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Age variation in life events and their relationship with common mental disorders in a national survey population

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■ **Abstract** *Background* Life events (LEs) are recognised to be important risk factors for common mental disorders (CMD). Their prominence may vary across age groups but this issue has received little systematic investigation. *Methods* Data were analysed from the 2000 UK National Survey of Psychiatric Morbidity comprising 8,580 participants aged 16–74 years. A history of recent life events pertaining to health threats, bereavement, interpersonal problems and redundancy was established for the preceding six months. Participants were also asked about earlier lifetime stressors including sexual abuse and expulsion from school. CMD, depression and generalised anxiety disorder were ascertained through the revised Clinical Interview Schedule. *Results* The strongest associations between LEs and CMD were for recent threats to health, recent interpersonal problems and lifetime stressors. Recent LEs were more strongly associated with depression than anxiety whereas the associations for lifetime stressors were similar in strength. The strength of

association between recent LEs and CMD increased steadily up to the 45–54 years age group and then declined. In the 65–74 year age range, CMD was not significantly associated with any recent LE but instead was associated with the following lifetime stressors: bullying, sexual abuse, running away from home, and institutional care in childhood. *Conclusions* Recent life events were most strongly associated with CMD in mid-rather than early or late adult life. In later life, stronger associations were found with lifetime stressors than recent events.

■ **Key words** life events – depression – anxiety – common mental disorders

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Introduction

Stressful life events are recognized to be important in the aetiology of common mental disorders and are an important focus for psychological intervention in clinical settings. Life events are associated with a higher risk of depression in the general population [1, 3, 4] and contribute to the heritability of depression [12]. Community studies in working age adults have found that life events are also associated with anxiety disorders [24]. Less research has been carried out on life events as risk factors for depression in post-retirement age groups [11, 27]. Specific life events may have particular salience, such as bereavement, threats to health and interpersonal conflicts [9, 23]. Associations between poor physical health and anxiety disorders have also been reported in older populations [22].

Age variations in associations between life events and common mental disorder remain unclear. In the US National Comorbidity Survey, the effects of childhood adversities were found to persist beyond childhood with the type of adversity showing little specificity [20]. At the other end of the age-range,

Henderson et al. [14] speculated that older people report fewer life events, and that the impact of life-events in terms of unpleasantness and threat is less in later life. Older people were found to report fewer life events before the onset of depression than a younger group [26]. Furthermore, early maternal loss is associated with depression in working-age adults [3], but early parental loss was not associated with depression in an older sample [23].

As far as we are aware, there have been no previous attempts to describe variation either in the distribution of life events or in the strength of their associations with CMD across working and post-retirement age groups. Past findings from studies focusing on different age groups cannot be reliably compared due to differences in sampling and methodology, and the age range of most population-based surveys has been too narrow to investigate these issues. We carried out a secondary analysis of data from a large National Survey with a broad age range. Our objectives were as follows: (i) to describe age variation in the frequency of common stressors—both recent life events and adverse lifetime experiences; (ii) to compare associations with depression and generalised anxiety disorder in the total population; and (iii) to investigate variation by age in the strengths of association between life events and common mental disorders.

Subjects and methods

■ Study sample

Data were analyzed from the second National Survey of Psychiatric Morbidity among adults living in private households, carried out in England, Wales and Scotland in 2000 by the Office for National Statistics [29]. The primary sampling units (postal sectors) were selected from the Small Users Postcode Address File stratified for region and social class composition to generate a nationally representative sample. Households were randomly selected from within each unit and, in each household containing at least one person aged between 16 and 74 years, one person was randomly selected and invited to participate. A total of 12,792 adults were sampled, resulting in 8,580 participants. Interviews were carried out in participants' homes by trained lay interviewers and consisted of a series of structured interviewer-administered measurements. The overall purpose of the survey was to ascertain the prevalence and impact of common mental disorders in a nationally representative sample. A sub-sample were also evaluated for personality disorder and psychotic symptoms (not considered in this paper). Information was also collected on potential risk factors for mental disorder including life events.

