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Life stress and mental disorders in the South African Stress and Health study

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Abstract

Background—Although stressful life events (SLEs) are associated with psychopathology, the contribution from distal and proximal events and the specificity of their association with common mental disorders require further exploration. We examined the association of recent life events and past adversities to mood, anxiety, substance use and impulse control disorders in South Africa.

Methods—Data were analysed from the South African Stress and Health study, a population-based study of mental disorders in a nationally representative sample of 4 351 adults. Psychiatric disorders were assessed with the Composite International Diagnostic Interview (CIDI). This included questions covering early and later SLEs (negative life events, relationship stress, partner violence, social strain and adverse events during childhood) and various socio-demographic variables. Logistic regression models were constructed for 3 957 respondents (2 371 female, 1 586 male) with no missing covariate data, to assess life stress and socio-demographic predictors of 12-month and lifetime disorder.

Results—Recent negative life events and relationship problems were significant predictors of any 12-month disorder and any lifetime disorder. Physical partner violence predicted any lifetime disorder. There was evidence of specificity for the prediction of mood versus anxiety disorders, with childhood adversity specifically associated with mood disorders but not anxiety disorders. Single marital status was the strongest socio-demographic predictor of any 12-month and any lifetime disorder.

Conclusions—Stressful life events, distal and proximal, contribute significantly and independently to the prediction of major psychiatric disorders among South Africans,

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underscoring the importance of screening adversities in adults with common mental disorders, and of providing appropriate adjunctive interventions.

The role of stressful life events (SLEs) in the pathogenesis of mental disorders is not well understood. Individuals vary greatly in their response to SLEs, with some more susceptible to morbidity than others in the face of adversity. This phenotypic variance is accounted for by genetic and individual-specific environmental factors.[1] It has been suggested that SLEs that are largely dependent on an individual's own behaviour are more heritable than 'fateful' events that are independent of an individual's actions.[2] Twin studies have provided the strongest evidence of the magnitude of effect of the environment relative to genes, with environmental stressors contributing as much of the variance to a disorder, such as depression, as genetic influences.[3]

SLEs can herald the onset of depression and/or affect the symptom profile, expression, course (e.g. illness duration, symptom exacerbation), treatment and outcome.[4–7] They are characterised as those of recent onset and those that occurred early in life. Recent or proximal events (e.g. death or illness in the family, interpersonal violence, financial difficulties) have commonly been associated with risk of mood and anxiety disorders.[8–11] Past studies have also linked distal events, such as adversities in childhood (e.g. parental death/separation/divorce), to the onset of common mental disorders in adulthood.[8,12] A central question is the relationship of early adversity to more recent events in the onset of psychiatric disorders. Evidence suggests that childhood adversity, when combined with current stressors, increases vulnerability to adult depression by 3.5 – 11-fold.[12] This has been proposed to occur through sensitisation of stress-responsive neurobiological systems (e.g. the hypothalamic-pituitary-adrenal axis) as a consequence of early-life stress which may, in turn, be moderated by specific genetic variants (polymorphisms).[1,13,14] The resulting sensitisation in individuals who have experienced significant childhood adversity may lead to a heightened reactivity to subsequent stress such that lower levels of stress may trigger the onset of a depressive episode.[15,16]

Few nationally representative population-based studies have examined the contribution of proximal and distal life events to various psychiatric disorders. There are few data from low- and middle-income countries, where the distribution of proximal and distal life events may systematically differ from Europe and North America. In our sample, trauma (e.g. criminal victimisation) was found to be positively related to high levels of psychological distress, and there was a cumulative effect of trauma exposure.[17] We investigated the relationship of major life events (recent life events and childhood adversity) to common psychiatric disorders in South Africa. We sought to determine whether different categories of life stress, and specific socio-demographic factors, are associated with an increased risk of anxiety, mood, substance use and impulse control disorders.

Methods

Survey respondents

The South African Stress and Health (SASH) study comprised a sample of 4 351 adults, of all race and ethnic backgrounds, living in both households and hostel quarters, selected using a three-stage clustered area probability sample design across all nine provinces. Recruitment, consent and field procedures were approved by the Human Subjects Committees of the University of Michigan and Harvard Medical School, and by a single project assurance of compliance from the Medical University of South Africa that was approved by the National Institute of Mental Health. For the study methodology see Williams *et al.*[18]

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Assessment of mental disorders

