

Psychological Problems in Children with Bedwetting and Combined (day and night) Wetting: A UK Population-Based Study

Carol Joinson,¹ PhD, Jon Heron,¹ PhD, Alan Emond,² MD, FRCP, FRCPC, and Richard Butler,³ PhD
C.Psychol

¹Department of Social Medicine, University of Bristol, ²Department of Community Based Medicine, University of Bristol, and ³Clinical Psychology Department, Child & Adolescent Mental Health Services, East Leeds Primary Care Trust, UK

Objective To investigate the psychological problems associated with bedwetting and combined (day and night) wetting in children aged around 7½ years. **Methods** Participants were a cohort of over 8000 children enrolled in the population-based Avon Longitudinal Study of Parents and Children. Parents completed postal questionnaires assessing common childhood psychological problems, and children were asked about behavior, friendships, bullying, and self-esteem in clinical interviews. The rates of psychological problems were compared in children with bedwetting, combined wetting, and in children with no wetting problems. **Results** The study found a higher rate of parent-reported psychological problems in children with bedwetting and combined wetting compared with those with no wetting problems. Children with combined wetting were particularly at risk for externalizing problems. There was little difference with the child-reported measures. **Conclusions** Bedwetting and combined wetting are associated with parent-reported psychological problems and combined wetting confers an increased risk for externalizing problems.

Key words bedwetting; behavior; daytime wetting; enuresis; psychological problems.

Bedwetting is a prevalent and potentially distressing experience for children and their parents (Butler, 1994; 1998). Around 15–22% of boys and 7–15% of girls wet the bed at 7 years of age, with almost 3% wetting more than twice a week (Butler, Golding, & Northstone, 2005). Combined (day and night) wetting has been reported in 3.3% of 7-year-olds (Butler et al., 2005) and 4% of children aged 5–12 years (Bower, Moore, Shepherd, & Adams, 1996). The Diagnostic and Statistical Manual for Mental Disorders (DSM-IV: American Psychiatric Association, 1995) uses the term enuresis for the repeated voiding of urine into clothing, occurring at least twice a week, for at least three consecutive months, in children over 5 years of age in the absence of congenital or acquired defects of the central nervous system.

There is a growing literature investigating whether children who wet the bed experience more psychological distress compared with children who are dry at night.

Some studies find no increased rates of psychological problems in children who wet the bed (Hirasing, van Leerdam, Bolk-Bennink, & Bosch, 1997; Robinson, Butler, Holland, & Doherty-Williams, 2003; Wagner & Geffken, 1986; Wille & Anvenden 1995), or when higher behavior problem scores are found in children with bedwetting, they are still within normal limits and therefore of limited clinical significance (Couchells, Johnson, Carter, & Walker, 1981; Friman, Handwerk, Swearer, McGinnis, & Warzak, 1998). In another study, the association between bedwetting and psychological problems disappeared after adjusting for socioeconomic status (Van Hoecke, Baeyens, Vande Walle, Hoebek, & Roeyers, 2003). However, an increasing number of studies are finding evidence for increased levels of psychological problems in children who wet the bed compared with those who do not wet the bed, with more internalizing and externalizing problems (Byrd, Weitzman, Lanphear, & Auinger, 1996; Chang, Ng, & Wong, 2002;

All Correspondence concerning this article should be addressed to Carol Joinson PhD, Avon Longitudinal Study of Parents and Children, Department of Social Medicine, 24 Tyndall Avenue, Bristol, BS8 1TQ, UK. E-mail: Carol.Joinson@bristol.ac.uk

Journal of Pediatric Psychology 32(5) pp. 605–616, 2007

doi:10.1093/jpepsy/jsl039

Advance Access publication October 27, 2006

Journal of Pediatric Psychology vol. 32 no. 5 © The Author 2006. Published by Oxford University Press on behalf of the Society of Pediatric Psychology. All rights reserved. For permissions, please e-mail: journals.permissions@oxfordjournals.org

Feehan, McGee, Stanton, & Silva, 1990; Fergusson & Horwood 1994; Liu, Sun, Uchiyama, Li, & Okawa, 2000; Moilanen et al., 1998; Rutter, Yule, & Graham, 1973; Van Hoecke, Hoebeke, Braet, & Walle, 2004; Van Hoecke, De Fruyt, De Clercq, Hoebeke, & Vande Walle, 2005; Von Gontard, Mauer-Mucke, Pluck, Berner, & Lehmkuhl, 1999), attention-deficit hyperactivity disorder (Baeyens et al., 2004; Robson, Jackson, Blackhurst, & Leung, 1997), and reduced self-esteem (Hagglof, Andren, Bergstrom, Marklund, & Wendelius, 1998; Theunis, Van Hoecke, Paesbrugge, Hoebeke, & Vande Walle, 2002). There is also growing evidence that children with combined wetting have a higher rate of psychological problems compared with children who suffer from isolated bedwetting (Berg, Fielding, & Meadow, 1977; Hallgren, 1957; Theunis et al., 2002; Van Hoecke et al., 2005). However, one study reported no difference in self-esteem levels between children with bedwetting compared with combined wetting (Collier, Butler, Redsell, & Evans, 2002).

Several limitations affect the generalizability of these studies. First of all, some of the bedwetting studies have failed to distinguish between children with isolated bedwetting and those with combined (day and night) wetting. Many are based on clinic samples making it difficult to generalize the findings to the total population of children with wetting problems. In addition, some of the studies have drawn the wetting and control groups from different populations making them difficult to compare, while some studies have failed to include a nonwetting comparison group. Another weakness is that the majority of studies are based on parental reports, with only a few including reports from children, none of which ask children about social problems associated with bedwetting such as teasing or bullying.

There is also a lot of variation between studies in the inclusion criteria for enuresis, with some including only the children whose wetting meets DSM-IV criteria for enuresis while others include children with less frequent wetting (e.g., once a week). In a population-based study Byrd et al. (1996) reported that bedwetting, even as infrequently as once every other month, is associated with increased rates of behavior problems. This has not yet been investigated in relation to combined wetting.

The present study, based on a UK population of over 8,000 children, is an investigation of the psychological problems associated with bedwetting and combined wetting in children aged around 7½ years. Based on reports from parents and children, the study compares the rate of internalizing and externalizing problems and

problems with bullying and friendships in children who wet the bed, those with combined wetting and in children with no wetting problems. It is hypothesized that there will be elevated rates of internalizing and externalizing problems in children with combined wetting compared with children with bedwetting alone. The study will also investigate whether children with less severe bedwetting or combined wetting that does meet DSM-IV criteria for enuresis are also at greater risk of internalizing and externalizing problems compared with children with no wetting problems.

