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Stressful events in early childhood and developmental trajectories of bedwetting at school age

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ABSTRACT

Objective: To examine whether early stressful events are associated with developmental trajectories of bedwetting.

Methods: This is a prospective cohort study comprising 8,761 participants from the Avon Longitudinal Study of Parents and Children (ALSPAC). Stressful events were measured using a maternal questionnaire completed at 3 time-points before their child was age 4. The association between stressful events and trajectories of bedwetting from 4–9 years was examined using multinomial regression.

Results: The association with stressful events was strongest for the frequent persistent bedwetting trajectory (wetting at least twice a week up to age 9). A 1-SD increase in the stressful events score was associated with a 29% (13% - 47%) increase in the odds of experiencing frequent persistent bedwetting compared with normal attainment of nighttime bladder control.

Conclusions: Clinicians and parents should be aware that continence is a developmental outcome that is associated with high levels of stress in the family.

Keywords: Bedwetting, nocturnal enuresis, latent class, developmental trajectory, stressful life events, ALSPAC.

INTRODUCTION

Nocturnal enuresis (bedwetting) is a common childhood disorder and the risk is higher in boys than girls (Fergusson et al. 1986). The aetiology of bedwetting is believed to be multifactorial, involving genetic (von Gontard et al. 2001), neurobiological (Jarvelin, 1989) and psychological risk factors (Joinson et al. 2015). It has also been suggested that environmental factors including stressors in early childhood could play an important role in the aetiology of bedwetting (Douglas, 1973). Stressors that have been examined in earlier studies include acute life events (e.g. death of parent), chronic stressors (e.g. family financial problems), normative events (e.g. birth of a sibling) and non-normative (unpredictable) stressors (e.g. parent's serious injury). Exposure to early stressful events has been found to be associated with an increased risk of bedwetting in a small case control study of seven-year olds (Jarvelin et al. 1990), a small longitudinal study of children followed up to age 8 (Kaffman et al. 1977) and a cross sectional study of 6 – 16 year olds (Kalo & Bella, 2010). Only one early prospective cohort study has examined the effects of stressful events on risk for subsequent bedwetting (Douglas, 1973). The study found that children who were exposed to 'disturbing' events (e.g. family breakdown, moving house, accidents, separation from mother) in the first four years of life (especially at age 3 – 4) had an increased prevalence of bedwetting up to age 15. Children exposed to four or more disturbing events had around double the risk of experiencing bedwetting than those not exposed to such events (Douglas, 1973).

A limitation of earlier studies is that they examined only the presence or absence of bedwetting and did not take into account the heterogeneity in development of continence during childhood. There is now evidence for distinct patterns (longitudinal phenotypes) of development of nighttime bladder control during childhood that are characterized by either normative development, delayed attainment, persistent bedwetting or relapses (Croudace et

al. 2003; Joinson et al. 2009; Sullivan et al. 2015). No studies have examined whether these different patterns of incontinence in childhood are differentially associated with early stressful events. Another limitation of earlier studies is the lack of adjustment for a range of potential confounders that might explain the association between stressful events and bedwetting.

We use data from a large UK cohort to examine whether stressful events in early childhood are associated with bedwetting at school age. Different patterns (latent classes) of typical and atypical development of nighttime bladder control have been previously identified using longitudinal data derived from parental reports of frequency of bedwetting at ages 4 – 9 years in almost 11,000 children from the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort (Sullivan et al, 2015). In this paper, we use these latent classes to examine whether exposure to stressful events in the first four years of life is associated with an increased risk of bedwetting at 4 – 9 years.

METHODS

Participants

The sample comprised participants from the Avon Longitudinal Study of Parents and Children. Detailed information about ALSPAC is available on the study website (http://www.bristol.ac.uk/alspac), which includes a fully searchable dictionary of available data (http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary). Pregnant women resident in the former Avon Health Authority in south-west England, having an estimated date of delivery between 1/4/91 and 31/12/92 were invited to take part, resulting in a cohort of 14,541 pregnancies and 13,973 singletons/twins (7,217 boys and 6,756 girls) alive at 12 months (Boyd et al. 2013). Ethical approval for the study was obtained from the ALSPAC

Law and Ethics committee and local research ethics committees. Written informed consent was obtained after the procedure(s) had been fully explained.

