time efficient and, when conducted by clinicians, can explicitly link impairment to clinical judgement [28]. Furthermore, global measures may be good predictors of service utilisation and need [11]. They do not specify which symptoms and, in the presence of comorbidity, which diagnoses have caused impairment. Nevertheless, faced with complex clinical presentations, this is a not unusual experience in clinical practice, certainly after one interview.

The current study utilises a school-based screen, a recognised semi-structured interview and a measure of global impairment rated by clinically trained interviewers to ascertain rates of a core of clinically significant disorders in an urban community.

Aims and hypotheses

The aims of the present study are to describe the prevalence of child mental disorders.

Method

Population

The study was conducted in the city of Newcastle-upon-Tyne, a university, administrative and industrial city in the north-east of England. As elsewhere in the UK, traditional heavy industry has been replaced in part by service and light engineering and other manufacturing industries. Due to the long-term decline of local heavy industry and the geographical isolation of the city there has been only very limited minority ethnic migration (3 % of the city population) mainly from the Indian subcontinent.

In the census immediately preceding the study (Newcastle-upon-Tyne city council 1993), which coincided with an economic recession, the unemployment rate (15.3 %) had been slightly higher than in other Northern industrial cities (12.3 %). The population of the city is approximately 280,000 with 60,000 children and young people of 16 years and under.

Sample

In association with the Newcastle-upon-Tyne Local Education Authority, a representative sample of 7- and 8-year-old children was obtained by selecting all children attending one-in-three randomly selected primary schools in the city in 1993/94. The sampling frame included voluntary (religious) schools as well as state schools and children registered as having learning or behaviour problems in mainstream classes. The four private primary schools were omitted, as they included many children drawn from outside Newcastle (approximately half their intake). This resulted in a sample of 1051 7- and 8-year-olds drawn from 26 schools.

Multicriterion screen

The sample of 7- and 8-year-olds was screened using a multicriterion screen previously applied in Newcastle-upon-Tyne [19–21]. This included the Rutter (B) teacher scale [31] and sociometric indices [21] and the Young Group Reading Test [38]. Children were identified as at-risk by one or more of five criteria: i) a cut-off score of 10 on the Rutter B; ii) absenteeism: a rating of 'certainly applies' to item N on the Rutter B scale, 'tends to be absent from school for trivial reasons'; iii) a reading quotient of 75 or less on the Young Group Reading Test; iv) isolation, defined as the absence of positive choices by peers (no or one positive choice); and v) rejection, defined as the presence of a large number of negative choices (fourteen or more in a class of 30). Either isolation or rejection was ascertained followed an exercise in which each child was asked to choose three classmates they would like to sit beside or play with.

This screen was chosen for two reasons: as the first stage in a two stage epidemiological study but also to generate data comparable to an earlier data base for the purpose of comparison. For this reason we used it unchanged. Teachers were paid a fee for completing questionnaires and supervising the sociometric exercise. They also completed the Teacher Report Form [1]. Full data were available on 1044 children, 99.3 % of the sample.

Diagnostic interview

Interviews were conducted by a research psychiatrist with experience in child and adolescent psychiatry and a senior research assistant (a teacher with extensive day- and in-patient experience in child and adolescent psychiatry) using the Child and Adolescent Psychiatric Assessment [4, 6]. This is an interviewer-based, structured assessment that enables interviewers to code the presence or absence, duration, frequency and onset of symp-

toms. It also allows a rating of severity and both parent and child versions are available. Because of the young age of our sample, only the parent version was used in this study. Also, because of resource constraints, we modified the interview in two ways: assessment was limited to symptoms of more common diagnoses in the realm of behavioural and emotional disorders. These included attention-deficit/hyperactivity disorder (ADHD), conduct disorder (CD), opposition defiant disorder (ODD), major depressive disorder (MDD) separation anxiety disorder (SAD), and overanxious disorder (OAD). We did not include less common problems such as autistic disorder, somatisation disorders, tics, or trichotillomania. We also did not count elimination disorders in our core of psychiatric problems. In the case of diagnostic uncertainty, diagnosis was assigned following discussion between the interviewers and/or with the project supervisor (PMcA).