Interviews were conducted face to face by 40 – 60 trained lay interviewers in one of seven languages: English, Afrikaans, Zulu, Xhosa, Northern Sotho, Southern Sotho and Tswana. Data were collected between January 2002 and June 2004. Field interviewers made up to three attempts to contact each respondent. The overall response rate was 85.5%. The World Health Organization Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) was used to assess the presence of DSM-IV (*Diagnostic and Statistical Manual*, 4th edition) disorders.[19] The CIDI is a structured diagnostic interview that is lay administered and can generate diagnoses according to the ICD-10 (*International Statistical Classification of Diseases and Related Health Problems*, 10th revision) and DSM diagnostic systems. The mental disorders assessed in the SASH study were anxiety disorders (panic disorder, agoraphobia, social phobia, generalised anxiety disorder, post-traumatic stress disorder), mood disorders (major depressive disorder, dysthymia), substance use disorders (SUDs) (alcohol abuse, alcohol dependence, drug abuse, drug dependence), and intermittent explosive disorder (IED). DSM-IV organic exclusion rules and diagnostic hierarchy rules were applied to all diagnoses, except in the case of SUDs where abuse was defined with or without dependence.

Life stress variables—Several different domains of life stress were investigated.

Global negative life events—Respondents were asked the following question about 13 potentially negative life events: 'In the past 12 months, did you experience any of the following life events?' Types of events included serious illness or injury, being the victim of a serious physical attack or assault, serious illness, injury, physical attack or assault to someone very close, being robbed or having one's home burgled, the death of anyone close, separation from a spouse or partner because of marital difficulties, break-up of any other close relationship, being fired from one's job, retiring from a job when one did not want to, losing one's job for some other reason, unsuccessfully searching for a new job for more than a month, being in a major financial crisis, and problems with the police. Global negative life events were categorised as ≥3 or <3 events (Table I).

Relationship stress—Respondents were asked: 'In the past 12 months, did you have serious ongoing disagreements or problems getting along with any family members or relatives, any close friend, anyone at work?' Relationship events were categorised as ≥1 or 0 events (Table I).

Domestic violence/physical partner violence—Domestic violence victimisation was assessed by the frequency with which the respondent had been victimised by her/his current or former spouse or partner. Victims were asked: (*i*) 'How often did your (most recent) spouse ever do any of these things on this list (pushed, grabbed or shoved, threw something, slapped or hit) to you?'(often, sometimes, rarely or never); and (*ii*) 'Over the course of your relationship, how often has your spouse/partner ever done any of these things on this list (pushed, grabbed or shoved, threw something, slapped or hit) to you?'(often, sometimes, rarely or never).

Domestic violence perpetration was assessed by the frequency with which the respondent had slapped or hit, thrown something at, or pushed, grabbed or shoved her/his current or former spouse or partner. Perpetrators were asked: (*i*) 'Thinking about the time when you and your (most recent) spouse were living together, when you had a disagreement, how often did you ever do any of the things on this list (pushed, grabbed or shoved, threw something, slapped or hit) to your spouse?' (often, sometimes, rarely or never); and (*ii*) 'People handle disagreements in many different ways. Over the course of your relationship,

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how often have you ever done any of these things on this list (pushed, grabbed or shoved, threw something, slapped or hit) to your (current) spouse/partner?' (often, sometimes, rarely or never). Both victim and perpetrator variables were categorised as 'often'/'sometimes'/ 'rarely' experienced/perpetrated domestic violence, with the reference category 'never' experienced/perpetrated domestic violence (Table I).

Social strain—Respondents were asked: 'How many demands do your family members and friends make of you?' (a lot, some, little, not at all). Demands were further categorised as 'a lot'/'some' with the reference category 'a little'/'not at all' (Table I).

Early-life stress—Early-life stress variables from the 'childhood' module were included, as follows: parental death before age 17, parental divorce before age 17, separation from parent(s) before age 17, male head of the household (MHH) mostly unemployed in childhood (excluding MHHs who stayed at home to raise children), and female head of the household (FHH) mostly unemployed in childhood (excluding FHHs who stayed at home to raise children or stayed at home because their partners did not want them to work). Early-life stress variables were summarised as: (*i*) 0 or ≥1 early-life social stresses (death of a parent, divorce of parents, separation from parents); and (*ii*) 0 or ≥1 early-life economic stresses (MHH unemployed, FHH unemployed) (Table I).

Statistical analysis

To account for the stratified multi-stage sample design, the data were weighted to adjust for differential probability of selection within households as a function of household size and clustering of the data, and for differential non-response. A post-stratification weight was also used to make the sample distribution comparable to the population distribution in the 2001 South African census for age, sex, and province. The weighting and geographical clustering of the data were taken into account in data analyses by using the Taylor series linearisation method in the SUDAAN statistical package.[20] Logistic regression models were used to analyse life stress predictors for each 12-month and lifetime DSM-IV disorder.