Exposure: stressful events in early childhood

Stressful events were measured using a maternally reported questionnaire comprising 42 life events (see Appendix) that was derived for ALSPAC using previous inventories as a basis for item selection (Brown and Harris, 1978; Barnett et al., 1983). Mothers completed the questionnaire at three time points when the study children were approximately 1 year 9 months, 2 years 9 months and 3 years 11 months. At the first time point mothers were asked "Have any of these (*life events*) occurred since the baby was 8 months old?" at the second time point: "Have any of these occurred since the study child was 18 months old?" and at the third time point: "Have any of these occurred since the study child was 2 ½ years old?". This allowed us to examine exposure to stressful life events in three time periods: 8 months to approximately 1 year 9 months; 18 months to approximately 2 years 9 months and 2½ years to approximately 3 years 11 months.

Outcome: Latent classes of bedwetting

At ages $4^1/_2$, $5^1/_2$, $6^1/_2$, $7^1/_2$ & $9^1/_2$ years (hereafter referred to as 4 – 9 years) parents were asked "How often usually does your child wet the bed?" and were given the options 'never'; 'less than once a week'; 'about once a week'; '2-5 times a week'; 'nearly every night'; 'more than once a night'. Latent classes of bedwetting were previously derived by collapsing the bedwetting frequency data at each time point into three-level ordinal variables indicating no current bedwetting, infrequent bedwetting (<than once a week or about once a week) and frequent bedwetting (2 – 5 times a week, nearly every night or more than once a night). The latter category corresponds to the frequency of bedwetting required for a DSM-V

diagnosis of nocturnal enuresis. Full details of the derivation of the latent classes are in (Sullivan et al. 2015).

The latent classes describe typical and atypical development of nighttime bladder control: '*normative development*' (71.5% of the sample) – low probability of bedwetting at any time point; '*infrequent delayed*' (14.3%) – delayed attainment of nighttime bladder control and decreasing probability of infrequent bedwetting from 4 – 9 years; '*infrequent persistent*' (8.6%) – relatively high probability of infrequent bedwetting from 4 – 9 years; '*frequent delayed'* (2.4%) – high probability of frequent bedwetting at age 4 years, which decreased and became more infrequent at 6 – 9 years; '*frequent persistent*' (3.2%) – relatively high probability of bedwetting at least twice a week from 4 – 9 years.

Potential confounders

We adjusted for potential confounders that are reported in the empirical literature to be risk factors for stressful life events and bedwetting. These included a range of socio-demographic measures and maternal depression. The socio-demographic measures were derived from responses to a questionnaire, completed by mothers during the antenatal period, containing items on socioeconomic position and adversity. Binary variables were generated from these questions and each item was scored as 1 if an adversity was present and 0 if not. The items included social class based on the lower of the mother or partner's occupational social class using the 1991 British Office of Population and Census Statistics (OPCS) classification and dichotomized into non-manual (professional, managerial or skilled professions) and manual (partly or unskilled occupations); early parenthood (< 19 years versus >=19 years), housing adequacy (yes/no - comprising crowding, periods of homelessness, living conditions, major defects/infestation), maternal education (defined as none versus high school qualifications or greater), major financial difficulties (yes/no), family

size (<3 children versus >=3 children) and the presence of a social network (yes/no – comprising emotional support, practical/financial support). We adjusted for maternal depression using the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al. 1987), which was completed by mothers when their study child was 8 months old. The EPDS was dichotomized at the standard cut-off (score>12) used to indicate probable depressive disorder (Evans et al. 2001).

We also adjusted for gender and a maternal rating of the child's developmental level at 18 months, which was assessed using a questionnaire developed by ALSPAC including items from the Denver Developmental Screening Test (Frankenberg et al. 1992). The questionnaire assesses four domains of development (fine motor, gross motor, communication and social skills) and scores on each domain were adjusted for age in weeks, standardized (using a linear regression model and extracting the residuals) and reversed where appropriate so that high values on all scores reflected a lower level of development. We used a total development score derived from the sum of the scores on each domain.