At the time of the study, DSM IV [3] had not been published and we relied on DSM-III-R [2] diagnostic algorithms. None of the disorders has changed in fundamental principale between the two schedules so that comparisons between the two diagnostic systems are possible. However, there were some differences with regard to ADHD. These included some differences in symptoms and especially more stringent requirements for 'clinically significant' impairment of functioning. Also, the DSM-III-R system did not allow discrimination between predominantly inattentive, hyperactive-impulsive or combined types.

Thirdly, we did not use the CAPA to rate severity of psychopathology. Severity of psychosocial impairment was rated using the Children's Global Assessment Scale [8, 35]. This rates severity of impairment according to clinical operational criteria, on a scale of 1–100. A lower score indicates greater impairment. In a separate exercise, the mean difference in CGAS scores rated by two child and adolescent psychiatrists, using written abstracts of case files and calculated for 18 cases, was 3.4 (95% C.I. = -3.3–10.1). Also, the mean CGAS for children referred and seen as outpatients was 55 [24]. This was completed by interviewers after the parent interview. The CGAS provides a somewhat more conservative estimate of rates of psychosocial impairment than the CAPA [10, 11].

Interviews were completed on an approximately two-in-three random sample of parents (usually mothers) of screen-positive children, and a one-in-eight sample of screen-negatives. Following initial analysis assignment to screen positive or negative status, families were identified for interview by a secretary so interviewers were blind to the screen status of subjects. If parents were unavailable for interview despite a number of attempts to achieve contact, the interview was conducted with the next appropriate (screen positive or screen negative) family on the list. This resulted in parent interviews for 93 screen-negative and 184 screen-positive children. CGAS data were missing on one screen positive child. There were no differences on any of the screen measures between screen positive participants who were interviewed and those who were not. This was true also of screen negative participants interviewed and not.

Prevalence: estimates back to the original population

As information was available about the proportion of the original population that proved to be screen negative and screen positive, it was possible to estimate the prevalence rates of syndromes and disorders. This was calculated at levels:

(A) of a syndrome, i.e. those who satisfied the criteria for a DSM-III-R diagnosis, irrespective of the presence of associated psychosocial impairment and, (B) disorder, diagnosis and psychosocial impairment (CGAS < 71) and diagnosis with moderate psychosocial impairment (CGAS < 61). These ratings cut-points were used for the purpose of comparison with other studies and because the more stringent impairment criterion (CGAS < 61) approximated to the mean level of outpatients, seen in our clinics, but significantly higher than the mean impairment level of day- and in-patients [11], the term 'moderate impairment' was judged appropriate for CGAS < 61 [34]. It was also possible to estimate numbers of children with (C) pervasive ADHD, i.e. with ADHD syndrome, psychosocial impairment and displaying classroom hyperactivity according to the Teacher Report Form (t-score greater than 60 on the 'attention problems' subscale) or Rutter questionnaires. Estimates of prevalence were based on the formula [16, 21]: prevalence = [(proportion screen +ve with diagnosis × proportion screen +ve in total sample) + (proportion screen –ve with diagnosis × proportion screen –ve in total sample)] × 100/(total number in whole sample).

Standard deviations for prevalence took account of the unequal sampling probabilities of the screen-negative and screen-positive subjects according to a standard formula, which is available on request.

Findings

Efficiency of the screen

The screen was moderately sensitive, identifying 76.9% of cases. However, specificity was low (Table 1). Nevertheless, the specificity of the original screen is similar to that reported elsewhere [16]. The addition of a parent questionnaire to the screen would have probably improved the screen's characteristics, but would have resulted in a much lower rate of completed data [16].

European Child & Adolescent Psychiatry (2004) Vol. 13, No. 6

Table 1 Efficiency of the screen and caseness determination

Screen criteria	Syndrome		Syndrome and CGAS < 71		Syndrome and CGAS < 61		
	Case	Non-case	Case	Non-cases	Case	Non-cases	Total
All criteria							
Screen –ve	16	78	9	85	4	90	94
Specificity %		(35.8)		(36.7)		(36.0)	
Screen +ve	43	140	30	153	23	160	
Sensitivity %	(72.9)		(76.9)		(85.2)		183**
Two criteria:*							
Screen –ve	28	140	15	153	8	160	168
Specificity %		(64.2)		(64.3)		(64.0)	
Screen +ve	31	78	24	85	19	90	109
Sensitivity %	(52.5)		(61.5)		(70.4)		
Total	59	218	39	238	27	250	