Model 1 included the following socio-demographic predictor variables: gender, age, race, income, marital status, years of education, employment status, urban/rural, and income. Racial categories (black, coloured, Indian, white) were used in the analyses as a marker of historical social and economic opportunity in relation to health outcomes. Two other socioeconomic status (SES) measures were included – assets and wealth/debt status. Assets were calculated as a count of the total number of seven household appliances (refrigerator, vacuum cleaner, television, hi-fi or music centre, microwave oven, washing machine and video-cassette recorder) and seven household resources (running water, domestic servant, automobile, flush toilet, built-in kitchen sink, electric stove or hotplate, and working telephone) that respondents owned/employed, as well as three financial activities that they engaged in (shopping at supermarkets, using financial services such as a bank account, automatic teller machine card or credit card, and having an account or credit card at a store). The alpha for this scale was 0.92 overall (0.89 for blacks, 0.89 for coloureds, 0.74 for Indians and 0.70 for whites). Wealth was assessed by respondents reporting whether there would be any money left over if all their assets were sold and all their debts paid. Respondents reporting some wealth were contrasted with those reporting no or negative wealth and those who refused to provide an answer or indicated that they did not know the answer.

Model 2 included the socio-demographic predictors included in model 1 plus the following life stress variables: (*i*) global negative life events, past 12 months; (*ii*) relationship problems, past 12 months; (*iii*) perpetrator domestic violence scale (1 = never, 4 = often);

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(*iv*) victim domestic violence scale (1 = never, 4 = often); and (*v*) social strain/demands (higher score = more).

Model 3 included the socio-demographic predictors in model 1 and the life stress variables included in model 2, plus the early (childhood) life stress indicator variables described above.

All models were run on 3 957 subjects (2 371 females and 1 586 males) with no missing data for the covariates using SUDAAN Proc RLOGIST (complex sampling design). Logistic regression coefficients and their design-corrected standard errors were exponentiated and are reported here as odds ratios (ORs) and 95% confidence intervals (CIs), with the significance level set at $p \leq 0.01$.

Results

Past-year and lifetime prevalence of mental disorders

The prevalence rates (N=4 351) of having a specified mental disorder in the past year (12 months) and of ever having a disorder (lifetime) were 4.9% and 9.8% for mood disorders, 8.1% and 15.8% for anxiety disorders, 5.8% and 13.3% for SUDs and 1.8% and 3.0% for IED, respectively.

Socio-demographic correlates of stress

Table I shows the socio-demographic correlates of stress in the sample. Compared with non-victims, victims of domestic violence were significantly more likely to be female, Indian, ≥35 years of age, married, less educated, and earning a lower income. There were no gender differences for exposure to other types of stress, including early social and economic hardships. Blacks and Indians were more likely than coloureds or whites to endorse greater exposure to global negative life events, social demands and economic stresses.

Stress-related predictors of mental disorders

Final predictive logistic regression models for 12-month and lifetime disorders are presented in Tables II and III, respectively.

Twelve-month or lifetime mood disorder

Negative life events in the past 12 months and childhood parental separation significantly predicted any 12-month and any lifetime mood disorder. Death of a parent while growing up was further predictive of lifetime mood disorder but did not modify the effect of recent negative life events on depression. Female gender and fewer years of education were also predictive of mood disorder (12-month and lifetime).

Twelve-month or lifetime anxiety disorder

Overall, negative life events and relationship problems in the past 12 months significantly predicted any 12-month and any lifetime anxiety disorder. Childhood adversity was, however, not predictive of an anxiety disorder (12-month or lifetime). As with mood disorders, female gender was significantly associated with an anxiety disorder diagnosis (12-month and lifetime). Urban location was also associated with a lifetime anxiety disorder diagnosis.

Twelve-month or lifetime SUD

Relationship problems in the past 12 months significantly predicted any 12-month SUD. A lifetime diagnosis of SUD was significantly related to negative life events and relationship

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problems in the past 12 months, as well as to marital status (single). Indian race was protective for 12-month SUD and female gender was protective for both 12-month and lifetime SUD.

Twelve-month or lifetime IED

Relationship problems in the past 12 months significantly predicted 12-month and lifetime IED. Education (fewer years of education) also predicted 12-month IED, while lifetime IED was predicted by higher SES (assets), living in an urban rather than a rural area, and growing up in a home where the male head of the household was unemployed.

Any 12-month or lifetime disorder (anxiety disorder, mood disorder, SUD, IED)

Past 12-month negative life events, past 12-month relationship problems, parental death and parental separation significantly predicted any 12-month disorder. With the exception of parental separation, the aforementioned life stress variables also predicted any lifetime disorder. In addition, any lifetime disorder was predicted by partner violence (either as victim or perpetrator). Marriage was protective, while single marital status (separated, divorced, widowed, never married) predicted both any 12-month and any lifetime disorder.