Statistical modelling

We generated a total life events score for each time period by adding all events (presence of life event =1, absence = 0) and then standardized the score to allow us to interpret the change in odds of membership to the bedwetting latent classes per standard deviation (SD) increase in life events score. We estimated the association between stressful events and membership of the bedwetting latent classes using a series of univariable multinomial logistic regression models and employing the normative latent class as the reference category. Models were then adjusted for the confounders described above. Parameter estimates were obtained using the "Modal ML" 3-step method (Vermunt, 2010) implemented in Mplus. This has been shown to produce less-biased estimates than traditional

three-step methods such as probability weighting, whilst avoiding the problem of covariates impacting on the measurement model itself (Asparouhov & Muthen, 2013). Bias-adjusted estimates were obtained using the Mplus "auxiliary (r3step)" command.

RESULTS

Bedwetting data were available for 10,810 children on at least one measurement occasion. Of these, 8,761 had data from at least three time-points and 5,849 had complete data. The proportion of children with bedwetting decreased over time and proportions did not change markedly when the sample was restricted to participants with more data – see (Sullivan et al. 2015). For the analyses presented here, we focused on the sample with bedwetting data available from at least three time points (n=8,761). Conclusions were consistent for the other two samples described earlier (available on request). Whilst the sample with complete bedwetting data had the lowest rates of socioeconomic disadvantage, there was little variation in the other confounders and the risk factors across samples (Table 1).

Association between stressful events and bedwetting latent classes

Table 2 presents the results of the analysis examining the associations between stressful events experienced in three time periods and latent class membership. Odds ratios were derived in relation to the normative latent class of nighttime bladder control, which was used as the reference category in this analysis. The results show the increase in odds of membership to each latent class per one standard deviation (SD) increase in the stressful events score. There was evidence that stressful events occurring in the first two time periods were associated with membership of the infrequent delayed, infrequent persistent and

frequent persistent classes, but not the frequent delayed class. For instance, in the unadjusted model a one SD increase in the stressful events score for the first time period was associated with a 29% (13% - 47%) increase in the odds of belonging to the frequent persistent class compared with the normative class. Adjustment for confounders led to a small attenuation of these effects, but there was still evidence that stressful events were associated with increased odds of membership to these classes. Odds ratios were generally highest for the frequent persistent class in the adjusted models e.g. a one SD increase in the stressful events score for the first time period was associated with a 27% (10% - 47%) increase in the odds of belonging to the frequent persistent class compared with the normative class in the adjusted model. Stressful events at the latest time period were only associated with increased odds of membership to the frequent persistent class. For example, a one SD increase in the stressful events score was associated with a 30% (11% - 52%) increase in the odds of belonging to the frequent persistent class compared with the normative class.

DISCUSSION

Most children are expected to attain nighttime bladder control by 4 – 6 years (Fergusson et al. 1986). We find evidence that the risk of experiencing problems attaining bladder control at 4 – 9 years is greater if the child is exposed to stressful events in early childhood. These results are consistent with previous studies reporting a link between early stressful events and bedwetting (Douglas, 1973; Jarvelin et al. 1990; Kaffman & Elizur, 1977; Kalo & Bella, 1996). This, however, is the first prospective study to examine whether early stress is associated with distinct patterns of atypical development of nighttime bladder control. Our findings were mostly in agreement with a dose response relationship, in which increasing levels of exposure to early stress were associated with increasing severity (frequency and persistence) of bedwetting. We did not find evidence for distinct etiologies

for the latent classes. It is possible that distinct risk factors would emerge if we further refined our bedwetting classes by incorporating additional symptom information such as concurrent daytime wetting and indicators of bladder dysfunction.

