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ORIGINAL ARTICLE

The relationship between exclusion from school and mental health: a secondary analysis of the British Child and Adolescent Mental Health Surveys 2004 and 2007

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Background. Children with poor mental health often struggle at school. The relationship between childhood psychiatric disorder and exclusion from school has not been frequently studied, but both are associated with poor adult outcomes. We undertook a secondary analysis of the British Child and Adolescent Mental Health Surveys from 2004 and its follow-up in 2007 to explore the relationship between exclusion from school and psychopathology. We predicted poorer mental health among those excluded.

Method. Psychopathology was measured using the Strengths and Difficulties Questionnaire, while psychiatric disorder was assessed using the Development and Well-Being Assessment and applying Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM IV) criteria. Exclusion from school and socio-demographic characteristics were reported by parents. Multi-variable regression models were used to examine the impact of individual factors on exclusion from school or psychological distress.

Results. Exclusion from school was commoner among boys, secondary school pupils and those living in socio-economically deprived circumstances. Poor general health and learning disability among children and poor parental mental health were also associated with exclusion. There were consistently high levels of psychological distress among those who had experienced exclusion at baseline and follow-up.

Conclusions. We detected a bi-directional association between psychological distress and exclusion. Efforts to identify and support children who struggle with school may therefore prevent both future exclusion and future psychiatric disorder.

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Key words: Epidemiology, exclusion, psychiatric disorder, psychopathology, school.

Introduction

Exclusion from school is a disciplinary tool used around the world; in the UK, exclusions can be of either fixed period(s) of up to a total of 45 days per academic year, or a permanent expulsion that terminates the child's attendance at the excluding school. The effects and application of exclusion from school remain a contentious issue; previous research has suggested that it is associated with both internalising and externalising psychopathology, as well as poor occupational and academic outcomes (Parker *et al.* 2014; Whear *et al.* 2014; Obsuth *et al.* 2017).

According to the latest English government figures (Department for Education, 2016*a*), the number of permanent exclusions for 2014/15 was 5800 (0.07% of school population), and for fixed term, the number was 302 980 (3.88% of school population). The commonest reason for exclusion was persistent disruptive behaviour. Characteristics of pupils who appear to be over-represented in these statistics include boys, children with special educational needs, eligibility for free school meals (FSM), young people aged 14 plus and those from black and minority ethnic groups (BME; excluding Asian and Chinese).

Childhood psychiatric disorders are common (8–18% of the school age population), persistent, possibly increasingly prevalent and associated with several adverse outcomes including educational failure, adult mental illness, risk-taking behaviour and

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criminality (Kim-Cohen *et al.* 2003; Collishaw *et al.* 2004; Costello *et al.* 2005; Ford *et al.* 2017). Population-based studies demonstrate that when psychopathology is measured using a dimensional approach, there is a continuous spectrum of psychological functioning (Ford & Parker, 2016), although Goodman & Goodman (2011) reported a linear association between psychopathology scores and the likelihood of psychiatric disorder. These findings suggest that for every child who meets diagnostic criteria, there will be several others who are struggling. Poor childhood mental health is associated with disruptive behaviour (Vorhaus & Vorhaus, 2012) and poor academic attainment (Copeland *et al.* 2014) both of which may increase the likelihood that a child may be excluded. Previous research (Ford *et al.* 2004) reported that socio-economic deprivation, poor general health, family dysfunction, parental psychiatric illness, adverse life events and ethnicity were associated with an increased prevalence of psychiatric disorder. This suggests an overlap between the characteristics of children who are most likely to have a psychiatric disorder and those most likely to be excluded from school. In addition, most child mental health-related contacts with services occur within the education sector, and similar proportions of children with psychiatric disorder access specialist education professionals as attend child and adolescent mental health services with relatively few attending both (Ford *et al.* 2007). Two linked systematic reviews revealed a gap in the research literature, with very few studies that have explicitly explored the link between exclusion from school and psychopathology (Parker *et al.* 2014; Whear *et al.* 2014). Few studies have suggested that exclusion from school may be commoner among children with psychiatric disorder than their mentally healthier peers, while psychopathology is more prevalent and/or severe among children excluded from school as compared with those who are not excluded (Parker *et al.* 2014; Whear *et al.* 2014). Notably, none of the studies detected by these reviews were primarily focused on this topic.

With this in mind, we undertook a secondary analysis of the British Child and Adolescent Mental Health Survey (BCAMHS) 2004 (Green *et al.* 2005) and its 3-year follow-up (Parry-Langdon, 2008). We predicted that children with poor mental health (regardless of whether they met diagnostic criteria for psychiatric disorder) would be more likely to be excluded from school than their peers in both 2004 and 2007. Similarly, we hypothesised that children who had been excluded from school in 2004 would have poorer mental health in 2007 compared with those children who have not been excluded from school at baseline.

Methods

The original survey had approval from Medical Research Ethics Committees (MREC); the Peninsula College of Medicine and Dentistry granted approval for this secondary analysis.