Discussion

These results demonstrate a strong association between common mental disorders and a number of recent and early-life stressors, which is consistent with findings from other community studies.[11,12] Recent stressors, namely negative life events and relationship problems, were significant predictors of *any* 12-month disorder as well as *any* lifetime disorder. Relationship problems were not predictive of mood disorders (12-month or lifetime) although relationship stress did predict all other disorders (12-month and lifetime).

We also found some specificity for the prediction of mood versus anxiety disorders. Recent stressful events and early childhood adversity (involving loss) were both associated with mood disorders; however, early childhood adversity was not pathogenic for anxiety disorders. Studies have found moderate to high levels of event specificity[21–23] or no evidence of specificity.[24] Others have found that childhood adversity places individuals at particular risk for co-morbid depression and anxiety, with the co-morbid transition probably induced by present and past stress-inducing events.[25,26] While this may be a possible explanation in the present study, we did not assess for co-morbidity in cases of pure disorder. It is also possible that childhood adversity operates at a differential threshold at which SLEs provoke depression and anxiety in adulthood, with an amplifying effect for depression relative to anxiety. Early childhood adversity in the form of parental death was also predictive of any lifetime disorder, in particular lifetime mood disorder. Childhood stressors in the form of loss events (viz. parental death), interpersonal trauma and other adversities have consistently been associated with the onset of mood, anxiety and addictive disorders.[8,27]

With regard to other recent stressors, domestic violence (as victim and perpetrator) predicted any lifetime disorder but not any 12-month disorder. Perpetration of violence was significantly associated with any lifetime disorder. It is possible that pre-existing mental illness constituted a risk factor for the infliction of partner violence. However, inferences about the causal direction of relationship between violence perpetration and risk of mental disorder cannot be made owing to the cross-sectional nature of the data.[28] The association between partner violence and mental disorder is in keeping with both cross-sectional and longitudinal studies that have found a consistent association with depression, post-traumatic stress disorder, other anxiety disorders and SUD.[29,30] Partner violence in South Africa

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contributes significantly to the national burden of disease. Of 17 risk factors included in the South African Comparative Risk Assessment study for the year 2000, interpersonal violence (of which partner violence accounted for 62.4%) accounted for the loss of 8.4% of all disability-adjusted life-years.[31]

Our data show that marital status (separated, divorced, widowed, never married) is the only socio-demographic correlate of any 12-month or any lifetime disorder, consistent with other general population surveys.[32] Female gender was associated with a significantly higher odds of any mood and any anxiety disorder, but with a significantly lower odds of any SUD. Female gender was found to be a risk factor for mood and anxiety disorders and to be protective for SUDs.[32,33] SLEs also have a stronger association with symptoms of depression and anxiety in women than in men.[34] Lower educational attainment was predictive of mood disorders but not other mental disorders. This finding supports a study across three provinces in South Africa that found lower educational attainment, among other social and economic correlates, to predict depression scores in the general population,[35] pointing to the need for further research into the social determinants of stressors throughout the life course. Variation in age was not significantly associated with SLEs or with 12-month/lifetime disorder. Recent life events have a declining impact in older people, with the strength of association with common mental disorders increasing steadily up to middle age and then subsiding.[36]

These results should be interpreted in the light of methodological limitations. First, the data are cross-sectional and so the temporality of associations cannot be assumed. Second, the occurrence of life events relied on retrospective recall. Adverse events may have been under-reported secondary to recall problems or over-reported secondary to mental illness (i.e. mental illness in participants at the time of interview may have affected their reports of stressful events). Further, there may have been telescoping of events with remote events reported as more recent occurrences.[37] Third, precise details of the timing of stressful events relative to the onset of mental disorder were not elicited. Fourth, the influence of co-morbidity was not assessed. The effects of specific events on specific disorders observed here may in fact not be unique to these disorders but may represent a ‘loading’ effect from a number of co-morbid disorders. Other studies have noted strong clustering of psychosocial adversities and lifetime co-morbidity.[8] Fifth, the subjective salience of life events and their cumulative adversity in relation to disorder risk were not specifically examined. Increased lifetime exposure to adversity, both proximal and distal events, have been associated with an increased risk of psychiatric disorder.[10] Moreover, meanings (e.g. danger, loss, and disappointment) attributed to different life events can be associated with different mental health outcomes. For example, stressful events perceived as involving loss appeared to be particularly important for onset of clinical depression, and events perceived as involving danger for the onset of anxiety disorders.[38]

A notable strength is that this is the first study to demonstrate a relationship between recent and early-life stress and mental disorders among South Africans, in a survey representative of the general population. Our results underscore the importance of screening for recent and past adversities in adults presenting to clinical settings with common mental disorders, and of providing appropriate adjunctive interventions targeted at improving coping skills and enhancing self-efficacy.