■ Measurements

The revised Clinical Interview Schedule (CIS-R) [21] was administered to all participants. This is a widely used fully-structured assessment of psychiatric morbidity [16]. CMD was defined from the CIS-R, using standard criteria. Scores for selected items from each section of the CIS-R were totalled to give an overall score (with a maximum of 57 points), and CMD was defined as present on the basis of a score of 12 or above. From responses to the CIS-R and using additional supplemental items (on appetite, weight change

and suicidal ideation), depression and generalised anxiety disorder were diagnosed according to ICD-10 criteria using a standard algorithm.

Participants were asked about their experience of specific events over the last six months and over their lifetime, using a series of show cards. The List of Threatening Experiences scale was administered [7, 8], supplemented by items on traumatic childhood experiences [28]. For the purpose of this analysis we focused only on events ascertained using this scale which were reported by at least 2% of the sample. In addition, earlier stressors were defined from this measure on the basis of the following four reported lifetime events: being bullied, sexual abuse, expulsion from school, or running away from home. Proportions of people with these life events who reported experiencing them in the last six months were all below 3%. Participants were also asked whether they had spent any time in an institution or local authority care as a child and a positive response to either of these questions was added as a fifth lifetime stressor. Age was categorised into 10-year bands for most analyses, with a 9-year band for the youngest group.

■ Statistical analysis

Data were analysed using STATA software. All analyses were carried out using standard weighting procedures to allow for the stratified, clustered sampling, and for non-response. The objectives of the analysis were to describe prevalence rates of recent life events and lifetime stressors by age group, to calculate and compare associations with depression and generalised anxiety disorder, and to calculate and compare associations with CMD between age strata. Age-associated variation was tested for significance using weighted logistic regression procedures with life event \times age group interaction terms for the second of these objectives.

Results

The weighted mean age of the sample was 42.6 years (standard error 0.22) and 50.1% were female. Depression was present in 255 (2.6%), generalised anxiety disorder in 431 (4.4%) and any CMD in 1,402 (15%) Complete data on life events were available in 8,521 participants (99%).

Distributions of individual life events by age groups are summarized in Table 1. Overall there was a small but significant decline in the likelihood of any recent life event across the age-range (OR per 10 year increase 0.94, 95% CI 0.91–0.98). The most marked trends for specific recent life events were a decline in reported relationship breakdown (OR 0.61, 0.54–0.68), reported loss of employment (OR 0.69, 0.61–0.78) and reported loss of a valued possession (OR 0.75, 0.67–0.84). Recent death of a partner or first degree relative increased across most ascending age-groups (OR 1.36, 1.26–1.47). Apart from childhood institutionalisation, lifetime stressors were reported less frequently in older age groups (OR for any lifetime stressor 0.76, 0.74–0.80). The associations between age and health-related or bereavement-related life events were not substantially modified by gender (age \times sex interaction terms $P > 0.10$). On the other hand, the negative associations between age and both recent relationship breakdown and any lifetime stressor were stronger in women than men (age \times sex interaction terms $P = 0.065$ and $P < 0.001$ respectively).

Table 1 Distribution of individual life-events by age

Individual life events	Prevalence (%) in sample (<i>n</i> = 8,350)	Prevalence by age group (%)					
		16–24 (<i>n</i> = 794)	25–34 (<i>n</i> = 1,683)	35–44 (<i>n</i> = 1,849)	45–54 (<i>n</i> = 1,544)	55–64 (<i>n</i> = 1,442)	65–74 (<i>n</i> = 1,268)
<i>Within last six months</i>							
Illness/injury/assault to self	1.9	1.2	1.6	2.0	2.2	1.7	3.1
Illness/injury/assault to a relative	2.9	3.1	3.3	3.3	2.5	2.4	2.5
Death of a partner/first degree relative	2.9	0.9	1.3	2.5	4.5	5.0	3.8
Death of a friend/other relative	8.5	10.0	7.8	6.5	8.8	9.2	10.0
Relationship breakdown/divorce/separation	2.0	4.1	3.0	2.6	0.8	0.5	0.2
Serious problem with friend/relative	3.0	4.2	3.1	3.1	3.2	2.3	2.7
Loss of employment	2.4	5.2	2.3	2.5	2.3	1.2	0.1
Loss or theft of a valued possession	2.7	4.8	3.3	2.9	2.1	1.2	1.4
Any of the above	22.5	28.2	21.6	21.3	22.2	20.5	21.4
<i>Lifetime</i>							
Bullying	18.1	27.0	23.0	20.3	14.7	9.8	8.9
Sexual abuse	3.4	2.9	4.2	4.4	3.8	2.8	1.1
Expulsion from school	1.7	2.9	2.3	2.4	1.3	0.6	0.2
Running away from home	5.2	8.1	7.8	5.9	3.6	2.4	1.2
Institutional care in childhood	3.1	2.0	3.4	4.2	2.7	3.3	2.2
Any of the above	24.3	33.2	31.0	27.3	20.8	15.7	11.6