Methods

Participants

The Avon Longitudinal Study of Parents and Children (ALSPAC: Golding, Pembrey, & Jones, 2001) is an ongoing population-based study investigating a wide range of environmental and other influences on the health and development of children. Pregnant women residing in the former Avon Health Authority in south-west England, having an estimated date of delivery between April 1, 1991 and December 31, 1992 were invited to take part, resulting in a cohort of 14,541 pregnancies and 13,971 children alive at 12 months of age. The primary source of data collection was via self-completion questionnaires administered at four points during the prenatal period then at regular intervals following birth. The representative nature of the ALSPAC sample has been investigated by comparison with the 1991 National Census data of mothers with infants under 1 year of age who were residents in the county of Avon. The ALSPAC sample had a slightly greater proportion of mothers who were married or cohabiting, who were owner-occupiers (people who owned or had a mortgage on their house rather than living in rented accommodation) and who had a car in the household. All aspects of the study are reviewed and approved by the ALSPAC Law and Ethics Committee, which is registered as an Institutional Review Board. Approval was also obtained from the Local Research Ethics Committees, which are governed by the Department of Health. Written consent was not required by these committees for either postal questionnaires or interviews, as returning of questionnaires and attendance at the clinics was entirely voluntary. More detailed information on the ALSPAC study is available on the web site: <http://www.alspac.bris.ac.uk>.

Both wetting data and parent-reported psychological outcomes were taken from a questionnaire administered to the parents when the children were around 7½ years

of age. This questionnaire was sent to 11,021 families and 8,242 questionnaires were returned (in 98% of the cases the respondent was the mother of the study child; age range of children = 90–111 months, median = 91 months, 95% of assessments completed by 95 months). Reports of bedwetting in a previous questionnaire given at 78 months were not related to the rate of response to the current questionnaire (of those bedwetting at 78 months, 87.4% returned the 91-month questionnaire compared with 86% of those who were not wetting the bed).

Child-reported psychological measures were taken from a clinic attended by 7,171 children (age range = 97–125 months, median = 102 months, 95% of assessments completed by 110 months). The proportion of children attending the clinic was higher for those who wet the bed (79.4% attended) compared with those who were not wetting the bed at 91 months (74.6% attended) ($\chi^2 = 12.5, p < .001$).

Among the children for whom wetting data was available, those with a WISC-III IQ (Wechsler, 1991) <70 and/or who had received a statement of special educational needs ($n = 278$) and those whose parents had failed to provide information on bedwetting ($n = 29$) were excluded leaving a study sample of 7,935 (51% males, 49% females). Of the 7,935 children, 6,386 had no wetting problems, 951 had bedwetting alone, 241 had combined (day and night) wetting. An additional group ($n = 357$) with daytime wetting alone were not included in the analyses because this was not the main topic of the article (see Table I for a breakdown of wetting groups by gender and DSM-IV status).

Measures

The self-report questionnaire, given to parents when children were $\sim 7\frac{1}{2}$ years of age, contained questions concerning how often the child wets the bed at night or during the day, with the following options: (a) never,

(b) occasional accidents but less than once a week, (c) about once a week, (d) 2–5 times a week, (e) nearly every day, and (f) more than once a day. Also included in this questionnaire was “The Development and Well-Being Assessment” (DAWBA: Goodman, Ford, Richards, Gatward, & Meltzer, 2000), comprising questions relating to a number of common internalizing and externalizing disorders in children occurring in the present and recent past.

Children were invited to attend a clinic in which they were interviewed using the following schedules: (a) A modified version of the Bullying and Friendship Interview Schedule (BFIS: Woods & Wolke, 2003); (b) 11 items from the Self-Reported Antisocial Behavior for Young Children Questionnaire (Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1989); (c) a reduced (12 item) version of Harter’s Self-Perception Profile for Children (SPPC: Harter, 1985); and (d) five questions from the Cambridge Hormones and Moods Project Friendship Questionnaire (Goodyer, Wright, & Altham, 1990) (see Appendix I for a description of these measures and prevalence of the child-reported problems). Due to the sensitive nature of some of the questions, children were required to post their response in either a YES or a NO box. The interviewer could not see which box was chosen and stressed that all answers would be confidential.

Analysis

The small numbers of children meeting DSM-IV criteria for psychiatric disorders in the ALSPAC study population [range = 0.2% (social phobia) to 1.9% (oppositional-defiant disorder)] precluded a multivariable regression analysis. Consequently, a set of dichotomous outcome variables was derived from the lists of symptoms in the DAWBA relating to each psychiatric disorder. This permitted a more rigorous multivariable analysis of the association of bedwetting and combined wetting with

Table I. Breakdown of Bedwetting and Daytime Wetting by Gender and Frequency of Wetting

		Bedwetting		
		None	Less than twice a week (not DSM-IV)	Twice a week or more (DSM-IV)
Daywetting	None	6,386	815	136
		Male: 3,108 (48.7%)	Male: 568 (69.7%)	Male: 96 (70.6%)
		Female: 3,278 (51.3%)	Female: 247 (30.3%)	Female: 40 (29.4%)
	Less than twice a week (not DSM-IV)	329	162	38
		Male: 123 (37.4%)	Male: 89 (54.9%)	Male: 27 (71.1%)
		Female: 206 (62.6%)	Female: 73 (45.1%)	Female: 11 (28.9%)
	Twice a week or more (DSM-IV)	28	21	20
		Male: 10 (35.7%)	Male: 3 (14.3%)	Male: 12 (60.0%)
		Female: 18 (64.3%)	Female: 18 (85.7%)	Female: 8 (40.0%)

emotional and behavior problems with adjustments for confounding variables. In deriving the dichotomous outcome variables based on reported symptoms of psychiatric disorders, only the children who were reported to have suffered from the symptoms the most often, or a lot more than others of the same age were included in the group with internalizing or externalizing problems. For instance, in determining whether a child had any separation anxiety symptoms (e.g., has he/she worried about sleeping alone?), only the children whose parents reported in the DAWBA that they had symptoms “a lot more than others” of the same age were placed in the symptom group and children who had the symptoms “no more than others” or “a little more than others” were not counted as having symptoms. (Appendix II for prevalence in the study population of DSM-IV disorders, prevalence of psychological problems derived from the DAWBA and a description of how they were derived).