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Table I

Demographic correlates of stress (N=3 957)

				Domestic violence			Early life stresses	
	N	Global life events ≥3	Relationship events ≥1	Perpetrator (ever)	Victim (ever)	Social strain (a lot/some)	Social ≥1	Economic ≥1
Total								
N	3 957	991	848	666	651	1 572	1 111	819
%		25.9	21.8	15.8	15.3	38.4	28.3	21.3
Gender								
Male	1 586	26.9 (1.8)	23.2 (1.8)	14.4 (1.4)	11.2 (0.9)	38.7 (2.1)	28.5 (1.3)	20.9 (1.4)
Female	2 371	25.1 (1.1)	20.6 (1.2)	17.0 (1.0)	19.0 (1.1)	38.2 (1.4)	28.1 (1.2)	21.7 (1.2)
χ^2 (*p*)		1.0 (0.326)	1.9 (0.175)	2.7 (0.108)	31.7 (0.000)	0.1 (0.795)	0.0 (0.824)	0.2 (0.621)
Race								
Black	3 007	29.5 (1.4)	22.1 (1.3)	15.0 (0.9)	15.4 (0.8)	40.9 (1.7)	30.0 (1.1)	24.0 (1.1)
Coloured	525	14.8 (2.5)	18.1 (2.8)	18.9 (2.0)	18.4 (2.0)	26.9 (1.6)	29.5 (3.0)	10.8 (1.8)
White	279	11.8 (2.4)	25.8 (5.4)	16.3 (3.5)	9.1 (2.9)	31.4 (5.1)	14.6 (3.7)	12.3 (3.4)
Indian	146	21.8 (6.5)	15.4 (2.4)	23.9 (4.7)	23.0 (4.0)	37.7 (6.5)	25.7 (3.1)	19.6 (4.9)
χ^2 (*p*)		33.6 (0.000)	7.1 (0.079)	5.5 (0.153)	16.3 (0.002)	39.4 (0.000)	9.8 (0.027)	29.6 (0.000)
Age (yrs)								
18 – 34	2 005	28.4 (1.4)	24.7 (1.5)	10.1 (0.9)	10.0 (0.8)	38.0 (1.6)	33.5 (1.3)	21.6 (1.1)
35 – 49	1 159	24.4 (2.0)	21.6 (1.7)	20.7 (1.6)	21.4 (1.6)	38.3 (1.5)	23.7 (1.5)	20.3 (1.6)
50 – 64	577	21.1 (1.6)	14.8 (1.7)	23.2 (2.0)	20.2 (2.2)	40.1 (3.2)	21.6 (2.5)	20.9 (1.9)
≥65	216	24.8 (3.8)	14.9 (3.3)	23.5 (3.3)	20.2 (2.8)	37.5 (3.9)	22.8 (4.2)	25.4 (3.9)
χ^2 (*p*)		18.2 (0.001)	37.2 (0.000)	65.4 (0.000)	64.5 (0.000)	0.6 (0.907)	25.2 (0.000)	1.9 (0.596)
Marital status								
Unmarried	2 033	27.3 (1.6)	23.5 (1.4)	5.6 (0.7)	5.3 (0.7)	38.0 (1.7)	32.6 (1.3)	21.7 (1.2)
Married	1 924	24.5 (1.5)	20.0 (1.3)	26.2 (1.6)	25.5 (1.2)	38.8 (1.9)	24.0 (1.3)	21.0 (1.3)
χ^2 (*p*)		2.1 (0.155)	7.0 (0.010)	156 (0.000)	263 (0.000)	0.1 (0.730)	22.9 (0.000)	0.2 (0.662)
Education								
None	301	23.0 (2.4)	14.1 (2.1)	25.1 (3.1)	24.5 (3.3)	36.5 (4.0)	25.7 (2.7)	25.6 (2.9)
Grade 1 – 7	809	27.6 (2.3)	19.8 (1.6)	21.7 (1.5)	22.8 (1.4)	41.6 (2.3)	30.1 (1.6)	26.1 (2.4)
Grade 8 – 11	1 359	27.9 (1.8)	22.0 (1.6)	15.8 (1.3)	15.5 (1.1)	38.6 (2.3)	28.4 (1.6)	21.7 (1.4)