* Rutter score > 10 and sociometric rejection; ** CGAS data were missing for one case

Prevalence of disorder

Among disruptive behaviour disorders, ADHD proved the most common disorder at this age (Table 2). In addition, striking changes in gender ratio occurred as severity of disturbance increased: virtually all the children with moderate impairment and all with pervasive ADHD were male. CD was the least common of the disruptive behaviour disorders at this age (Table 2). Also, the prevalence did not change substantially with different levels of impairment. Impairment was also reflected in degrees of comorbidity: 27% of those with ADHD and impairment, 43% of those with ADHD and moderate impairment and 53.3% of those with pervasive ADHD also displayed either CD or ODD. No children with ODD or CD alone had pervasive symptoms; among the disruptive behaviour disorders, pervasiveness was a marker for ADHD. Overall, 10.5% and 5.6% of the children in this population showed a disruptive behaviour disorder with, respectively, impairment and moderate impairment. Only 1.4% of the sample had a pervasive disruptive behaviour disorder all of which had ADHD.

Table 2 The prevalence of disruptive behaviour disorders at four levels of caseness

	Syndrome	With CGAS < 71	With CGAS < 61	Pervasive disorder*
ADHD				
n (%)	116 (11.1)	70 (6.7)	44 (4.2)	15 (1.4)
95% CI	8.9–13.3	4.9–8.2	2.8–5.6	0.7–2.0
ratio m:f	1.4:1	2.7:1	13.7:1	all male
ODD				
n (%)	68 (6.6)	52 (5.0)	29 (2.8)	–
95% CI	5.0–8.2	3.4–6.6	1.6–4.0	
ratio m:f	1:1.3	1.3:1	1.6:1	
CD				
n (%)	21 (2.0)	18 (1.7)	16 (1.5)	
95% CI	1.8–3.8	0.7–2.7	0.6–2.6	–
ratio m:f	0.9:1	1.2:1	1:1	
ADHD and CD**				
n (%)	3 (0.3)*	3 (0.3)*	3 (0.3)*	
95% CI	–1.1–1.8	–1.1–1.8	–1.1–1.8	–
ratio m:f	all male	all male	all male	
ADHD and ODD**				
n (%)	24 (2.3)	16 (1.6)	16 (1.6)	8 (0.8)
95% CI	1.3–3.3	0.7–2.6	0.7–2.6	1.2–2.2
ratio m:f	2.5:1	1.1:1	1.1:1	all male
Any disruptive behaviour				
n (%)	166 (15.9)	109 (10.5)	59 (5.6)	15 (1.4)
95% CI	13.3–18.5	8.5–12.5	3.8–7.4	0.7–2.0
ratio m:f	1.1:1	1.7:1	4.1:1	all male

* CGAS < 61 and 'externalising' behaviour according to TRF or teacher Rutter questionnaire; ** small numbers

Separation anxiety disorder was the most common emotional disorder followed by overanxious disorder, while major depressive disorder was rare. However, MDD showed a strong association with impairment and this was weaker in relation to OAD or SAD. Interestingly, boys predominated among those with emotional disorders.

Finally, the total rate of mental disorder in the population was 10.7% with impairment and 6.7% with moderate impairment.

Discussion

This study was undertaken in order to provide a current estimate of rates of mental disorder among urban children, calibrating case ascertainment by clinical judgement, and to compare rates of disorder across studies conducted in the past decade. Its strengths include virtually complete teacher and child data, diagnostic interviewing by clinicians and at least some data from parent, teacher and children.

In the Great Smoky Mountains study (GSMS) of rural and small town North Carolina, Costello et al. [11] estimated a rate of 6.8% for combined DSM-III-R disruptive behaviour disorders. This was based upon both diagnosis and impairment criteria (CGAS < 71 *or* impairment according to a further two scales). However, since the total rate of what the authors termed 'severe... disturbance' (i.e. CGAS < 61) in that study was only 1.8% [11], the rate of 'severe' disruptive behaviour disorder (with CGAS < 61) is likely to have been less than 1%. This is a rather low figure, but for a rural population [29] is not out of keeping with rates calculated elsewhere using the same CGAS criterion. These include 2.8% for all disruptive behaviour disorders in the mixed urban-rural Chartres population [16]; 3.7% in the multi-site, mixed urban and rural US-based NIMH study [34] and 3.4% in the Netherlands [37].