Strengths and limitations

The study is based on a large contemporary cohort and takes advantage of repeated measures of frequency of bedwetting and the availability of a range of confounders. We have extended previous work by using developmental trajectories of frequency of bedwetting throughout childhood as our outcomes rather than simply the presence or absence of bedwetting at a particular age.

We did not examine the effect of specific life events, nor did we distinguish between life events that are acute (e.g. death of parent) versus more chronic in nature (e.g. financial problems) or between normative stressors (e.g. marriage, pregnancy) and non-normative (unpredictable) stressors (e.g. accidents). Some studies have found evidence that single events, especially parental divorce or separation, are particularly important risk factors for enuresis (Jarvelin et al. 1990; Kaffman & Elizur, 1977). We additionally examined single stressful events (e.g. divorce and separation), but we did not find individual associations with bedwetting (available on request). It is difficult to isolate the effect of single stressful events because they are often interrelated (e.g. parental divorce/separation may be related to financial problems). Consistent with the early prospective study (Douglas, 1973), we find that it is the total burden of exposure to stressful events during early childhood, rather than any single event, that is important in determining risk for subsequent bedwetting.

In agreement with earlier studies examining stressful life events, we generated a total life events score for each time period by adding all events (e.g. Araya et al. 2009). This differs to the approach taken by Jarvelin et al (1990), who weighted the life events according

to the parents' perceived "seriousness" of the event. There is evidence that appraisals of the negative impact of life events are systematically elevated in individuals with depression (Espejo et al. 2012). A mother's own subjective appraisal of the impact of a life event may not reflect the child's own experience of the impact.

In this paper, we focused on exposure to stressful life events in early childhood and we did not examine the effects of more proximal stressors on risk for bedwetting. There is evidence that proximal exposure to stressful life events increases the risk of secondary enuresis (relapse in bedwetting after a period of at least six months dryness) (Fergusson et al. 1990; Jarvelin et al. 1990). There is also a possibility that the association between stress and bedwetting is bidirectional. The occurrence of bedwetting after the age at which most children would be expected to be dry at night can often lead to increased levels of stress in the family. Intolerance and punishment are not uncommon among parents of children with incontinence (Butler & McKenna, 2002) and such reactions could increase stress in the child, resulting in further episodes of bedwetting.

Potential mechanisms explaining the link between stressful events and bedwetting

Bedwetting is conceptualized as a 'biobehavioral' problem (Houts, 1991) with biological, behavioral and psychosocial factors contributing to the etiology. The age of 2 – 4 years is believed to be a sensitive period for learning bladder control (Douglas, 1973; Jarvelin et al. 1990, MacKeith, 1968). It is possible that parents experiencing high levels of stress may have less time and sensitivity to cope with the demands of toilet training (Jarvelin et al. 1990) and this could adversely affect their child's transition to continence. There is evidence that delayed or inadequate toilet training is associated with an increased risk of bladder dysfunction (e.g. urgency, urge incontinence, emptying difficulties, bladder instability and/or dyscoordinated micturition) (Hellstrom, 2000; Bakker & Wyndaele, 2000; Hodges et al.

2014). Bladder dysfunction is not only a contributing factor for daytime wetting, but it is also associated with bedwetting (Franco et al. 2013; Neveus et al. 2000). There is also evidence that the stress hormone cortisol suppresses the release of ADH (Bahr et al. 2006), a lack of which leads to polyuria (increased volume of urine in the bladder) (Aikawa, Kasahara, Uchiyama, 1998).

It is notable that higher levels of stressful events at the latest time point (up to around age 4) were associated with the frequent persistent class, but not the infrequent bedwetting classes. There is evidence that during the period of transition to bladder control, the risk of developing continence problems may be greater if the transition period is prolonged and if the child is older (Hellstrom, 2000). Later initiation of toilet training could prolong the child's exposure to potential stressors and this could interfere with the process of learning bladder control. We examined whether toilet training was initiated later (after 24 months) among children in the frequent persistent class compared with the infrequent bedwetting classes. The proportions with later initiation of toilet training were 42.2% in the frequent persistent class compared with 36.8% in the infrequent delayed class and 41.2% in the infrequent persistent class. To properly examine this we would need to further refine the late initiation group to identify those with toilet training initiated after 2 ½ years, after 3 years and beyond, but the data did not permit this.