Most of the clinic measures were already categorical, but scores on the SPPC and the Friendship Questionnaire are continuous. To aid comparison with the rest of the analyses these were dichotomized so that children with the lowest scores on the SPPC (lowest self-esteem) and those with the highest scores on the Friendship Questionnaire (least happy with friendships) were in the top quartile (Appendix 1).

Preliminary analyses consisted of χ^2 tests to compare the rate of parent-reported internalizing and externalizing problems derived from the DAWBA and child-reported problems in children who wet the bed, those with combined wetting and children with no wetting problems. Main analyses comprised multivariable logistic regression models examining the association of the psychological problems in the three groups. Analyses adjusted for the effect of confounding variables including gender (51.5% male) and stressful life events (assessed using the question ‘has anything exceptionally stressful happened to him/her that would really upset almost anyone?’ 12.2% of parents responded positively to this question). Stressful life events are thought to be a risk factor for both enuresis and psychological problems (Kalo & Bella, 1996; Mesman & Koot, 2001).

Analyses also adjusted for family socio-demographic background derived from variables in questionnaires administered during the prenatal period including home ownership status (82% mortgaged/owned their house, 18% living in rented accommodation), car ownership (5.9% did not own a car), crowding (persons per room in house—4.3% had a crowding ratio of at least 0.75, 47.9% had an ratio of <0.5 i.e., more than two rooms

per person), mother’s education (22.9% with limited educational qualifications, 41.7% with college education or higher), mother’s age (2.2% < 20 years, 13.8% 20–24 years, 39.8% 25–29 years, 32.5% 30–34 years, 11.6% > 34 years), birth order (46.2% first born, 18.4% third child or higher) and marital status (14.1% never married, 4.9% widowed/separated/divorced, 6.8% in second marriage). Low socioeconomic status has been found to be a risk factor for the development of wetting problems (Mark & Frank, 1995; Steinhausen & Gobel, 1989) and behavior problems (Campbell, 1995) and has been described as a common factor underlying the two conditions (Van Hoeke et al., 2003).

The logistic regression analyses were repeated after removing children who attained DSM-IV levels of enuresis (bedwetting or daytime wetting occurring at least twice a week) in order to address whether any observed group differences could be explained by children who had the most severe wetting problems. In the multivariable models, missing data on confounding variables resulted in a loss of almost 10% of the sample when the fully adjusted models were derived. To avoid any potential bias that might result from performing a complete-case model on these variables, a missing data imputation technique was employed (MICE—Missing Imputation for Chained Equations: van Buuren, Boshuizen, & Knook, 1999) using the procedure in STATA known as *ice* (Royston, 2005). Imputation was restricted to confounding variables (no imputation of the outcome or the wetting variables was performed).

Results

Table II shows the rate of internalizing and externalizing problems reported by parents (from the symptom-based dichotomous outcome variables derived from the DAWBA) and the rate of child-reported problems (from the clinic-based assessments) in children with no wetting problems (controls), in children with bedwetting, and in those with combined wetting. It also shows the prevalence of each variable in the study population (the rate of relational bullying was too rare for any further analysis).

The results show strong evidence for group differences in the rate of all the parent-reported psychological problems and two of the child-reported measures (victim of overt bullying and antisocial activities). *Post hoc* comparisons showed that this was generally due to differences in risk of adverse outcomes between children with no wetting problems and those with bedwetting or

Table II. Rates of Psychological Problems in Children with Bedwetting, Combined Wetting, and no Wetting Problems

	Population <i>n</i>	Population (%)	No wetting	Bedwetting	Combined wetting	χ^2, p
Parent-reported measures						
Separation anxiety	7,408	6.9	400 (6.4%)	74 (8.0%)	28 (11.8%)	12.9, $p = .002$
Social fears	7,454	4.9	290 (4.6%)	66 (7.0%)	13 (5.5%)	10.9, $p = .006$
Particular fears	7,560	12	733 (11.5%)	134 (14.1%)	37 (15.4%)	8.6, $p = .018$
General anxiety	7,511	8.3	490 (7.7%)	99 (10.5%)	29 (12.0%)	13.9, $p = .001$
Sadness/depression	7,373	11.6	676 (10.9%)	132 (14.2%)	27 (11.4%)	9.0, $p = .011$
Attention/activity problems	7,456	13.2	750 (11.9%)	165 (17.6%)	55 (23.1%)	46.2, $p < .001$
Oppositional behavior	7,498	5.5	298 (4.7%)	82 (8.8%)	28 (11.8%)	44.3, $p < .001$
Conduct problems	7,476	6.4	356 (5.7%)	80 (8.5%)	31 (12.9%)	30.1, $p < .001$
Child-reported measures						
Overt bully	3,905	9.1	291 (8.8%)	54 (11.1%)	15 (12.3%)	4.0, $p = .135$
Relational bully	4,562	2.6	102 (2.7%)	13 (2.2%)	3 (2.0%)	0.7, $p = .702$
Overt victim	5,364	33.9	1486 (33.1%)	264 (37.9%)	69 (39.2%)	8.4, $p = .015$
Relational victim	5,280	15.7	700 (15.9%)	112 (16.2%)	24 (13.8%)	0.6, $p = .734$
Scholastic competence (≤ 14)	5,316	23.7	1025 (23.1%)	188 (26.8%)	46 (26.0%)	5.2, $p = .075$
Global self-worth (≤ 16)	5,308	19.8	862 (19.4%)	153 (21.9%)	37 (21.3%)	2.5, $p = .295$
Antisocial activities	5,447	21.6	951 (20.9%)	177 (24.5%)	56 (31.3%)	14.6, $p = .001$
Friendship score (≥ 6)	5,451	17.5	794 (17.4%)	131 (18.5%)	37 (20.6%)	1.6, $p = .457$

combined wetting. However, differences were found between the children with bedwetting and combined wetting in oppositional behavior ($p = .05$) and conduct problems ($p = .04$).

Table III shows the odds ratios (OR; both unadjusted and adjusted) and 95% confidence intervals (CI) for the analyses with the parent-reported measures derived from the DAWBA and Table IV shows the results from the clinic-based assessment of the children. The first set of models (columns 1 and 2) include children with any bedwetting or combined wetting and the second set of models (columns 3 and 4) exclude the children whose bedwetting or daytime wetting was severe enough to meet DSM-IV criteria.