Sampling strategy and response rates

A representative sample of children and young people aged 5–16 years living in private households in Great Britain was selected from a sampling frame for England, Wales and Scotland using the Child Benefits register (Green *et al.* 2005). Child Benefit was at that time a universal benefit payable to British parents for each child, with near 100% take up. Families were excluded if they did not have a valid postcode, lived in postal sectors that were deemed too small (<100 families; 0.25% of addresses) or were considered too sensitive to approach. Coverage of children aged 5–16 years was estimated to be 90%.

Four hundred and twenty-six postal sectors were sampled with a probability related to size of the sector, and stratified by regional health authority and social economic group. Figure 1 describes the recruitment process. Parents ($n = 12\,294$) were invited to take part in the study by letter from the Office for National Statistics. In both surveys, all parents were interviewed, as were children aged 11 and over; when the family agreed, a brief questionnaire was mailed to a teacher nominated by the family. The final sample size at baseline (2004) was 7977, which represented 65% of those approached. In the follow-up study in 2007, 73% of the 7329 parents who were contacted completed interviews; the final sample size at follow-up was 5326 (72% response rate).

Young people were aged between 7 and 19 years at follow-up, with 1704 aged 16 and over; of these 469 (28%) were reported to be in full time education in 2007.

Measures

Psychopathology was measured using the Strengths & Difficulties Questionnaire(SDQ) (Goodman, 2001, http://www.sdqinfo.org) and the Development and Well-Being Assessment (DAWBA) (Goodman *et al.* 2000) in both surveys.

All parents, teachers and children over 11 years were invited to complete the SDQ, which is a measure of common childhood psychopathology, validated across multiple populations (Goodman, 2001, http://www.sdqinfo.org). The SDQ comprises of 25 items that make up five sub-scales, which include emotional symptoms, conduct problems, hyperactivity/inattention, peer problems and pro-social behaviour. A total

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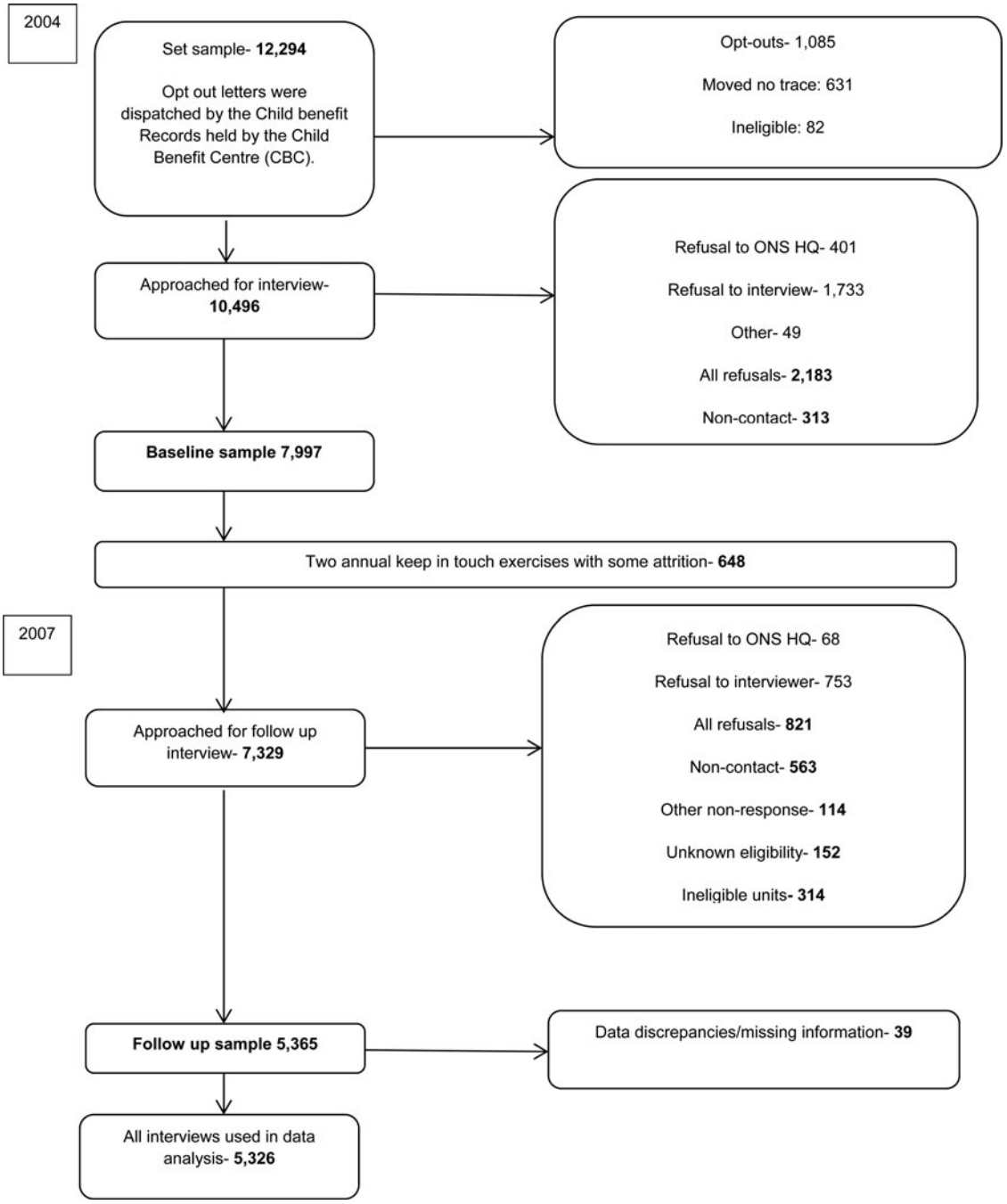