There was a relative lack of evidence for associations between the risk factors and the frequent delayed class. This might be due to this being the smallest class, leading to larger standard errors and hence, a lack of precision in our estimates of the effect of the risk factors on membership to this class. Alternatively, it is possible that this pattern of wetting has a slightly different aetiology. Three central nervous systems factors are believed to contribute to the development of enuresis: nocturnal polyuria (production of abnormally large amounts of urine at night), a lack of arousal and a lack of inhibition of the emptying reflex of the

bladder during sleep (von Gontard & Neveus, 2006). Overall, bedwetting has a spontaneous remission rate of approximately 15% per year (Forsythe and Redmond, 1974). In the delayed classes, this rate is lower, i.e. children take a longer time to achieve continence. It could be speculated that this is a less severe condition (characterized by a maturational delay) in contrast to the persistent classes (characterized by a maturational disorder). With increasing maturational development, children in the frequent delayed class would be expected to progressively attain improved bladder stability, increased central nervous system (CNS) recognition of bladder fullness and the ability to suppress bladder contractions (Watanabe et al. 1989). Children are more easily to arouse with increasing maturity (Busby, 1994) and lack of arousal is one of the possible pathophysiological aspects of nocturnal enuresis (Koff, 1996; Wolfish et al., 1997). From a clinical perspective, this developmental delay would be expected to resolve over time and these children would eventually attain nighttime continence, albeit at a later age than their typically developing peers.

It is possible that the effects of stressors could be mediated through comorbid behavioural and emotional problems. Although some earlier studies (many based on small samples) find no increased rates of psychological problems in children who wet the bed, there is now a wide and growing literature providing evidence that children with bedwetting have higher levels of both internalizing (e.g. depression and anxiety), as well as externalizing symptoms (e.g. attention/activity and conduct problems) (Joinson et al., 2007). Stressors not only increase the risk for relapses in bedwetting (see von Gontard et al, 2011a for a review), but also the risk of psychological disorders in children (Harland et al. 2002). These, in turn, could be responsible for the persistence of enuresis. A review paper cites evidence linking psychological distress to bladder dysfunction (Cortes et al. 2012). The authors suggest that this link may be due to alterations in neurotransmitters having direct or indirect effects on bladder function.

Gene-environment interactions also need to be considered. Previous analyses of the ALSPAC cohort have demonstrated that the risk for bedwetting is significantly increased if parents were also affected by enuresis (von Gontard et al., 2011b). With a heritability of 0.7, bedwetting is a highly genetically determined disorder (von Gontard et al., 2001). This genetic risk is present in all types of enuresis and can be modulated and activated by stressors (von Gontard et al., 2001).

Conclusions

There is well-established evidence that early exposure to stress interferes with brain development and is associated with a range of adverse developmental and health outcomes (Shonkoff & Garner, 2012). Our findings add to the evidence that continence is a developmental outcome that is associated with exposure to high levels of stress in the family. Family stress has also been found to be an important prognostic factor in the treatment of enuresis among children referred to a community based enuresis clinic (Devlin & O'Cathain, 1990). Health practitioners have a role to play in identifying families experiencing high levels of stress and directing them to appropriate sources of support. There is a need to educate parents about the long-term consequences of stress and the potential benefits of preventing or reducing sources of stress in early childhood (Garner et al. 2011). Families at high risk of stress should be offered anticipatory guidance, especially for sensitive developmental transition periods such as toilet training, because they may find the demands even more challenging. Provision of support to families under stress could help parents navigate sensitive transitions in child development and promote healthy development during the early years.