Prevalence data concerning mutually exclusive categories of disorder were not presented in the Puerto Rico study of Bird et al. [9] so that comparison is more difficult. Nevertheless, using the available data it is possible to estimate that the rate of disruptive behaviour disorder with impairment in that population was over 10%. This high rate was attributed to the prevalence of risk factors such as poverty, unemployment, violent crime and alcohol consumption. The corresponding rate for urban Newcastle of 5.6% (with CGAS < 61) is lower than Puerto Rico but somewhat higher than rates in other developed regions. As developmental disorders, including ADHD tend to decline through childhood [5], this finding could be related to the young age of our population. Nevertheless, the Meltzer et al. [27] study calculated a rate of 6.1% for disruptive behaviour disorder, similar to the rate calculated here. Also, the rate of pervasive ADHD reported here is similar to rates of hyperkinetic disorder in UK samples of similar age [22, 36] and for combined type ADHD [5] estimated among US children and adolescents. These findings do suggest a relatively high rate of disruptive behaviour in the UK and are consistent with, for instance, the high rates of reported substance misuse among UK youth [25, 26].

Other findings have demonstrated that severe disruptive behaviour disorders in childhood are uncommon in the absence of at least some symptoms of ADHD [22, 23]. These data refine that observation. It may be not just the severity of disturbed behaviour but its pervasiveness that points to ADHD. Hence, in a complex presentation this criterion should aid clinical decision-making: pervasive symptoms of behaviour disturbance suggest the presence of ADHD.

The estimated rates for emotional disorder, based on the presence of impairment, follow a broadly similar pattern. Rates were low in the GSMS of North Carolina, < 1% [11]; intermediate in Newcastle, 2.7%, Chartres, 3.1% [16] and highest in Puerto Rico, i.e. 5.9% [9]. They were also high in the Netherlands (6.3%) but the latter study included adolescents as well as children [37]. Once again, despite dissimilarities in methodology, the rate in Newcastle and that in the Meltzer et al. [27] study (3.3%) were similar. These rates are lower than the most recent estimates of Angold et al. [5]. However, in the latter study, global ratings of impairment were not used, risking over-estimates especially of anxiety disorders [11].

Hence, the overall rates of disorder, calculated using the CGAS < 61 impairment criterion combined with diagnosis appear lowest in the GSMS (1.8%). They were intermediate in Chartres (5.9%), the NIMH study (6%), Newcastle (6.7%), the Netherlands (7.9% – including adolescents), and highest in Puerto Rico (12%). These rates, reliant on global measures of impairment, are lower than rates calculated using symptom-related impairment [5, 12] but are consistent with the rates of disorder calculated using the clinical vignette approach, both using clinical judgement as a criterion of diagnosis. We argue that they approximate true rates of a core of disorders in the community.

Methodological issues

While the screen was sensitive, it lacked specificity. Had both the screen and the diagnostic interview been conducted respectively in school and with teachers, or had the screen included parent derived information (i.e. screens and diagnostic assessments using the same

Table 3 The prevalence of emotional disorders at different levels of caseness

	Syndrome	With CGAS < 71	With CGAS < 61
Separation anxiety disorder			
n (%)	36 (3.1)	21 (2.0)	10 (0.9)
95% CI	1.8–4.4	0.9–3.1	–1.7–3.5
ratio m:f	4:1	6:1	all boys
Over anxious disorder			
n (%)	16 (1.6)	5 (0.5)	5 (0.5)
95% CI	0.7–2.5	–1.3–2.3	–1.3–2.3
ratio m:f	4:1	3:2	3:2
Major depressive disorder			
n (%)	5 (0.5)	3 (0.3)	3(0.3)
95% CI	0.3–0.7	–1.2–1.8	–1.2–1.8
ratio m:f	1:2*	1:1*	1:1*
Any emotional disorder			
n (%)	47 (4.5)	24 (2.3)	13 (1.2)
95% CI	3.0–6.0	1.2–3.4	–1.7–4.1
ratio m:f	4:1	3:1	3:1
Any disorder			
n (%)	200 (19.2)	122 (11.7)	70 (6.7)
95% CI	16.4–22.0	9.4–14.0	4.9–8.5
ratio m:f	1.3:1	1.7:1	3.7:1

* small numbers

European Child & Adolescent Psychiatry (2004) Vol. 13, No. 6

sources at both stages of assessment) it is likely that the specificity would have increased. Screens that include both parent and teacher data are desirable but it is difficult to obtain complete parent data [37]. In the current study we obtained, uniquely in current screens, child as well as teacher data; it was beyond our resources to gather adequate parent data at a screen stage. Nevertheless, since child measures themselves have predictive validity [13], and teacher data greater predictive validity than parent data [18], we believe the calculations of prevalence reflect valid estimations of the overall rates of disorder. Indeed, the consistencies across studies are such that the type of screen used may not make a crucial difference to final estimations of prevalence.