The results in Table III show that for most of the parent-report measures, the risk of psychological problems is higher for children with bedwetting and combined wetting compared with those with no wetting problems. The effect of adjusting for confounders varied from negligible (e.g., separation anxiety) to moderate (e.g., oppositional behavior) and in some cases, such as particular fears, regression estimates were raised mainly due to slight gender differences between bedwetting/combined wetting, and some of the psychological measures. Adjustment did not alter any of the conclusions for these analyses, that is, those children with bedwetting/combined wetting are at increased risk of most outcomes (particularly attention/activity problems, oppositional behavior, and conduct problems), with the

exception of social fears and sadness/depression where the combined group are at no greater risk than the controls but rates of these problems were elevated in children who suffered from bedwetting alone. Furthermore, with these two exceptions, ORs for children with combined wetting were higher than for children with bedwetting and *post hoc* analyses showed that in some cases the difference between these two groups was considerable [separation anxiety: OR = 1.62 (1.01, 2.60), $p = .045$; attention/activity problems: OR = 1.56 (1.09, 2.22), $p = .014$; conduct problems: OR = 1.63 (1.03, 2.56), $p = .035$]. As one might expect, exclusion of the children with DSM-IV nocturnal and diurnal enuresis led to an attenuation of the majority of the estimates; however, the substantive conclusions remain.

For the child-reported outcomes in Table IV there is much less evidence to suggest differences between the three groups. The apparent increased risk of antisocial activities for children with combined wetting should be taken lightly given the number of tests performed, the amount of attenuation following adjustment and also the size of the p -value for the adjusted estimates. It is notable that the effect of adjusting for confounders (particularly gender) was considerably greater for the child-reported compared with the parent-reported outcomes (many estimates were reduced by 50% or more). It is not surprising that the removal of the children with DSM-IV enuresis had little effect on the conclusions for this set of outcomes.

Table III. Odds Ratios (95% CI) for Parent-reported Psychological Problems in Children with Bedwetting and Combined Wetting Compared with Children with no wetting; Adjusting for Gender, Socio-demographic Background and Stressful Life Events

		Any bedwetting/Combined wetting		Excluding DSM-IV wetting	
		Unadjusted	Adjusted	Unadjusted	Adjusted
Separation anxiety	Bedwetting	1.27 [0.98, 1.65]	1.21 [0.93, 1.58]	1.24 [0.93, 1.63]	1.17 [0.88, 1.56]
	Combined	1.95 [1.30, 2.93]	1.96 [1.29, 2.98]	1.98 [1.22, 3.24]	2.04 [1.23, 3.36]
		<i>p</i> = .002	<i>p</i> = .004	<i>p</i> = .010	<i>p</i> = .014
Social fears	Bedwetting	1.56 [1.18, 2.05]	1.42 [1.08, 1.89]	1.48 [1.10, 2.00]	1.35 [1.00, 1.83]
	Combined	1.21 [0.68, 2.14]	1.15 [0.65, 2.05]	0.97 [0.45, 2.09]	0.92 [0.43, 2.00]
		<i>p</i> = .007	<i>p</i> = .05	<i>p</i> = .037	<i>p</i> = .146
Particular fears	Bedwetting	1.26 [1.03, 1.54]	1.34 [1.10, 1.65]	1.20 [0.97, 1.49]	1.28 [1.03, 1.59]
	Combined	1.40 [0.98, 2.01]	1.44 [1.00, 2.07]	1.41 [0.92, 2.18]	1.48 [0.95, 2.29]
		<i>p</i> = .018	<i>p</i> = .004	<i>p</i> = .087	<i>p</i> = .025
General anxiety	Bedwetting	1.40 [1.12, 1.76]	1.40 [1.11, 1.77]	1.37 [1.07, 1.75]	1.37 [1.07, 1.76]
	Combined	1.63 [1.09, 2.43]	1.65 [1.10, 2.47]	1.40 [0.84, 2.33]	1.41 [0.84, 2.37]
		<i>p</i> = .001	<i>p</i> = .002	<i>p</i> = .022	<i>p</i> = .025
Sadness/depression	Bedwetting	1.36 [1.11, 1.66]	1.40 [1.14, 1.72]	1.32 [1.06, 1.63]	1.37 [1.09, 1.71]
	Combined	1.06 [0.70, 1.59]	1.07 [0.71, 1.62]	1.18 [0.73, 1.89]	1.21 [0.75, 1.96]
		<i>p</i> = .011	<i>p</i> = .006	<i>p</i> = .039	<i>p</i> = .019
Attention/activity problems	Bedwetting	1.58 [1.32, 1.90]	1.44 [1.19, 1.74]	1.54 [1.26, 1.87]	1.41 [1.15, 1.72]
	Combined	2.23 [1.64, 3.05]	2.24 [1.63, 3.08]	2.46 [1.70, 3.54]	2.51 [1.73, 3.65]
		<i>p</i> < .001	<i>p</i> < .001	<i>p</i> < .001	<i>p</i> < .001
Oppositional behavior	Bedwetting	1.93 [1.50, 2.49]	1.69 [1.30, 2.20]	1.89 [1.44, 2.48]	1.68 [1.27, 2.22]
	Combined	2.68 [1.78, 4.04]	2.56 [1.67, 3.90]	2.53 [1.53, 4.18]	2.45 [1.46, 4.11]
		<i>p</i> < .001	<i>p</i> < .001	<i>p</i> < .001	<i>p</i> < .001
Conduct problems	Bedwetting	1.56 [1.21, 2.00]	1.47 [1.14, 1.91]	1.44 [1.09, 1.90]	1.38 [1.04, 1.83]
	Combined	2.46 [1.66, 3.65]	2.39 [1.60, 3.58]	2.76 [1.75, 4.35]	2.87 [1.80, 4.58]
		<i>p</i> < .001	<i>p</i> < .001	<i>p</i> < .001	<i>p</i> < .001

Discussion

This is the first population-based study to investigate whether children with combined wetting have a higher rate of psychological problems compared with children with bedwetting alone. The study found a higher rate of parent-reported externalizing and internalizing problems in children with combined wetting than for children with bedwetting alone (with the exception of social fears and sadness/depression where the rate was higher in bedwetting children). The biggest differences were found for externalizing problems with the rates of attention, oppositional, and conduct problems in children with combined wetting well over twice those found in children with no wetting problems. This agrees with findings of previous studies reporting more psychiatric disturbance in children with combined wetting compared with those who only wet the bed (Hallgren, 1957; Berg et al., 1977; Van Hoecke et al. 2005; Theunis et al., 2002). However, one study found no difference in the rate of attention and activity problems in children with combined wetting compared with those with bedwetting alone (Baeyens et al., 2004). Future investigations of children with

bedwetting should take into account those with combined wetting because, due to its public nature, it likely to be associated with social humiliation, teasing from peers, and intolerance from parents and might make this group of children particularly vulnerable to psychological distress (Butler, 1998). Adjusting for confounding variables (gender, socio-demographic background, stressful life events) did not alter any of the main conclusions suggesting that these variables do not represent underlying risk factors for psychological problems in the study population.