Fig. 1. Flow diagram of participant recruitment to the British Child Mental Health Survey in 2004, and its follow-up in 2007.

difficulties score is calculated by adding the sub-totals from the first four sub-scales. The SDQ impact supplement asks the informant whether they consider the child to have a significant mental health problem and if so how long any difficulties have been present, distress to the child, the impact for the child on their home life, friendships, classroom learning and leisure activities, and the burden on the informant. Questions for teachers exclude home life and leisure activities.

The DAWBA (Goodman *et al*. 2000) is a standardised diagnostic interview that combines both structured and semi-structured features; information is collected from parents, young people aged 11 or over and teachers. The structured questions relate to diagnostic criteria in Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) (American Psychiatric Association, 1994) and International Classification of Diseases, 10th Edition (ICD-10) (World Health Organisation, 1993), which are

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complemented by a series of open-ended questions where problems were identified. The quantitative and qualitative information from all available informants was reviewed by a small team of experienced child psychiatrists (including TF and RG) who assigned psychiatric diagnoses according to DSM-IV classification (American Psychiatric Association, 1994). Each rater worked independently with regular group discussion of complex and borderline cases. These were reviewed by the programme developer (RG) for consistency. The κ statistic for chance-corrected agreement between two clinicians who independently rated 500 children was 0.86 for any disorder (standard error S.E. 0.04), 0.57 for internalising disorders (S.E. 0.11) and 0.98 for externalising disorders (S.E. 0.02). The test–retest reliability of the DAWBA has not been ascertained as it is doubtful that you could obtain valid responses to such a detailed assessment over a short enough period of time to ensure that the child's symptoms had not changed. Having a small clinical team made it easier to maintain diagnostic consistency.

Exclusion from school

Both surveys asked parents 'Has [*Name Child*] ever been excluded from school' (Green *et al.* 2005; Parry-Langdon, 2008); the parent could respond 'yes' or 'no'. The 2007 survey asked a series of questions about the type, reason and length of exclusion and what educational provision the child received afterwards. As these details were not available for 2004 and there were so few permanent exclusions reported in 2007 (see Table 1), all reported exclusions were analysed together. Exclusion status was classified into four groups: no exclusion in either survey ($n = 3879$), exclusion in both surveys ($n = 54$), exclusion in 2004 only ($n = 19$) and exclusion in 2007 only ($n = 129$).

Background information

Demographic details, such as family type, ethnicity, parental educational qualifications and weekly household income, were obtained from the interview with parents. Housing tenure was grouped into whether families owned or rented their accommodation.

Neighbourhood environment was assessed using the ACORN (A Classification Of Residential Neighbourhoods; CACI Information Services, 1993). Parents rated their child's general health using a five-point Likert scale from very good (1) to very bad health (5), which was dichotomised by combining reports of very good and good health ($n = 7401$) or poor health (fair, bad and very bad; $n = 464$). Parent's mental health was measured using the 12-item General Health Questionnaire (GHQ, Goldberg & Williams, 1988) with a cut point of 3 or more to indicate distress (Green *et al.* 2005).

Table 1. *Summary of the descriptive statistics of those who had been excluded in 2007*

Variable	Excluded at 2007 ($n = 183$)
Number of times excluded from school[a]	
Once	86
Twice	36
Three or more	60
Type of exclusion (for the last reported exclusion if more than one)	
Fixed term (suspension)	160
Permanent exclusion	19
Not sure	4
Educational provision after exclusion[b]	
Move to another school	2
Home tutoring	8
Referral unit	10
Special school	5
None	155
Received any of the help listed below after the exclusion[c]	
Behaviour management training	17
Cognitive behavioural therapy	3
Parent management training	1
Family therapy	3
Received no extra help	113
Other	45

[a] One child was missing for this question.

[b] Three children were missing data for this question; the survey question did not specify in relation to which exclusion if more than one and parents could endorse one option.

[c] One child was missing for this question; the survey question did not specify in relation to which exclusion if more than one and parents could endorse one option.