The absence of child interview data is likely to impact mainly on rates of emotional disorder, possibly less relevant to the child population studied here than adolescent populations [5]. Although we did include child data, items reflecting emotional disturbance were not explicitly present in the screen. Hence, it is possible that the rate, particularly of major depression reported here, is an underestimate.

In addition, the study sample was drawn from 7–8-year-olds potentially restricting the degree to which findings can be generalised to other age groups. Rates of disorder do appear to decline somewhat during childhood [5] raising the possibility that rates calculated for 7–8-year-olds could be somewhat higher than in later childhood before rising again in adolescence [5]. However, comparisons with other studies do not suggest that this is a major issue.

Finally the data were gathered almost a decade ago. However, the study was broadly contemporaneous with a number of others facilitating national and international comparisons of rates of disorder particularly in the 1990s. Hence, international comparisons are not confounded by potential period effects.

Conclusions

This study is one of relatively few European epidemiological studies of childhood mental disorder. It makes use of an indicator of psychosocial impairment previously validated by the same team against clinically referred cases. The overall rate of mental disorder of approximately 6.7% is similar to other studies using the same criterion. We believe that this measure is close to a valid estimate of rates of a core of mental disorders in the child population.

References

1. Achenbach T (1991) Manual for the Teacher Report Form and 1991 Profile. Burlington VT: University of Vermont Department of Psychiatry
2. American Psychiatric Association (1987) Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised, Washington DC
3. American Psychiatric Association (1994) Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Washington DC
4. Angold A, Costello E (1995) A test-retest reliability study of child-reported psychiatric symptoms and diagnoses using the Child and Adolescent Psychiatric Assessment (CAPA-C). Psychol Med 25:755–762
5. Angold A, Erkanli A, Farmer E, Fairbank J, Burns B, Keeler G, Costello E (2002) Psychiatric disorder, impairment, and service use in rural African American and white youth. Arch Gen Psychiatry 59(10):893–901
6. Angold A, Prendergast M, Cox A, Harrington R, Simonoff E, Rutter M (1995) The Child and Adolescent Psychiatric Assessment (CAPA). Psychol Med 25: 739–753
7. Bird H (1996) Epidemiology of childhood disorders in a cross-cultural context. J Child Psychol Psychiatry 37(1): 35–50
8. Bird H, Canino G, Rubio-Stipec M, Ribera J (1987) Further measures of the psychometric properties of the Children's Global Assessment Scale. Arch Gen Psychiatry 44:821–824
9. Bird H, Canino G, Rubio-Stipec M, Gould M, Ribera J, Sesman M, Woodbury M, Huertas S, Pagan A, Sanchez-Lacay A, Moscoso M (1988) Estimates of the prevalence of childhood maladjustment in a community survey in Puerto Rico. Arch Gen Psychiatry 45: 1120–1126
10. Bird H, Davies M, Fisher P, Narrow W, Jensen P, Hoven C, Cohen P, Dulcan M (2000) How specific is specific impairment? J Am Acad Child & Adoles Psychiatry 39(9):1182–1189
11. Costello E, Angold A, Burns B, Erkanli A, Stangl D, Tweed D (1996) The Great Smoky Mountains Study of Youth: functional impairment and serious emotional disturbance. Arch Gen Psychiatry 53:1137–1143
12. Costello E, Angold A, Burns B, Stangl D, Tweed D, Erkanli A, Worthman C (1996) The Great Smoky Mountains Study of Youth: goals, design, methods and the prevalence of DSM-III-R disorders. Arch Gen Psychiatry 53:1129–1136
13. Costello E, Angold A, Keeler G (1999) Adolescent outcomes of childhood disorders: the consequences of severity and impairment. J Am Acad Child & Adoles Psychiatry 38(2):121–128
14. Dulcan M (1996) Introduction: epidemiology of child and adolescent mental disorders. J Am Acad Child Adoles Psychiatry 35(7):852–854
15. Esser G, Schmidt M, Woerner W (1990) Epidemiology and course of psychiatric disorders in school-age children – results of a longitudinal study. J Child Psychol and Psychiatry 31(2):243–263
16. Fombonne E (1994) The Chartres study: I. Prevalence of psychiatric disorder among French school-age children. Br J Psychiatry 164:69–79
17. Jeffers A, Fitzgerald M (1991) Irish Families Under Stress, Volume 2. Dublin: Eastern Health Board
18. Jensen P (2000) Commentary. J Am Acad Child Adoles Psychiatry 39: 984–987
19. Kolvin I, Garside R, Nicol A, Leitch I, Macmillan A (1977) Screening school children for high risk of emotional and educational disorder. Br J Psychiatry 131:192–206