Age and sex adjusted associations between life events and different case definitions are described in Table 2. Seven of the eight recent life events were more strongly associated with depression than generalised anxiety disorder, although the differences in odds ratios were not substantial and confidence intervals overlapped in all cases. Associations between lifetime stressors and these two outcomes were very similar in strength.

Associations between life events and CMD across the sample age-range are summarised in Table 3. In the total sample, CMD was most strongly associated with recent threats to health and to interpersonal problems. All five lifetime stressors were strongly associated with CMD. Overall there was no evidence for a consistent monotonic change in strength of association across the age range of the sample. The *p*-value for the interaction term between any recent life event and age group (entered as a 6 category ordinal variable) was 0.51; the *P*-value for the interaction term between any lifetime stressor and age group was 0.77. None of the age-interaction terms for individual recent or lifetime stressors were significant (all *P*-values > 0.9). Instead, most of the recent life events and lifetime stressors were most strongly associated with CMD in the middle of the age range and weakest in the oldest and youngest age groups, although variation was not substantial. Odds ratios for the association between any recent life event and CMD were 1.91 in men and 2.18 in women. Odds ratios for the association between any lifetime stressor and CMD were 3.11 in men and 2.85 in women. Gender interaction terms were not significant in these models (*P*-values 0.90 and 0.54 respectively). Associations between any recent life event and CMD was also virtually identical in strength between those who did or did not report any lifetime stressor (odds ratios 1.97 and 1.90 respectively).

Discussion

In this analysis of a large national dataset, we found a modest reduction in the overall frequency of reporting recent life events across the adult age range. Specific life events reported also varied by age, with older participants more likely to report threats to health and less likely to report breakdown in relationships. Most lifetime stressors were also less likely to be reported by older participants. For most recent life events, associations with depression were stronger than those with generalised anxiety disorder. For lifetime stressors, associations were similar in strength for both outcomes. For recent life events, associations with common mental disorder were most often strongest in the middle of the age range. For lifetime stressors, there was no substantial or consistent age variation in strengths of association with CMD. In the oldest age group (65–74 years), CMD was significantly associated with several lifetime stressors but not with any recent life event.

A particular strength of this study was that data were derived from a large nationally representative sample. Life events and CMD were identified from widely used schedules. The age range was sufficiently broad to allow adequate investigation of variation by age, and there were sufficient numbers within each age stratum to allow precise measurement both of life event frequency and strength of association with CMD. The time span applied for 'recent' life events was six months which would be expected to capture most of the immediate effect on mental illness since this has been hypothesised to manifest within 2–6 months following a stressful event [25]. The principal limitation of this study is that data were cross-sectional. One drawback is the potential for recall bias

Table 2 A comparison of strengths of association between individual life events, common mental disorder, depression and generalised anxiety disorder