In order to investigate whether children with the most frequent wetting were driving the observed group differences in the rate of psychological problems in the present study, analyses were repeated after removing children with enuresis that met DSM-IV criteria. This resulted in an attenuation of the majority of the estimates; however, the substantive conclusions remained. These findings provide evidence for an association of psychological problems with bedwetting and combined wetting even in children whose wetting does not meet DSM-IV criteria. This is in agreement with

Table IV. Odds Ratios (95% CI) for Child-reported Problems in Children with Bedwetting and Combined Wetting Compared with Children with no Wetting; Adjusting for Gender, Socio-demographic Background and Stressful Life Events

		Any bedwetting/Combined wetting		Excluding DSM-IV wetting	
		Unadjusted	Adjusted	Unadjusted	Adjusted
Overt bully	Bedwetting	1.29 [0.95, 1.75]	1.00 [0.73, 1.37]	1.29 [0.93, 1.78]	1.00 [0.71, 1.39]
	Combined	1.45 [0.83, 2.52]	1.26 [0.72, 2.23]	1.32 [0.68, 2.59]	1.13 [0.57, 2.25]
		<i>p</i> = .136	<i>p</i> = .721	<i>p</i> = .243	<i>p</i> = .940
Overt victim	Bedwetting	1.23 [1.05, 1.45]	1.12 [0.95, 1.33]	1.23 [1.03, 1.46]	1.12 [0.93, 1.34]
	Combined	1.30 [0.96, 1.78]	1.26 [0.92, 1.73]	1.19 [0.82, 1.73]	1.15 [0.79, 1.67]
		<i>p</i> = .015	<i>p</i> = .166	<i>p</i> = .052	<i>p</i> = .389
Relational victim	Bedwetting	1.03 [0.83, 1.28]	1.07 [0.86, 1.34]	1.06 [0.84, 1.33]	1.12 [0.88, 1.41]
	Combined	0.85 [0.55, 1.32]	0.85 [0.55, 1.32]	0.80 [0.47, 1.36]	0.80 [0.47, 1.36]
		<i>p</i> = .735	<i>p</i> = .612	<i>p</i> = .619	<i>p</i> = .446
Scholastic competence	Bedwetting	1.22 [1.02, 1.46]	1.22 [1.01, 1.46]	1.18 [0.97, 1.44]	1.19 [0.97, 1.44]
	Combined	1.17 [0.83, 1.65]	1.13 [0.80, 1.60]	1.36 [0.91, 2.02]	1.33 [0.89, 1.99]
		<i>p</i> = .075	<i>p</i> = .099	<i>p</i> = .092	<i>p</i> = .108
Global self-worth	Bedwetting	1.16 [0.95, 1.41]	1.09 [0.89, 1.32]	1.21 [0.98, 1.48]	1.14 [0.92, 1.40]
	Combined	1.12 [0.77, 1.62]	1.06 [0.73, 1.54]	1.08 [0.69, 1.69]	1.03 [0.66, 1.62]
		<i>p</i> = .293	<i>p</i> = .689	<i>p</i> = .189	<i>p</i> = .483
Antisocial activities	Bedwetting	1.23 [1.02, 1.47]	1.03 [0.85, 1.25]	1.20 [0.99, 1.46]	1.01 [0.83, 1.24]
	Combined	1.72 [1.25, 2.38]	1.56 [1.12, 2.17]	1.49 [1.00, 2.21]	1.34 [0.89, 2.01]
		<i>p</i> = .001	<i>p</i> = .031	<i>p</i> = .035	<i>p</i> = .378
Friendship score	Bedwetting	1.08 [0.88, 1.32]	1.05 [0.85, 1.29]	1.06 [0.85, 1.32]	1.03 [0.82, 1.28]
	Combined	1.23 [0.85, 1.78]	1.20 [0.82, 1.74]	1.11 [0.70, 1.74]	1.09 [0.69, 1.71]
		<i>p</i> = .457	<i>p</i> = .604	<i>p</i> = .796	<i>p</i> = .915

a previous study that found an increased risk of behavior problems in children with infrequent bedwetting compared with controls (Byrd et al., 1996). Furthermore, this supports the view that whilst the DSM-IV criteria for enuresis may prove clinically useful in terms of treatment, it represents an arbitrary cut-off with respect to psychological consequences.

Most previous studies of the psychological problems associated with bedwetting are based on parental reports; however, it is possible that parents of children who wet the bed might overestimate psychological issues relating to their child. Evidence for this is provided by the results of a study reporting no difference in the rate of children's self-reports relating to social anxiety or depression, whereas parents rated children who wet the bed as more withdrawn and anxious/depressed (Van Hoecke et al., 2004). In the present study, parents reported a higher rate of internalizing and externalizing problems in wetting compared with nonwetting children, but there was little evidence from children's self-reports to suggest that children with bedwetting or combined wetting have more problems than those with no wetting. The discrepancy between parent and child ratings of psychological problems is well-documented in the literature with consistent reports that externalizing and internalizing

problems are more readily identified by parents than by children (Kemper, Gerhardstein, Repper, & Kistner, 2003; Sawyer, Baghurst, & Mathias, 1992; Stanger & Lewis, 1993). It is possible that the current findings were compounded by a bias in parental rating, with parents of children with bedwetting or combined wetting viewing them more negatively than those with no wetting problems. It is also possible that young children might fail to perceive a problem or underestimate its severity in self-reports; however, the way in which children in this study were asked sensitive questions in the interview (by posting their responses in either a YES or a NO box that the interviewer could not see) should have helped to minimize any such problems. Another possible explanation for parent/child differences in this study is that parents were asked about different issues (internalizing and externalizing problems) compared with children (bullying, friendships, and self-esteem), which may imply that children with bedwetting/combined wetting have distinct psychological problems.

In the current study, children with bedwetting or combined wetting did not have reduced self-esteem compared with those with no wetting problems. This is in agreement with previous studies reporting no evidence to suggest that children with bedwetting or combined

wetting construe themselves more negatively than children with no wetting problems (Robinson et al., 2003; Van Hoecke et al., 2004; Wagner & Geffken, 1986; Wille & Anvenden, 1995). However, other studies have reported reduced self-esteem in children with bedwetting compared with children who are dry at night (Hagglof et al., 1998; Theunis et al., 2002). Furthermore, one study reported lower self-esteem scores (relating to scholastic competence) in children with combined wetting compared with those with bedwetting alone (Theunis et al., 2002), while another reported no difference in self-esteem levels between these groups (Collier et al., 2002). Such a discrepancy of findings might be a result of the different scales employed to measure self-esteem.