20. Kolvin I, Garside R, Nicol A, Macmillan A, Wolstenholme F, Leitch I (1981). Help Starts Here: The Maladjusted Child in the Ordinary School. London, Tavistock Publications
21. Macmillan A, Kolvin I, Garside R, Nicol A, Leitch I (1980) A multiple criterion screen for identifying school children with psychiatric disorder. Psychol Med 10:265–276
22. McArdle P, O'Brien G, Kolvin I (1995) Hyperactivity: prevalence and relationship with conduct disorder. J Child Psychol Psychiatry 36(2):279–305
23. McArdle P, OBrien G, Kolvin I (2002) Hyperactivity and conduct disorder: background factors. Ir J Psychol Med 19(2):42–47
24. McArdle P, Gillett T (1997) Psychiatric in-patient treatment for children and adolescents in the UK: criteria for admission. Isr J Psychiatry & Related Sci 34(3):195–199
25. McArdle P, Wiegersma A, Gilvarry E, McCarthy S, Blom M, Fitzgerald M, Brinkley A, Kolte B, Quensel S (2002) Family structure and function and youth drug use. Addiction 97:329–336
26. McArdle P, Wiegersma A, Gilvarry E, McCarthy S, Blom M, Fitzgerald M, Brinkley A, Kolte B, Quensel S (2000) International variations in drug use. Europ Add Res 6(4):163–169
27. Meltzer H, Gatward R, Goodman R, Fort T (2000) The Mental Health of Children and Adolescents in Great Britain. London: Stationary Office
28. Prosser J, McArdle P (1996) The changing mental health of children and adolescents: evidence for a deterioration? Psychol Med 26:715–725
29. Quinton D (1988) Urbanism and child mental health. J Child Psychol Psychiatry 29:11–20
30. Roberts R, Attkisson C, Rosenblatt A (1998) Prevalence of psychopathology among children and adolescents. Am J Psychiatry 155(6):715–725
31. Rutter M (1967) A children's behaviour questionnaire for completion by teachers: preliminary findings. J Child Psychol Psychiatry 8:1–11
32. Rutter M (1989) Isle of Wight revisited: 25 years of child psychiatric epidemiology. J Am Acad Child Adoles Psychiatry 28(5):633–653
33. Rutter M, Tizard J, Whitmore K (1970) Education, Health and Behaviour. London: Longmans
34. Shaffer D, Fisher P, Dulcan M, Davies M, Piacentini J, Schwab-Stone M, Lahey B, Bourdon K, Jensen P, Bird H, Canino G, Regier D (1996) The NIMH Diagnostic Interview Schedule for Children Version 2.3 (DISC 2.3): description, acceptability, prevalence rates, and performance in the MECA study. J Am Acad Child Adoles Psychiatry 35(7):865–877
35. Shaffer D, Gould M, Brasic J (1983) A children's global assessment scale (CGAS). Arch Gen Psychiatry 40: 1228–1231
36. Taylor E, Sandberg S, Thorley G, Giles S (1991) The epidemiology of childhood hyperactivity. Maudsley Monographs number 33. Oxford University Press
37. Verhulst F, van der Ende J, Ferdinand R, Kasius M (1997) The prevalence of DSM-III-R diagnoses in a national sample of Dutch Adolescents. Arch Gen Psychiatry 54:329–336
38. Young D (1968) Manual for the Group Reading Test. London: University of London Press