A child was deemed to have a learning disability if one or both of the parents or teachers had estimated that the child's mental age was 60% of the chronological age or less (e.g. a mental age of 6 or less at a chronological age of 10) (Liddle *et al.* 2009). Teachers also provided information about the child's level of attainment in comparison to their peers. This was coded into a binary variable no learning disability or moderate/severe learning difficulty ($n = 7768$, 161 respectively).

Analysis

Descriptive statistics

Analysis was conducted using STATA 13.0 (StataCorp, 2013). Tests of association between categorical

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variables and exclusion status were conducted using χ^2 tests; with one-way analysis of variance for continuous variables. Trends in parental total difficulties SDQ scores both at baseline and follow-up were explored. Logically all the children with parents who reported exclusion in 2004 should have been reported to have had exclusions in 2007 as the question asked about 'ever', but as some parents only reported exclusion in 2004, these four groups were analysed separately at the bivariable level.

Adjusting for survey design and probability weights

Sampling weights adjusted for the probability of postal sector selection in the sampling frame and to compensate for differential response rates by region and strata at the time of the initial survey in the reported prevalence estimates. The remaining analyses were conducted on unweighted data because analyses of the initial BCAMHS showed very small design effects on most estimates (Heyman *et al.* 2001). Importantly, for an outcome that might cluster in families, only one child per family was selected.

Regression models

Unadjusted models were fitted to establish the impact of individual factors on the outcome of exclusion from school (logistic regression) or psychological distress measured by parental SDQ total difficulties score (linear regression). Multi-variable regression models controlled for relevant confounding factors suggested by the background literature (Hayden, 1997; Hayden & Dunne, 2001; Daniels *et al.* 2003; Hemphill *et al.* 2010; Parsons, 2010; Skiba *et al.* 2011). The expected probability of exclusion from school was calculated for baseline SDQ score on exclusion at follow-up, stratified by gender because of the over-representation of boys among children who are excluded, and adjusted for other detected independent predictors to avoid overestimating the influence of psychological distress. A backwards stepwise approach was adopted where non-significant variables were individually removed until all variables retained were significant, aside from gender, age and ethnicity. The potential confounding variables considered included baseline parental mental health, exclusion status at baseline, age, household occupation, neighbourhood deprivation, household income, ethnicity, parental general mental health, mother's highest educational qualification, general health of the child and general learning disability of the child. This analysis omitted children who were excluded only in 2004 (n = 19) and those excluded at both time points (n = 54) as we wanted to test the relationships of baseline mental health on future exclusion. Interactions were studied between gender and age. The comparison group was children who had not been excluded from school. The SDQ score and psychiatric diagnosis were not included as covariates when the other was the outcome due to collinearity.

Prospective models were based on new exclusions/diagnosis in 2007. The wording of the question parents were asked about their child's exclusion did not distinguish exclusions that predated 2004 (baseline) from those that had occurred between the surveys. Thus, children who were excluded only in 2004 or at both time points were omitted from these analyses. Equally those who had a disorder only in 2004 or at both time points were absent from these models.

Results

Prevalence of exclusion from school of the overall dataset

At baseline, 3.9% (n = 313) of the sample had been excluded; 75% were boys (n = 236) and most were aged 11–16 years (87.5%, n = 274). At follow-up, 4.5% (n = 183) reported exclusion, of which 70% (n = 129) were 'new' exclusions; over half of the children who had been excluded by 2007 had experienced more than one exclusion (Table 1), although permanent exclusions were uncommon (10% of those excluded). In addition, 14% had moved from the school that excluded them, whereas only a third reported that they received additional support after the exclusion.

Description of the sample according to exclusion status

In both surveys, the experience of exclusion was commoner among boys, secondary school pupils and those with socio-economic deprivation, but the expected relationship with BME was not detected (Table 2). Poor child general health and learning disability and poor parental mental health were also associated with exclusion at both time points.

Exclusion status and SDQ parental total difficulties

Figure 2 demonstrates consistently high levels of psychological distress among those who had experienced exclusions at both time points that exceeded the commonly quoted clinical cut point of 16 (http://www.sdqinfo.org). Mean parental SDQ scores were raised at the time that data were gathered among children with exclusions reported only once and the levels of psychological distress were consistently higher among children reported to have experienced exclusion at any time point compared with their non-excluded peers.

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Table 2. *Unadjusted characteristics of the sample at baseline in relation to exclusion status across both surveys*