A weakness of the study is that the small numbers of children who met DSM-IV criteria for psychiatric disorders prevented an adequate multivariable statistical analysis using the proper diagnoses derived from the DAWBA. Instead, the study compared children on the rate of symptoms of internalizing and externalizing disorders. Although this had the advantage of permitting a more rigorous multivariable statistical analysis, the impact of the symptoms in terms of resultant distress and interference with family life, learning, friendships, and leisure activities was not considered. The fact that children can have symptoms of disorders but are not necessarily significantly impaired by them means that the rate of parent-reported psychological problems might have been overestimated in the present study. However, in deriving the dichotomous outcome variables based on reported symptoms of psychiatric disorders, only the children with the most 'severe' symptoms (children who were reported to have suffered from the symptoms the most often, or a lot more than others of the same age) were included in the group with emotional or behavioral problems.

It is also possible that in the present study, symptom categories may not be independent and that the psychological problems identified in children with wetting problems are indicators of comorbid psychiatric disorders. For example, attention and activity problems and oppositional behavior often occur together, as do anxiety and depression. There was some overlap between domains in the DAWBA, but of the children who were reported to have internalizing or externalizing problems many (around 70%) had symptoms in only one domain.

According to DSM-IV criteria, enuresis should be present for at least 3 months, however, in our study parents were not asked about the duration of wetting. When rates of wetting were measured at a previous time point in the ALSPAC data it was found that of the 7,935

with information on bedwetting and daytime wetting at 91 months, 7,061 also responded to a previous questionnaire given at 78 months. Among the group reported to be bedwetting at least twice a week at 91 months, 77.5% were also bedwetting to this degree at 78 months. This suggests that bedwetting at DSM-IV levels is a long-term problem for these children. Another weakness relating to the wetting measures is that they were taken around 6–12 months after the parent measures and this could potentially confound the interpretation of the results, especially if the wetting problem had resolved within this period.

Differential attrition is a problem with all longitudinal cohort studies. In the present study, this could mean that the sub-sample responding to the questionnaire or attending the clinic are more socially advantaged than those who defaulted. However, there does not appear to be a relationship between dropout and bedwetting and controlling for socio-demographic variables had only a negligible effect on the regression estimates. As socio-demographic variables are good predictors of attrition, this would lead us to infer that there is not a great deal of bias present in our final adjusted models and that the results can be generalized to the ALSPAC population as a whole.

As with all cross-sectional studies, it is unclear whether the psychological problems found in the present study are a cause or a consequence of bedwetting. It could be argued that the distress caused to the child as a result of bedwetting and parental intolerance of the problem may contribute to the development of psychological problems (Butler, 1998). The fact that some studies have demonstrated improvements in psychological functioning following successful treatment for bedwetting provides support for this argument (Hagglof et al., 1998; Hirasing, van Leerdam, Bolk-Bennink, & Koot, 2002; Longstaffe, Moffatt, & Whalen, 2000; Moffatt, Kato, & Pless, 1987; Theunis et al., 2002). The presence of psychological problems, particularly the increased vulnerability to behavior problems, in children with bedwetting and combined wetting has important implications for treatment. For example, early withdrawal from treatment or treatment failure with the enuresis alarm is more likely when children are perceived to have behavior problems (Geffken, Johnson, & Walker, 1986; Moffatt & Cheang, 1995). Further analysis of the ALSPAC data longitudinally will look at the association between bedwetting and the development of psychological problems, particularly in association with the age at which toilet training commenced, parental child-rearing practices, child's temperament, and early stresses.

Acknowledgments

We are extremely grateful to all the families who took part in this study, the midwives for their help in recruiting them, and the whole ALSPAC team, which includes interviewers, computer, and laboratory technicians, clerical workers, research scientists, volunteers, managers, receptionists, and nurses. The UK Medical Research Council, the Wellcome Trust and the University of Bristol provide core support for ALSPAC. This publication is the work of the authors who also serve as guarantors for the contents of this article. This research was specifically funded by a grant from the Big Lottery Fund and has been carried out in collaboration with the charity ERIC (Education and Resources for Improving Childhood Continence).

Conflict of interest: None declared.

Received January 5, 2006; revisions received April 28, 2006 and October 2, 2006; accepted October 3, 2006