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				Domestic violence			Early life stresses	
	N	**Global life events ≥3**	**Relationship events ≥1**	**Perpetrator (ever)**	**Victim (ever)**	**Social strain (a lot/some)**	**Social ≥1**	**Economic ≥1**
Grade 12	883	27.5 (1.7)	24.0 (2.2)	11.3 (1.3)	9.6 (1.3)	37.0 (2.3)	28.9 (1.9)	17.8 (1.8)
Grade 13+	605	18.6 (2.0)	23.7 (3.4)	11.6 (1.5)	10.7 (1.3)	37.1 (2.4)	26.2 (2.6)	18.2 (2.0)
χ^2 (*p*)		26.6 (0.000)	14.2 (0.012)	45.8 (0.000)	58.2 (0.000)	4.1 (0.400)	2.9 (0.574)	18.6 (0.002)
Income (R)								
0	572	30.8 (2.3)	19.1 (2.4)	16.7 (1.8)	17.3 (2.1)	35.8 (2.5)	29.5 (2.8)	27.4 (2.3)
1 – 1 500	916	29.2 (1.8)	23.8 (1.9)	17.7 (1.5)	19.3 (1.6)	43.1 (2.0)	31.4 (1.6)	26.2 (1.8)
1 501 – 16 500	857	27.4 (2.4)	21.6 (1.7)	17.4 (1.6)	15.6 (1.7)	40.5 (2.5)	25.5 (2.2)	19.9 (1.6)
16 501 – 97 500	833	22.4 (2.2)	24.2 (2.1)	15.4 (1.6)	13.9 (1.5)	36.6 (2.2)	28.5 (2.4)	15.6 (1.4)
≥97 501	779	21.6 (2.3)	19.2 (2.2)	12.3 (1.5)	11.2 (1.8)	35.1 (2.3)	26.9 (2.1)	19.6 (1.3)
χ^2 (*p*)		16.3 (0.005)	6.7 (0.169)	11.2 (0.033)	12.3 (0.022)	10.9 (0.037)	6.1 (0.208)	36.3 (0.000)
Employment								
Unemployed	2 743	28.9 (1.3)	20.2 (1.2)	13.9 (0.6)	14.1 (0.7)	37.7 (1.6)	29.5 (1.2)	23.0 (1.1)
Employed	1 214	19.5 (1.8)	25.3 (2.0)	19.9 (2.2)	18.0 (1.8)	39.9 (2.1)	25.7 (1.5)	17.7 (1.1)
χ^2 (*p*)		22.5 (0.000)	6.5 (0.014)	7.7 (0.007)	4.4 (0.040)	1.2 (0.273)	3.8 (0.057)	16.8 (0.000)
Location								
Rural	1 657	26.9 (1.8)	21.1 (1.6)	17.5 (1.2)	17.0 (1.1)	41.1 (1.5)	26.5 (1.7)	26.3 (1.8)
Urban	2 300	25.3 (1.5)	22.2 1.7)	14.8 (1.2)	14.3 (1.0)	36.7 (2.1)	29.4 (1.2)	18.2 (1.1)
χ^2 (*p*)		0.4 (0.511)	0.2 (0.642)	2.8 (0.102)	3.3 (0.075)	2.9 (0.095)	1.9 (0.173)	14.1 (0.000)

Values are percentages with standard errors in parentheses.

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Table II

Odds ratios (with 95% confidence intervals) for 12-month DSM-IV disorders (*N*=3 957)