	Exclusion at baseline (2004)			Exclusion at follow-up (2007)		
	n	OR (95% CI)	*p* value	*n*	OR (95% CI)	*p* value
Gender						
Female	3772	1.00		1960	1.00	
Male	4008	3.00 (2.31–3.90)	<0.001	2049	1.36 (1.10–1.62)	<0.001
Age						
5–10	3854	1.00		2664	1.00	
11–16	3926	7.34 (5.23–10.30)	<0.001	1345	3.26 (2.27–4.68)	<0.001
Ethnicity						
White	6869	1.00		3602	1.00	
Ethnic minority	907	0.74 (0.50–1.09)	0.128	403	1.00 (0.56–1.79)	0.995
Psychiatric disorder						
No	7037	1.00		3765	1.00	
Yes	743	13.68 (10.79–17.36)	<0.001	244	5.45 (3.55–8.35)	<0.001
Social class						
Higher	2115	1.00		1624	1.00	
Intermediate	1156	1.43 (0.87–2.36)	0.157	872	1.10 (0.71–1.50)	<0.001
Lower	1873	2.81 (1.90–4.17)	<0.001	1407	2.46 (2.12–2.80)	<0.001
Never worked	111	3.3 (1.36–8.01)	0.008	82	4.04 (2.99–5.09)	<0.001
Student/not stated	34	3.61 (0.83–15.64)	0.08	24	6.19 (4.84–7.55)	<0.001
Neighbourhood deprivation						
Wealthy achievers	1556	1.00		1168	1.00	
Urban prosperity	396	0.65 (0.25–1.69)	0.377	321	1.42 (0.59–3.44)	0.432
Comfortably off	1413	0.95 (0.56–1.62)	0.860	1070	1.59 (0.87–2.92)	0.134
Moderate means	793	2.21 (1.34–3.65)	0.002	590	2.24 (1.18–4.27)	0.01
Hard pressed	1089	3.18 (2.04–4.94)	<0.002	831	4.70 (2.75–8.06)	<0.001
Weekly income						
<£200	588	1.00		471	1.00	
£200–£399	1104	1.03 (0.64–1.64)	0.906	823	0.95 (0.58–1.55)	0.842
£400–£770	1803	0.49 (0.30–0.80)	0.004	1379	0.42 (0.25–0.70)	0.001
>£770	1421	0.27 (0.15–0.49)	<0.001	1085	0.17 (0.08–0.34)	<0.001
Parental mental health						
No distress	4133	1.00		3192	1.00	
Distress	1138	2.59 (1.87–3.58)	<0.001	806	1.62 (1.10–2.39) p0.015	0.01
Parental education						
None	1411	1.00		550	1.00	
Qualification	6350	0.31 (0.24–0.39)	<0.001	3446	0.42 (0.28–0.63)	<0.001
General health (child)						
Good	7341	1.00		3812	1.00	
Poor	439	1.83 (1.24–2.70)	0.002	197	2.25 (1.25–4.07)	0.007
Learning disability						
No	7341	1.00		3945	1.00	
Yes	439	1.90 (0.99–3.66)	0.05	60	4.86 (2.26–10.46)	<0.001

Mean SDQ total difficulties score at baseline was associated with exclusion from school in cross-sectional analysis [odds ratio (OR) 1.16, 95% confidence interval (CI) 1.14–1.18] and prospectively (OR 1.11, 95% CI 1.08–1.14) as illustrated by Table 3. A significant interaction was detected between the age and psychological distress in the cross-sectional analysis (but not longitudinally) with exclusion (adjusted OR = 0.93, 95% CI 0.88–0.97, $p = 0.002$). For every point increase in the SDQ, the odds of exclusion increased by 15% among those aged 11–15 years compared with 23% of those aged 5–10 years.

The probability of exclusion at follow-up (see Fig. 3) was based on an adjusted model presented in Table 3. This graph presents the predicted probability for boys (other variables coded as 0 to avoid overestimating the probability of exclusion by omitting the influence of other independent predictors) and suggests that the

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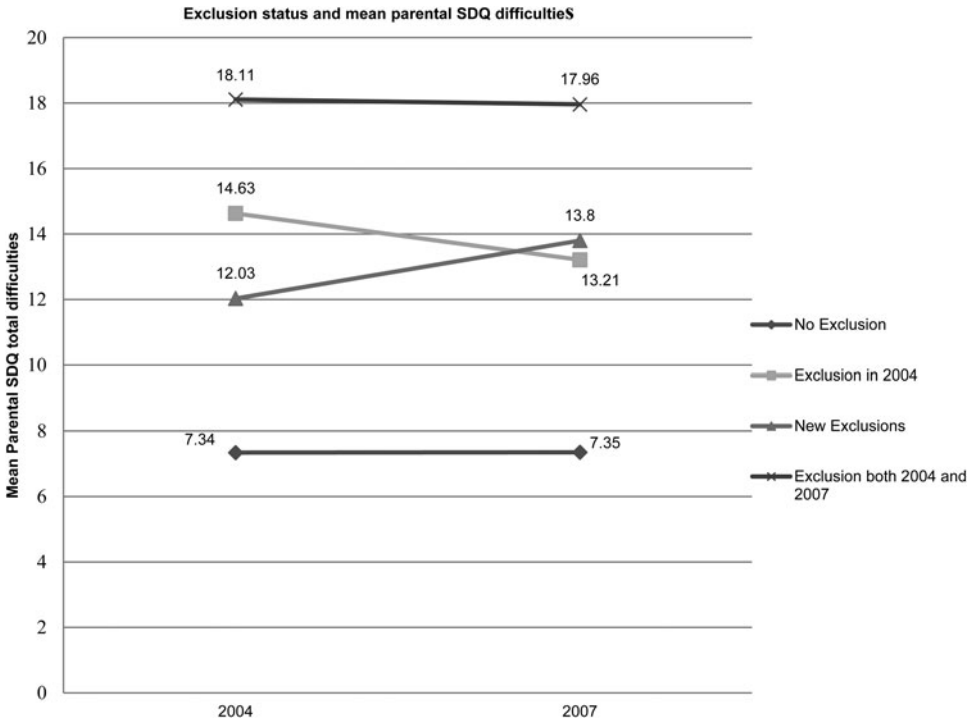

Fig. 2. Mean parental SDQ score by exclusion status in both surveys.