References

- American Psychiatric Association (1995). *Diagnostic and statistical manual of mental disorders: DSM-IV* (4th ed.), Washington DC: American Psychiatry Press.
- Baeyens, D., Roeyers, H., Hoebeke, P., Verte, S., Van Hoecke, E., & Walle, J. V. (2004). Attention deficit/hyperactivity disorder in children with nocturnal enuresis. *Journal of Urology*, *171*, 2576–2579.
- Berg, I., Fielding, D., & Meadow, R. (1977). Psychiatric disturbance, urgency, and bacteriuria in children with day and night wetting. *Archives of Disease in Childhood*, *52*, 651–657.
- Bower, W. F., Moore, K. H., Shepherd, R. B., & Adams, R. D. (1996). The epidemiology of childhood enuresis in Australia. *British Journal of Urology*, *78*, 602–606.
- Butler, R. J. (1994). *Nocturnal enuresis: The child's experience*. Oxford: Butterworth Heineman.
- Butler, R. J. (1998). Annotation: Night wetting in children: Psychological aspects. *Journal of Child Psychology and Psychiatry*, *39*, 453–463.
- Butler, R. J., Golding, J., & Northstone, K. (2005). Nocturnal enuresis at 7.5 years old: Prevalence and analysis of clinical signs. *BJU Int*, *96*, 404–410.
- Byrd, R. S., Weitzman, M., Lanphear, N. E., & Auinger, P. (1996). Bed-wetting in US children: Epidemiology and related behavior problems. *Pediatrics*, *98*, 414–419.
- Campbell, S. B. (1995). Behavior problems in preschool children. A review of research. *Journal of Child Psychology and Psychiatry*, *36*, 113–149.
- Chang, S. S., Ng, C. F., & Wong, S. N. (2002). Behavioral problems in children and parenting stress associated with primary nocturnal enuresis in Hong Kong. *Acta Paediatrica*, *91*, 475–479.
- Collier, J., Butler, R. J., Redsell, S. A., & Evans, J. H. (2002). An investigation of the impact of nocturnal enuresis on children's self-concept. *Scandinavian Journal of Urology and Nephrology*, *36*, 204–208.
- Couchells, S. M., Johnson, S. B., Carter, R., & Walker, D. (1981). Behavioral and environmental characteristics of treated and untreated enuretic children and matched nonenuretic controls. *The Journal of Pediatrics*, *99*, 812–816.
- Feehan, M., McGee, R., Stanton, W., & Silva, P. A. (1990). A 6 year follow-up of childhood enuresis: Prevalence in adolescence and consequences for mental health. *Journal of Paediatrics and Child Health*, *26*, 75–79.
- Fergusson, D. M., & Horwood, L. J. (1994). Nocturnal enuresis and behavioral problems in adolescence: A 15-year longitudinal study. *Pediatrics*, *94*, 662–668.
- Friman, P. C., Handwerk, M. L., Swearer, S. M., McGinnis, J. C., & Warzak, W. J. (1998). Do children with primary nocturnal enuresis have clinically significant behavior problems? *Archives of Pediatric and Adolescent Medicine*, *152*, 537–539.
- Geffken, G., Johnson, S. B., & Walker, D. (1986). Behavioral interventions for childhood nocturnal enuresis: The differential effect of bladder capacity on treatment progress and outcome. *Health Psychology*, *5*, 261–272.
- Golding, J., Pembrey, M., & Jones, R. (2001). ALSPAC—The Avon Longitudinal Study of Parents and Children. I. Study Methodology. *Paediatrics & Perinatal Epidemiology*, *15*, 74–87.
- Goodman, R., Ford, T., Richards, H., Gatward, R., & Meltzer, H. (2000). The Development and Well-Being Assessment: Description and initial validation of an integrated assessment of child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry*, *41*, 645–655.
- Goodyer, I., Wright, C., & Altham, P. M. E. (1990). Recent achievements and adversities in anxious and depressed school age children. *Journal of Child Psychology and Psychiatry*, *31*, 1063–1077.
- Hagglof, B., Andren, O., Bergstrom, E., Marklund, L., & Wendelius, M. (1998). Self-esteem in children

- with nocturnal enuresis and urinary incontinence: Improvement of self-esteem after treatment. *European Urology*, 33, Suppl 3), 16–19.
- Hallgren, B. (1957). Enuresis: A clinical and genetic study. *Acta Psychiatr Neurol Scand*, 32, Suppl 114), 1–159.
- Harter, S. (1985). *Self-perception profile for children*. Denver, CO: University of Denver Press.
- Hirasing, R. A., van Leerdam, F. J., Bolk-Bennink, L. B., & Bosch, J. D. (1997). Bedwetting and behavioral and/or emotional problems. *Acta Paediatrica*, 86, 1131–1134.
- Hirasing, R. A., van Leerdam, F. J., Bolk-Bennink, L. F., & Koot, H. M. (2002). Effect of dry bed training on behavioural problems in enuretic children. *Acta Paediatrica*, 91, 960–964.
- Kalo, B. B., & Bella, H. (1996). Enuresis: Prevalence and associated factors among primary school children in Saudi Arabia. *Acta Paediatrica*, 85, 1217–1222.
- Kemper, T. S., Gerhardstein, R., Repper, K. K., & Kistner, J. A. (2003). Mother-child agreement on reports of internalizing symptoms among children referred for evaluation of ADHD. *Journal of Psychopathology and Behavioural Assessment*, 24, 239–250.
- Liu, X., Sun, Z., Uchiyama, M., Li, Y., & Okawa, M. (2000). Attaining nocturnal urinary control, nocturnal enuresis, and behavioral problems in Chinese children aged 6 through 16 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39, 1557–1564.
- Loeber, R., Stouthamer-Loeber, M., Van Kammen, W. B., & Farrington, D. P. (1989). Development of a new measure of self-reported antisocial behavior for young children: Prevalence and reliability. In M. Klein (Ed.), *Cross-national research in self-reported crime and delinquency* (pp. 203–225). Boston MA: Kluwer-Nijhoff.
- Longstaffe, S., Moffatt, M. E., & Whalen, J. C. (2000). Behavioral and self-concept changes after six months of enuresis treatment: a randomized, controlled trial. *Pediatrics*, 105, 935–940.
- Mark, S. D., & Frank, J. D. (1995). Nocturnal enuresis. *British Journal of Urology*, 75, 427–434.
- Mesman, J., & Koot, H. M. (2001). Early preschool predictors of preadolescent internalizing and externalizing DSM-IV diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1029–1036.
- Moffatt, M. E. K., & Cheang, M. (1995). Predicting treatment outcome with conditioning alarms. *Scandinavian Journal of Urology and Nephrology Supplement*, 173, 119–122.
- Moffatt, M. E., Kato, C., & Pless, I. B. (1987). Improvements in self-concept after treatment of nocturnal enuresis: randomized controlled trial. *The Journal of Pediatrics*, 110, 647–652.
- Moilanen, I., Tirkkonen, T., Jarvelin, M. R., Linna, S. L., Almqvist, F., Piha, J., et al. (1998). A follow-up of enuresis from childhood to adolescence. *British Journal of Urology*, 81, Suppl 3), 94–97.
- Robinson, J. C., Butler, R. J., Holland, P., & Doherty-Williams, D. (2003). Self-construing in children with primary mono-symptomatic nocturnal enuresis: An investigation of three measures. *Scandinavian Journal of Urology and Nephrology*, 37, 124–128.
- Robson, W. L., Jackson, H. P., Blackhurst, D., & Leung, A. K. (1997). Enuresis in children with attention-defecit hyperactivity disorder. *Southern Medical Journal*, 90, 503.
- Royston, P. (2005). Multiple imputation of missing values: update. *Stata Journal*, 5, 188–201.
- Rutter, M., Yule, W., & Graham, P. (1973). Enuresis and behavioral deviance: Some epidemiological considerations. *Clin Dev Med*, 48/49, 137–147.
- Sawyer, G. S., Baghurst, P., & Mathias, J. (1992). Differences between informants reports describing emotional and behavioural problems in community and clinic-referred children: A research note. *Journal of Child Psychology and Psychiatry*, 33, 441–449.
- Stanger, C., & Lewis, M. (1993). Agreement among parents, teachers, and children on internalizing and externalizing behavior problems. *Journal of Clinical Child Psychology*, 22, 107–115.
- Steinhausen, H. C., & Gobel, D. (1989). Enuresis in child psychiatric clinic patients. *Journal of the American Academy of Child and Adolescent Psychiatry*, 28, 279–281.
- Theunis, M., Van Hoecke, E., Paesbrugge, S., Hoebeke, P., & Vande Walle, J. (2002). Self-image and performance in children with nocturnal enuresis. *European Urology*, 41, 660–667; discussion 667.
- van Buuren, S., Boshuizen, H. C., & Knook, D. L. (1999). Multiple imputation of missing blood pressure covariates in survival analysis. *Statistics in Medicine*, 18, 681–694.