Variables	Any DSM-IV disorder	Anxiety disorder	Mood disorder	Substance disorder	Impulse disorder
Constant	0.09 (0.0 – 0.2)***	0.01 (0.0 – 0.1)***	0.02 (0.0 – 0.1)***	0.05 (0.0 – 0.2)***	0.02 (0.0 – 0.4)**
Female	1.06 (0.8 – 1.3)	1.95 (1.4 – 2.6)***	2.20 (1.4 – 3.5)***	0.27 (0.2 – 0.4)***	0.78 (0.5 – 1.3)
Age	1.00 (1.0 – 1.0)	1.01 (1.0 – 1.0)	0.99 (1.0 – 1.0)	1.00 (1.0 – 1.0)	0.98 (1.0 – 1.0)
White					
Black	1.22 (0.6 – 2.4)	1.98 (0.9 – 4.5)	1.00 (0.3 – 3.3)	1.03 (0.6 – 1.8)	0.31 (0.1 – 0.8)*
Coloured	1.53 (0.8 – 3.0)	2.12 (0.9 – 5.0)	1.38 (0.4 – 4.3)	1.11 (0.6 – 2.0)	0.32 (0.1 – 1.4)
Indian	1.25 (0.5 – 3.1)	0.98 (0.3 – 3.0)	2.86 (0.7 – 12)	0.05 (0.0 – 0.4)**	0.41 (0.1 – 1.5)
Log of income	1.00 (0.9 – 1.1)	1.06 (1.0 – 1.2)	0.98 (0.8 – 1.1)	0.94 (0.9 – 1.0)	1.17 (0.9 – 1.4)
Married	0.76 (0.6 – 0.9)**	0.75 (0.6 – 1.0)*	0.99 (0.7 – 1.4)	0.63 (0.4 – 1.0)*	0.47 (0.2 – 1.1)
Years of education	0.97 (0.9 – 1.0)	0.98 (0.9 – 1.0)	0.93 (0.9 – 1.0)**	1.02 (1.0 – 1.1)	0.88 (0.8 – 1.0)**
Employed	1.08 (0.8 – 1.4)	0.74 (0.5 – 1.0)*	1.13 (0.7 – 1.8)	1.19 (0.8 – 1.9)	0.84 (0.5 – 1.4)
Urban	1.09 (0.8 – 1.5)	1.31 (0.9 – 1.8)	1.19 (0.7 – 1.9)	0.93 (0.6 – 1.4)	2.55 (1.0 – 6.6)*
Other assets	1.02 (1.0 – 1.1)	1.01 (1.0 – 1.1)	1.02 (1.0 – 1.1)	1.01 (1.0 – 1.1)	1.07 (1.0 – 1.2)
Wealth					
Debt	1.16 (0.9 – 1.5)	0.98 (0.7 – 1.5)	1.54 (1.0 – 2.3)*	1.03 (0.6 – 1.8)	1.72 (0.9 – 3.5)
Wealth UK/Rf/miss	0.82 (0.6 – 1.1)	0.88 (0.6 – 1.2)	1.03 (0.6 – 1.6)	0.70 (0.4 – 1.2)	0.81 (0.4 – 1.7)
Global life events	1.15 (1.1 – 1.2)***	1.14 (1.1 – 1.2)***	1.14 (1.0 – 1.3)**	1.11 (1.0 – 1.2)*	1.06 (0.9 – 1.3)
Relationship events	1.52 (1.3 – 1.8)***	1.62 (1.4 – 1.9)***	1.12 (0.9 – 1.5)	1.58 (1.2 – 2.1)**	1.56 (1.1 – 2.2)**
Perpetrator scale	1.13 (1.0 – 1.3)	0.99 (0.8 – 1.2)	1.10 (0.8 – 1.5)	1.07 (0.8 – 1.4)	1.59 (0.9 – 2.9)
Victim scale	1.14 (1.0 – 1.3)	1.22 (1.0 – 1.5)	1.15 (0.8 – 1.6)	1.31 (1.0 – 1.7)*	1.20 (0.7 – 2.2)
Social strain	1.01 (0.9 – 1.1)	0.99 (0.9 – 1.1)	1.14 (1.0 – 1.3)	1.10 (0.9 – 1.3)	1.00 (0.8 – 1.3)
Death of parent	1.64 (1.2 – 2.3)**	1.34 (0.8 – 2.2)	1.41 (0.9 – 2.3)	1.68 (1.1 – 2.6)*	0.99 (0.2 – 6.3)
Divorce of parents	1.19 (0.7 – 2.0)	1.74 (1.0 – 3.2)	0.52 (0.2 – 1.3)	0.99 (0.5 – 2.2)	0.60 (0.2 – 1.8)
Away from parent	1.50 (1.1 – 2.1)**	1.43 (0.9 – 2.3)	1.81 (1.1 – 2.9)**	1.35 (0.8 – 2.2)	1.41 (0.5 – 3.6)
MHH employed					
MHH unemployed	1.04 (0.8 – 1.4)	1.02 (0.7 – 1.6)	1.06 (0.6 – 1.8)	0.81 (0.4 – 1.6)	2.00 (0.8 – 4.8)

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Variables	Any DSM-IV disorder	Anxiety disorder	Mood disorder	Substance disorder	Impulse disorder
MHH employed UK/Rf	0.77 (0.6 – 1.0)	0.76 (0.5 – 1.2)	0.81 (0.5 – 1.3)	0.84 (0.5 – 1.4)	1.00 (0.2 – 4.3)
FHH employed					
FHH unemployed	1.08 (0.8 – 1.4)	1.19 (0.8 – 1.7)	1.01 (0.6 – 1.7)	1.03 (0.6 – 1.7)	1.14 (0.4 – 3.5)
FHH employed UK/Rf	1.00 (0.7 – 1.4)	1.08 (0.7 – 1.6)	0.90 (0.5 – 1.6)	0.90 (0.4 – 1.8)	0.46 (0.1 – 1.5)

* $p \leq 0.05$.