Table 3. *The impact of baseline characteristics on the child's likelihood to be excluded at follow-up*

Exposure	*N*	Adjusted OR (95% CI)	*p* value
Parental Strengths and Difficulties Questionnaire total difficulties score (2004)	4001	1.11 (1.08–1.14)	<0.001
Gender			
Female	1959	1.00	
Male	2042	2.65 (1.76–3.99)	<0.001
Age			
5–10	2660	1.00	
11–16	1341	3.81 (2.62–5.55)	<0.001
Ethnicity			
White	3600	1.00	
Ethnic minority	401	1.12 (0.61–2.05)	<0.607
Social class			
Higher	1622	1.00	
Intermediate	870	2.27 (1.24–4.16)	0.008
Lower	1407	3.46 (2.05–5.84)	<0.001
Never worked	80	3.00 (0.99–9.11)	0.05
Student/not stated	22	13.99 (4.05–48.33)	<0.001
Parental education			
None	559	1.00	
Qualification	3442	0.65 (0.42–1.00)	0.05

Neighbourhood, weekly income parents' mental health, child's general health and learning disability status were also tested in this model but were not significant and therefore removed.

likelihood of exclusion from school at follow-up accelerates from about a score of 20 on the SDQ. Data for girls were too sparse to present a similar graph.

Prospective unadjusted models showed that children excluded from school at baseline have significantly higher SDQ scores at follow-up [β coefficient 6.76 (5.85–7.66) $p < 0.001$], and higher odds of a new psychiatric disorder [OR 7.09 (5.07–9.91) $p < 0.001$], compared with children who had not been excluded from school in 2004. This association remained after controlling for potential confounders (Table 4).

Discussion

We found associations with psychopathology in BCAMHS 2004 and 2007 among children excluded from education. High levels of psychological distress were consistently detected among excluded children, while baseline psychopathology was a significant predictor of a child's likelihood of being excluded despite adjusting for common correlates of exclusion (Hayden, 1997; Hayden & Dunne, 2001; Daniels *et al.* 2003; Hemphill *et al.* 2010; Parsons, 2010; Skiba *et al.* 2011). Furthermore, the impact of psychopathology on the likelihood of being excluded was greater when experienced at a younger age. Exclusion from school was likewise associated with increased psychopathology. This bi-directional association suggests that remediation and support for children whose behaviour

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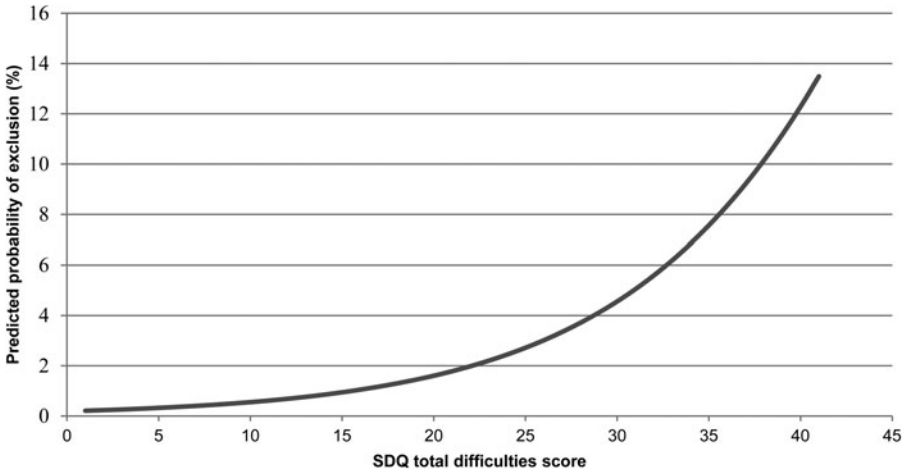

Fig. 3. Predicted probability of exclusion at follow-up from baseline parental SDQ total difficulties score among boys (based on adjusted analysis with other independent predictors coded to 0 to avoid over estimating the influence exclusion).

challenges school systems is important. Timely intervention may prevent exclusion from school as well as future psychopathology. The notion of early identification of difficulty for children who are struggling is acknowledged throughout literature and policy (Kim-Cohen *et al.* 2003; Taggart *et al.* 2006; Department for Education and Department of Health, 2014), while studies suggest that early intervention may have a beneficial impact (Beckett *et al.* 2010; Patton *et al.* 2014).