	Strength of association (odds ratio, 95% CI) ^a		
	Common mental disorder	Depression	Generalised anxiety disorder
Within last six months			
Illness/injury/assault to self	4.4 (3.1–6.0)	6.0 (3.5–10.2)	3.2 (2.0–5.2)
Illness/injury/assault to a relative	1.8 (1.3–2.5)	2.5 (1.5–4.4)	2.4 (1.5–3.6)
Death of a partner/first degree relative	2.0 (1.5–2.8)	2.2 (1.2–3.9)	1.3 (0.8–2.2)
Death of a friend/other relative	1.2 (0.9–3.8)	2.0 (1.3–3.0)	0.8 (0.5–1.2)
Relationship breakdown/divorce/separation	2.7 (1.9–3.8)	3.6 (1.9–6.7)	2.8 (1.6–4.9)
Serious problem with friend/relative	3.0 (2.2–4.0)	3.4 (2.1–5.5)	3.0 (2.0–4.6)
Loss of employment	1.6 (1.0–2.4)	0.5 (0.2–1.3)	1.6 (0.8–3.1)
Loss or theft of a valued possession	1.8 (1.3–2.6)	3.0 (1.6–5.5)	1.8 (1.0–3.2)
Any of the above	2.1 (1.8–2.4)	2.5 (1.9–3.4)	1.6 (1.2–2.0)
Lifetime			
Bullying	2.4 (2.1–2.8)	2.5 (1.8–3.4)	2.5 (1.9–3.2)
Sexual abuse	7.0 (5.5–8.9)	5.1 (3.4–7.6)	5.1 (3.6–7.1)
Expulsion from school	3.3 (2.2–4.9)	3.2 (1.6–6.2)	4.4 (2.7–7.2)
Running away from home	4.1 (3.2–5.2)	4.8 (3.3–7.0)	4.6 (3.2–6.4)
Institutional care in childhood	2.9 (2.2–3.9)	3.5 (2.3–5.5)	3.1 (2.0–4.7)
Any of the above	2.9 (2.6–3.3)	3.0 (2.2–4.1)	3.2 (2.5–4.1)

^a Adjusted for age and sex

Table 3 Strength of association between individual life-events and common mental disorders by age, quantified by odds ratios

Individual life events	Odds ratio (95% CI) for total sample	Odds ratio by age group					
		16–24	25–34	35–44	45–54	55–64	65–74
Within last six months							
Illness/injury/assault to self	4.4 (3.1–6.0)	3.8	2.5	5.8*	7.1*	7.3*	2.2
Illness/injury/assault to a relative	1.8 (1.3–2.5)	1.5	2.7*	1.6	2.4*	0.7	1.0
Death of a partner/first degree relative	2.0 (1.5–2.8)	2.2	3.7*	1.6	2.6*	1.9	1.1
Death of a friend/other relative	1.2 (0.9–3.8)	1.0	1.0	1.5	1.3	1.3	1.3
Relationship breakdown/divorce/separation	2.7 (1.9–3.8)	2.2	2.4*	3.0*	3.7*	2.5	a
Serious problem with friend/relative	3.0 (2.2–4.0)	2.2	2.3*	5.6*	2.8*	3.1*	1.9
Loss of employment	1.6 (1.0–2.4)	1.7	2.9*	1.0	0.8	0.9	a
Loss or theft of a valued possession	1.8 (1.3–2.6)	1.3	1.0	3.8*	1.3	2.7	1.7
Any of the above	2.1 (1.8–2.4)	1.6*	2.0*	2.5*	2.5*	2.1*	1.4
Lifetime							
Bullying	2.4 (2.1–2.8)	2.0*	2.6*	2.5*	2.4*	2.0*	2.3*
Sexual abuse	7.0 (5.5–8.9)	4.6*	6.3*	8.6*	8.2*	4.8*	5.6*
Expulsion from school	3.3 (2.2–4.9)	1.6	4.3*	3.0*	7.8*	a	3.0
Running away from home	4.1 (3.2–5.2)	3.4*	3.9*	4.7*	3.8*	3.5*	6.8*
Institutional care in childhood	2.9 (2.2–3.9)	1.6	3.4*	3.2*	3.8*	1.2	4.5*
Any of the above	2.9 (2.6–3.3)	2.8*	3.1*	3.2*	2.9*	2.1*	3.0*

* Significant association between individual life event and CMD within individual age stratum ($P < 0.05$)

^a Unable to calculate (no participants with both exposure and outcome)

so that causation cannot be assumed. A second is that effects of age and birth cohort cannot be distinguished. A third is that effects on incidence cannot be distinguished with those on recovery. Further potential confounding factors for the association between life events and mental disorder (such as socioeconomic status, physical health and personality) were not included in regression models. However the primary objective was to investigate age-modification of these associations and we do not believe that other factors were likely to be responsible for obscuring or exaggerating age-interaction. A wide range of life events were considered; however, these were included according to the frequency with which they were reported, rather than their strength of association with

the outcome and it is possible that high salience rare events were not captured.