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Table 1: Means and proportions of risk factors and confounders in the three samples considered for the analysis

	Complete data (n=5489)	Partially missing data (n=8761)	At least one bedwetting measure (n=10,810)
Mean (SD) for stressful events score in each time period			
8 months to ~1 year 9 months	4.40 (2.81)	4.45 (2.87)	4.48 (2.93)
18 months to ~ 2 years 9 months	4.87 (2.97)	4.92 (3.03)	4.96 (3.10)
2½ years to ~ 3 years 11 months	4.56 (3.10)	4.61 (3.16)	4.66 (3.22)
Confounders			
Gender (male)	2959 (50.6%)	4508 (51.46%)	5580 (51.6%)
Maturational level (mean total score at 18 months)	37.72 (5.5)	37.73 (5.6)	37.74 (5.7)
Socioeconomic variables			
Manual social class	705 (12.8%)	1238 (15.4%)	1661 (17.3%)
Early parenthood <20 years	213 (3.64%)	419 (4.8%)	648 (6.0%)

Housing inadequacy	408 (7.1%)	748 (8.6%)	982 (9.3%)
Low maternal education	580 (10.0%)	995 (11.6%)	1342 (12.9%)
Financial difficulties	803 (13.9%)	1297 (15.1%)	1653 (16.0%)
Family size>=3	251 (4.3%)	424 (4.9%)	600 (5.8%)
Poor social network	716 (12.3%)	1129 (13.0%)	1433 (13.6%)
Maternal depression (mean EPDS score at 8 months)	3.18 (2.89)	3.27 (2.95)	3.31 (2.99)

Actual number with available data on each risk factor varies in each of the samples shown here.

Manual social class includes manual and part/unskilled.

Table 2. Odds ratios and 95% confidence intervals for the association between stressful events and latent class membership.

		N	Class			
			Infrequent delayed	Infrequent persistent	Frequent delayed	Frequent persistent
Stressful events						
8 months to ~1 year 9 months	Unadjusted	8193	1.14 (1.04, 1.26) p=0.008	1.21 (1.10, 1.32) p<0.001	0.99 (0.81, 1.20) p=0.911	1.29 (1.13, 1.47) p<0.001
	Adjusted 1: Gender, developmental level	7827	1.15 (1.04, 1.28) p=0.006	1.21 (1.10, 1.33) p<0.001	0.99 (0.81, 1.20) p=0.923	1.30 (1.14, 1.49) p<0.001
	Adjusted 2: Socio-demographic	7266	1.14 (1.02, 1.28) p=0.017	1.18 (1.07, 1.31) p=0.001	0.98 (0.79, 1.21) p=0.815	1.31 (1.14, 1.50) p<0.001

	factors					
	Adjusted 3: Maternal depression	7025	1.12 (1.00, 1.25) p=0.042	1.16 (1.04, 1.30) p=0.007	0.96 (0.77, 1.18) p=0.689	1.27 (1.10, 1.47) p=0.001
18 months to ~ 2 years 9 months	Unadjusted	7635	1.17 (1.07, 1.28) p=0.001	1.18 (1.08, 1.30) p<0.001	0.97 (0.79, 1.18) p=0.732	1.19 (1.02, 1.38) p=0.032
	Adjusted 1: Gender, developmental level	7266	1.17 (1.06, 1.29) p=0.002	1.21 (1.09, 1.33) p<0.001	0.97 (0.79, 1.19) p=0.784	1.20 (1.03, 1..40) p=0.019
	Adjusted 2: Socio-	6735	1.18 (1.06, 1.31) p=0.002	1.21 (1.09, 1.34) p<0.001	1.00 (0.80, 1.25) p=0.998	1.22 (1.04, 1.43) p=0.012

	demographic factors					
	Adjusted 3: Maternal depression	6519	1.17 (1.05, 1.30) p=0.004	1.20 (1.08, 1.33) p=0.001	0.98 (0.79, 1.21) p=0.819	1.21 (1.03, 1.42) p=0.024
2½ years to ~ 3 years 11 months	Unadjusted	8196	1.08 (0.98, 1.18) p=0.111	1.10 (1.00, 1.21) p=0.049	0.84 (0.69, 1.03) p=0.089	1.25 (1.10, 1.43) p=0.001
	Adjusted 1: Gender, developmental level	7749	1.09 (0.99, 1.20) p=0.067	1.12 (1.01, 1.24) p=0.028	0.88 (0.72, 1.08) p=0.223	1.29 (0.99, 1.67) p<0.001
	Adjusted 2:	7138	1.12 (1.01, 1.24)	1.10 (0.99, 1.22)	0.87 (0.70, 1.08)	1.33 (1.14, 1.54)