Boys, secondary school pupils, and children from a deprived socio-economic background, or with poor general health or learning disabilities were significantly more likely to be excluded at both time points. These factors correlate with government statistics for the same years, although we failed to detect significant association with BME status shown repeatedly in national statistics (Department for Children, Schools and Families, 2005, Department for Children, Schools and Families, 2009; Department for Education, 2013, 2016*a*). This may be due to the small numbers of children from ethnic minorities in the sample analysed. In addition, parental mental health disorders were also related to exclusions, which are less readily gauged from governmental statistics.

At baseline, 3.9% of the BCAMHS sample reported an exclusion compared with 4.7% of the national school population for the same period. This difference may be due to selection bias; the participation and drop-out rates in cohort studies of populations with psychiatric disorders is high, although the impact of drop-outs on the validity of regression models may be less than commonly believed, or indeed negligible (Wolke *et al.* 2009). In keeping with the contemporaneous national statistics, permanent exclusions in the 2007 follow-up were a rare event and most children in the sample remained at the school that excluded them. However, parents reported little support following the exclusion. This may be due to a failure of communication of reintegration strategies to parents and/or a lack of engagement by the child and parent with support that was offered, but suggests that there is considerable room for remediation that might reduce the number of children who experience multiple exclusions from school.

Few epidemiological studies have explored the impact of mental health on school exclusions. Those published have demonstrated associations between children with impairing psychopathology and exclusion from school, particularly among children with ADHD (Barkley *et al.* 1991; Rohde *et al.* 1999; Norwich, 2002; Bauermeister *et al.* 2007; Miller *et al.* 2012) and depression (Meyer *et al.* 1993; Rushton *et al.* 2002). Our findings reinforce the need for larger longitudinal studies to investigate these links in greater depth.

Given the established link between children's behaviour, classroom climate and teachers' mental health, burn out and self-efficacy, greater availability of timely support for children whose behaviour is challenging might improve teachers' productivity and school effectiveness (Aronsson *et al.* 2003; Maguire & O'Connell, 2007; Kidger *et al.* 2016). Current guidance from the Department for Education (2016*b*) focuses on authoritarian approaches to discipline and disruptive behaviour. In contrast, evidence-based programmes for conduct disorder emphasise the effectiveness of clear rules and instructions combined with promotion of positive behaviour through praise and encouragement (National Institute for Health & Care Excellence, 2013; Whear *et al.* 2013). In contrast, current policy guidance

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Table 4. *The impact of baseline exclusion status on the parent-reported Strengths and Difficulties Questionnaire total difficulty scores in 2007*

Exposure variables in 2004	*N*	Adjusted coefficient (95% CI)	*p* value
Exclusion 2004			
No	4712	0.00	
Yes	139	4.82 (3.90–5.73)	<0.001
Gender			
Female	2352	0.00	
Male	2499	−0.99 (−1.29 to −0.69)	<0.001
Age			
5–10	2505	0.00	
11–16	2346	−1.09 (−1.39 to −0.79)	<0.001
Ethnicity			
White	4429	0.00	
Ethnic minority	422	−0.61 (−1.16 to −0.07)	0.02
Social class			
Higher	2000	0.00	
Intermediate	1023	0.34 (−0.08 to 0.78)	0.114
Lower	1712	0.98 (0.57–1.40)	<0.001
Never worked	88	0.10 (−0.21 to 2.20)	0.106
Student/not stated	28	2.32 (0.32–4.32)	0.02
Neighbourhood deprivation			
Wealthy achievers	1464	0.00	
Urban prosperity	367	−0.27 (−0.88 to 0.35)	0.392
Comfortably off	1318	0.67 (−0.34 to 0.47)	0.744
Moderate means	703	1.00 (0.49–1.52)	<0.001
Hard pressed	999	1.11 (0.62–1.61)	<0.001
Weekly income			
<£200	578	0.00	
£200–£399	1078	−0.01 (−0.56 to 0.54)	0.970
£400–770	1802	−0.73 (−1.28 to −0.18)	0.009
>£770	1393	−1.47 (−2.09 to −0.86)	<0.001
Parent mental health			
No distress	3809	0.00	
Distress	1042	1.78 (1.41–2.15)	<0.001
Parental education			
None	689	0.00	
Qualification	4162	−0.76 (−1.22 to −0.30)	<0.001
General health (child)			
Good	4612	0.00	
Poor	230	2.52 (1.81–3.22)	<0.001
Learning disability			
No	4781	0.00	
Yes	70	4.90 (3.65–6.15)	<0.001