Most of the specific recent life events were significantly associated with CMD, with adverse health events and interpersonal problems acting most strongly in this respect. Life events have been suggested to decline in impact in older people [14] and a decline in certain life stressors such as occupational or interpersonal difficulties has been suggested to account for a decline in psychological distress across the 20–64 year age range [17]. Our results suggest that the association with age is more complex in that recent life events were most strongly associated with mental disorder in mid-life compared to the youngest and oldest groups. This might explain findings in other

studies of insubstantial age-variation [10, 15]. The reason for a stronger association in mid-life, if confirmed, requires further elucidation. It could represent a specific vulnerability in this age group. It might also reflect a combination of underlying factors, with both vulnerability and resilience increasing with age. Increased vulnerability of people in mid-compared to early adulthood might include increased (perceived or actual) financial, lifestyle or psychological consequences of life events when they occur. These may become less important around and after retirement, reducing vulnerability. An important limitation of this study is that the upper age limit of the sample will have excluded age groups where frailty and dependency are particularly common, and associations in more advanced old age cannot be predicted.

Life events in this study, as in the majority of epidemiological research of this nature, were defined according to self-report from a limited list of 'present/absent' events. The 'validity' of such scales (as well as their reliability) relies on the extent to which events are accurately reported. This in turn depends on participants being able to recall and willing to report actual previous events, and on participants not falsely reporting events. Age variation in frequency of reported events may be influenced by all of these factors in addition to the frequency of actual events. Cognitive impairment—to an extent that would influence the ability to recall important previous or recent events—is unlikely to be an important factor in this sample since, even in 65–74 year olds, prevalence rates of clinical dementia are low and unlikely to influence recollection across the sample as a whole. Perceived salience of life events, and willingness to report these, are more likely to be important explanations for variation by age group (or birth cohort) and cannot be excluded as factors underlying the observed associations between age and life stressors in this sample. This may be particularly relevant to the observed negative associations between increased age and reported frequency of lifetime stressors. However, if this had occurred, it is interesting that lifetime stressors remained strongly associated with CMD in the older age groups, despite the declining frequency with which they were reported. In theory this ought to increase with age, if these stressors are believed to accumulate throughout life. However, it is not certain whether a question on bullying or sexual abuse would be construed by participants as referring to childhood or adult life, even though lifetime experiences were being asked about.

Gender did not modify the association between life events and CMD substantially. Kendler et al. [19] found that women were more vulnerable to the long-term contextual threat posed by recent life events, but the excess risk for major depression in women was confined to subjects with low stress exposure. However, that study focused on major depression as an

outcome, and our findings may not be directly comparable.

In general, associations with CMD were stronger for lifetime stressors than for recent life events. Although there were limited data on the timing of these events, it is likely that most represented occurrences in childhood and adolescence. While recall bias cannot be excluded as an explanation, this finding is consistent with findings from previous community studies [6, 20]. It might be expected that, although early experiences contribute to vulnerability, their effects may become less pronounced as age advances. We found instead that the strength of association between lifetime stressors and common mental disorder did not vary substantially across the age range of the sample. There has been some suggestion that childhood stressors might "sensitize" individuals to stressors in adult life [13]. However, we found no interaction between recent events and lifetime stressors as exposures for CMD as an outcome.

Brown et al. [5] hypothesised that it is the meaning of events that determines whether or not they precipitate mental illness. They found that life events that differed in terms of their meaning were associated with different mental disorders as outcomes, with events related to loss leading to depression, and threatening events to anxiety [2]. However, Kendler et al. [18] in a population-based sample of female twins found that the specificity of individual stressful life events for depression and generalised anxiety disorder was modest. A limitation of our study and many others is that life events were classified under broad headings, and are likely to vary substantially with respect to their individual meaning. A challenge for future research is to capture individual meaning in the context of group-level epidemiological analysis.

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