	Socio-demographic factors		p=0.033	p=0.069	p=0.193	p<0.001
	Adjusted 3: Maternal depression	6900	1.10 (0.99, 1.22) p=0.083	1.08 (0.97, 1.20) p=0.169	0.85 (0.69, 1.06) p=0.153	1.30 (1.11, 1.52) p=0.001

Adjusted 1: Gender, developmental level at 18 months (total development score derived from the sum of the scores on each domain).

Adjusted 2: Social class (manual versus non-manual), early parenthood (< 19 years versus >=19 years), housing adequacy (yes/no) maternal education (none versus high school qualifications or greater), major financial difficulties (yes/no), family size (<3 children versus >=3 children), presence of a social network (yes/no).

Adjusted 3: Maternal depression - Edinburgh Postnatal Depression Scale score at 8 months.

Appendix: Life events questionnaire items and the percentage of the ALSPAC cohort reporting these events at each time point

Listed below are a number of events that may have brought changes in your life. Have any of these occurred since the baby was 8 months old? (questionnaire administered at 21 months) / since the study child was 18 months old? (questionnaire administered at 33 months) / since the study child was 2 ½ years old? (questionnaire administered at 47 months)

	21 months	33 months	47 months		21 months	33 months	47 months
Your partner died	0.1%	0.1%	0.2%	You returned to work	14.4%	13.7%	17.3%
One of your children died	0.3%	0.4%	0.4%	Your partner went away	10.5%	12.0%	13.1%
A friend or relative died	23.4%	28.1%	28.5%	Your income was reduced	27.8%	29.3%	24.9%
One of your children was ill	39.3%	37.4%	34.7%	You had a major financial problem	14.9%	15.4%	12.5%
Your partner was ill	20.3%	19.8%	18.5%	You argued with your partner	62.0%	62.7%	54.6%
A friend or relative was ill	27.6%	28.3%	25.7%	Partner was physically cruel to you	2.8%	3.4%	3.3%
You were admitted to hospital	13.6%	22.2%	18.6%	Partner was emotionally cruel to you	9.4%	11.5%	8.5%
You were very ill	8.3%	8.6%	8.2%	Partner physically cruel to your children	0.3%	0.5%	0.5%
You were in trouble with the law	0.7%	0.7%	0.6%	You were physically cruel to your children	0.6%	0.7%	0.7%

Your partner was in trouble with the law	1.7%	1.9%	1.8%	Partner was emotionally cruel to your children	1.7%	2.5%	2.1%
You were convicted of an offence	0.4%	0.4%	0.4%	You were emotionally cruel to your children	1.5%	2.3%	1.7%
You were divorced	1.2%	2.0%	2.5%	You argued with your family and friends	18.0%	19.1%	17.3%
You and your partner separated	5.4%	7.1%	7.0%	You moved house	16.7%	19.8%	19.6%
Your partner didn't want your child	1.2%	1.1%	0.9%	Your house or car was burgled	14.3%	14.6%	13.0%
Your partner lost his job	7.8%	8.1%	7.6%	You became homeless	1.0%	1.0%	0.8%
Your partner started a new job	13.4%	15.7%	16.8%	You had an accident	2.7%	3.5%	4.0%
Your partner had problems at work	24.0%	25.4%	21.8%	You got married	2.2%	2.1%	2.1%
You had problems at work	11.2%	11.9%	11.9%	You became pregnant	23.0%	31.6%	25.6%
You lost your job	2.8%	3.0%	3.4%	You had a miscarriage	3.6%	5.5%	5.0%
You started a new job	14.6%	16.2%	21.3%	You had an abortion	1.0%	1.4%	1.7%
You took an examination	5.1%	7.2%	8.4%	You attempted suicide	0.3%	0.5%	0.5%