Van Hoecke, E., Baeyens, D., Vande Walle, J., Hoebeke, P., & Roeyers, H. (2003). Socioeconomic status as a common factor underlying the association between enuresis and psychopathology. *Developmental and Behavioral Pediatrics, 24*, 109–114.

Van Hoecke, E., De Fruyt, F., De Clercq, B., Hoebeke, P., & Vande Walle, J. (2005). Internalizing and externalizing problem behavior in children with nocturnal and diurnal enuresis: A five-factor model perspective. *Journal of Pediatric Psychology, 31*, 460–468.

Van Hoecke, E., Hoebeke, P., Braet, C., & Walle, J. V. (2004). An assessment of internalizing problems in children with enuresis. *Journal of Urology, 171*, 2580–2583.

Von Gontard, A., Mauer-Mucke, K., Pluck, J., Berner, W., & Lehmkuhl, G. (1999). Clinical behavioral problems in day- and night-wetting children. *Paediatric Nephrology, 13*, 662–667.

Wagner, W. G., & Geffken, G. (1986). Enuretic children: how they view their wetting behaviour. *Child Study Journal, 16*, 13–19.

Wechsler, D. (1991). *Manual for the Wechsler intelligence scale for children* (3rd ed.), San Antonio, TX: Psychological Corporation.

Wille, S., & Anveden, I. (1995). Social and behavioral perspectives in enuretics, former enuretics and non-enuretic controls. *Acta Paediatrica, 84*, 37–40.

Woods, S., & Wolke, D. (2003). Does the content of anti-bullying policies inform us about the prevalence of direct and relational bullying behavior in primary schools? *Educational Psychology, 23*, 381–402.

Appendix I. Prevalence of child-reported problems and a description of the clinic-based measures used to derive them

Child-reported problem	Prevalence in ALSPAC study population	Description of clinic-based measures and examples of items
Overt bullying	9.1%	Bullying and Friendship Interview Schedule (BFIS, Woods, Wolke, 2003) Overt bully/victim (five questions) for example, has child hit/beaten up others/been hit/beaten up? Relational bully/victim (four questions) for example, has child spoilt other childrens' games/had games spoilt? If child responded "yes" to any bullying event he/she was classified as overt or relational bully/victim if bullying event happened frequently (several times a month) or very frequently (several times a week).
Relational bullying	2.6%	
Overt victim	34.1%	A reduced (12 item) version of Harter's SPPC (Harter, 1985) comprising global self-worth (items 2, 4, 6, 8, 10, and 12) for example, "some children are happy with themselves as a person" and scholastic competence subscales (items 1, 3, 5, 7, 9, and 11) for example, "some children do very well at their classwork". Child asked to respond "Yes, really like me"; "Sort of true for me"; "Yes, a bit like me"; "No, not really like me"; "No, not at all like me" Score range = 6–24; ≤ 14 = low score. Cronbach's α for the 12 items = .749.
Relational victim	15.8%	
Low scholastic competence	23.9%	A series of five questions taken from the Cambridge Hormones and Moods Project Friendship Questionnaire (Goodyer et al., 1990) for example, "Are you happy with the number of friends you've got?"; "How often do you see your friends outside of school?" Each item is on a 4-point likert scale—"very happy", "quite happy", "quite unhappy", "unhappy" or "don't know". Score range = 0–15; score of 0 denotes the most positive Friends score and 15 denotes the least positive score. Score of 6 or more = high score. Cronbach's α = .503.
Low global self-worth	20.3%	
Unhappy with friendships	18.0%	15 questions, including 11 from the Self-Reported Antisocial Behaviour for Young Children Questionnaire (Loeber et al., 1989), three dummy questions and an additional example question, for example, "Have you ever taken something from a shop without paying for it?"; "Have you ever tried a cigarette?" Child asked to respond "ever" or "never". The prevalence quoted is percentage of children who answered "ever" to one or more questions.
Antisocial activities	21.9%	

Appendix II. Prevalence in the study population of DSM-IV disorders, parent-reported psychological problems derived from the DAWBA (and a description of how they were derived)

DSM-IV diagnosis		Parent-reported psychological problems in current study		
Disorder derived from DAWBA	Prevalence in ALSPAC study population	Outcome variables derived from DAWBA	Derivation of dichotomous outcome variables from list of symptoms in DAWBA and examples of items in DAWBA relating to each outcome	Prevalence in ALSPAC study population
Separation anxiety	0.8%	Separation anxiety	Any separation anxiety symptom(s) “a lot more than others” compared with “no more than others” or “a little more than others” for example, has he/she worried about sleeping alone?	7.2%
Social phobia	0.3%	Social fears	Any social fears “a lot” compared with “none”, “a little”, or “hasn’t done this in the last month” for example, has he/she been afraid of meeting new people?	5.5%
Specific phobia	1.1%	Particular fears	Any particular fears “a great deal” compared with “quite a lot”, “only a little” or “not at all” for example, is he/she scared of the dark?	12.4%
Generalized anxiety disorder	0.5%	General anxiety	Any of the worries “often” compared with “sometimes” or “not at all” for example, does he/she worry a lot about schoolwork, homework or tests/examinations?	8.5%
Any depressive disorder	0.5%	Sadness/depression	Any mood symptoms compared with none for example, did he/she think about death a lot?	11.8%
Any ADHD disorder	2.1%	Attention and activity problems	Any attention/activity problems “a lot more than others” compared with “a little more than others” or “none” for example, does he/she often fidget? Is he/she easily distracted?	14.6%
Oppositional-defiant disorder	2.1%	Oppositional behavior	Any of the behaviors “a lot more than others” compared with “no more than others” or “a little more than others” for example, has he/she had severe temper tantrums?	6.2%
Conduct disorder	0.6%	Conduct problems	Any of the behaviors “definitely/often/more than once” compared with “none”, or “perhaps”/ “sometimes”/“once only” for example, has he/she bullied or threatened people?	6.6%