also specifically recommend exploring whether continuing disruptive behaviour is a sign of unmet needs, and a number of vulnerable children may face exclusion from school that might be avoided with suitable interventions (Donno *et al.* 2010; O'Regan, 2010). There is also an increasing focus on the promotion of mental health and well-being in schools (Department of Health, 2015; Department for Education, 2016*b*; House of Commons, 2017) with recommendations to improve communication between schools and child mental health services; schools are encouraged to undertake needs assessment, planned support and regular review with changes where necessary for pupils with poor mental health (Department for Education, 2016*b*). Early detection is a key theme, highlighting a need for teachers to have a low threshold to refer for specialist educational needs services. Specifically, the guidance refers to the use of the SDQ to aid detection and referral. This approach is potentially unethical if CAMHS or specialist educational needs services lack the capacity to respond and/or school budgets, are not allocated to support the recommendations made after specialist assessment. Previous work conducted by this team (Parker *et al.* 2016*a*) suggests that children whose poor mental health is recognised by parents and/or teachers are MORE likely to be excluded than those whose psychiatric disorder is not recognised. Early identification without adequate support will be insufficient.

Parents report that teachers are the most commonly contacted 'service' in relation to children's mental health (Ford *et al.* 2007; Newlove-Delgado *et al.* 2015). In the 1999 BCAMHS, similar numbers of families accessed mental health as did specialist education resources with little overlap between access to the two services (Ford *et al.* 2007). The additional mental health-related activities imposed substantial costs on schools (£799.2 million using 2008 prices) and specialist educational services (£508.8 million), which greatly exceeded those to other public sector services (£162.8 million for health and welfare combined; Snell *et al.* 2013). Marked inter-individual variation in costs suggests inefficiencies in the use of resources (Knapp *et al.* 2015). Anecdotally, these costs are mostly sunk in internal and/or multi-agency meetings rather than therapeutic activity; the diversion of professional time from meetings could potentially therefore improve outcomes without additional overall costs to the education system. While some economists would argue that the time involved for school staff is not an additional cost, it is certainly an opportunity cost as it diverts them away from alternative educational activity. Furthermore, characteristics other than the severity of psychological distress predicted service costs, and included some tractable issues, such as reading attainment and parental psychopathology (Knapp *et al.* 2015). Effective reading remediation or the active treatment of parental depression might also support

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the recovery of some children's mental health and may reduce the burden of mental health-related demands on the education system.

These analyses benefit from the large nationally representative sample, validated measures and prospective follow-up, but secondary analyses are constrained by the data available and the original questions asked. For example, the question to parents about types of exclusion and educational and other provision after exclusion did not specify which exclusion for children who experienced more than one, and while the options for educational provision are mutually exclusive, the options for mental health provision are not (see Table 1). As more than half reported multiple exclusions, the reports of no access to educational or mental health provision are even more striking. Similarly, we had no measure of eligibility or uptake of FSMs, although we did have access to multiple other socio-economic indicators. Exclusion from school results from a complex interaction of factors (Parsons, 2010; Parker *et al*. 2016*b*); including social, family and community issues in addition to mental health and learning. Adjustments in the models were made to account for some of these factors, but the direction of influence in relation to the impact of mental health on exclusion from school and the effect exclusion from school had on children's mental health are difficult to untangle. Data on the timing of exclusions and additional time points would have offered the potential to conduct a survival analysis, while data on the number of exclusions would have permitted a more nuanced descriptive analysis.

Not all parents consented to contact with schools, and not all teachers contacted responded; hence, our decision to use parent-reported psychopathology to allow more children to be included in the regression models, but this may not reflect the child's function in the classroom, which parents do not directly witness. Studies have shown relatively low inter-informant agreement about childhood psychopathology, which may have been present here (Achenbach *et al.* 1987; Collishaw *et al.* 2009). Ideally parent-reported exclusions would be supplemented with teacher and child reports or links to administrative data. Parents may under-report, given the stigma surrounding exclusion from school, but this may be balanced by reporting of unofficial/illegal exclusions that would not be included in official statistics (Children's Commissioner, 2013). Indeed, as 19 children were reported to be excluded 'only' in 2004 when the question at both time points asked if a child had EVER been excluded demonstrates this, although these children did have lower levels of psychopathology reported by their parents at follow-up than those whose parents reported exclusions at both time points.

In summary, we detected evidence of an independent bi-directional association between child mental health and exclusion from school that suggests that prompt assessment and suitable support for children whose behaviour challenges their school placement may both avert some exclusions and improve the child's mental health.

Key points

- Exclusion from school is a common disciplinary procedure, and although there is a suggested link between childhood psychopathology and exclusion, there is a lack of research focussed on this topic.
- Our study shows a bi-directional relationship between exclusion from school and psychopathology in children seen in a large population-based survey of childhood mental health in Great Britain and its follow-up 3 years later.
- Prompt identification and intervention to support children suffering psychological distress and demonstrating challenging behaviour may avert exclusions and improve their future mental health.
- Given the lack of large-scale longitudinal studies into exclusion and childhood mental health, our research reinforces the need for more in-depth studies addressing these issues and testing the effectiveness/cost-effectiveness of intervention.

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Declaration of Interest

Robert Goodman is the owner of Youthinmind Limited, which provides no-cost and low-cost websites related to the DAWBA and SDQ.

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