** $p \leq 0.01$.

*** $p \leq 0.001$.

MHH = male head of household; FHH = female head of household; UK = unknown; Rf = refused to answer.

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Table III

Odds ratios (with 95% confidence intervals) for lifetime DSM-IV disorders (N=3 957)

Variables	Any DSM-IV disorder	Anxiety disorder	Mood disorder	Substance disorder	Impulse disorder
Constant	0.20 (0.1 – 0.5)***	0.03 (0.0 – 0.1)***	0.06 (0.0 – 0.2)***	0.10 (0.0 – 0.3)***	0.02 (0.0 – 0.2)***
Female	0.92 (0.8 – 1.1)	1.76 (1.4 – 2.2)***	1.92 (1.4 – 2.6)***	0.24 (0.2 – 0.3)***	0.81 (0.6 – 1.2)
Age	1.00 (1.0 – 1.0)	1.01 (1.0 – 1.0)	1.00 (1.0 – 1.0)	1.00 (1.0 – 1.0)	0.98 (1.0 – 1.0)
White					
Black	1.10 (0.6 – 1.9)	1.86 (0.9 – 3.8)	1.05 (0.4 – 3.0)	0.83 (0.5 – 1.4)	0.52 (0.2 – 1.2)
Coloured	1.43 (0.8 – 2.5)	1.59 (0.8 – 3.4)	1.06 (0.4 – 2.9)	1.47 (0.8 – 2.7)	0.56 (0.2 – 1.7)
Indian	0.93 (0.5 – 1.8)	1.00 (0.4 – 2.6)	1.50 (0.4 – 5.1)	0.31 (0.1 – 1.0)*	0.44 (0.1 – 1.3)
Log of income	1.03 (1.0 – 1.1)	1.05 (1.0 – 1.1)	1.00 (0.9 – 1.1)	1.00 (0.9 – 1.1)	1.20 (1.0 – 1.4)*
Married	0.76 (0.6 – 0.9)**	0.80 (0.6 – 1.0)*	0.81 (0.6 – 1.0)	0.69 (0.5 – 0.9)**	0.71 (0.4 – 1.2)
Years of education	0.99 (1.0 – 1.0)	0.99 (1.0 – 1.0)	0.94 (0.9 – 1.0)**	1.02 (1.0 – 1.1)	0.90 (0.8 – 1.0)*
Employed	1.10 (0.9 – 1.3)	0.77 (0.6 – 1.0)*	1.07 (0.7 – 1.5)	1.22 (0.9 – 1.6)	1.16 (0.8 – 1.8)
Urban	1.09 (0.9 – 1.4)	1.36 (1.1 – 1.7)**	1.11 (0.8 – 1.5)	1.00 (0.7 – 1.4)	2.21 (1.2 – 4.1)**
Other assets	1.01 (1.0 – 1.0)	1.01 (1.0 – 1.0)	1.04 (1.0 – 1.1)	1.01 (1.0 – 1.0)	1.08 (1.0 – 1.1)**
Wealth					
Debt	0.88 (0.7 – 1.1)	0.85 (0.6 – 1.2)	1.12 (0.8 – 1.5)	0.79 (0.5 – 1.1)	1.74 (1.0 – 3.2)
Wealth UK/Rf/miss	0.62 (0.5 – 0.8)***	0.67 (0.5 – 0.9)**	0.74 (0.5 – 1.0)	0.63 (0.4 – 0.9)**	0.74 (0.4 – 1.3)
Global life events	1.17 (1.1 – 1.2)***	1.11 (1.0 – 1.2)***	1.16 (1.1 – 1.2)***	1.17 (1.1 – 1.2)***	1.03 (0.9 – 1.2)
Relationship events	1.39 (1.2 – 1.6)***	1.51 (1.3 – 1.8)***	1.12 (0.9 – 1.4)	1.31 (1.1 – 1.6)**	1.56 (1.1 – 2.1)**
Perpetrator scale	1.22 (1.1 – 1.4)***	1.02 (0.8 – 1.3)	1.21 (1.0 – 1.5)	1.33 (1.0 – 1.8)*	1.14 (0.7 – 1.8)
Victim scale	1.21 (1.0 – 1.4)**	1.22 (1.0 – 1.5)	1.12 (0.9 – 1.4)	1.13 (0.9 – 1.4)	1.30 (0.8 – 2.1)
Social strain	0.97 (0.9 – 1.0)	0.99 (0.9 – 1.1)	1.01 (0.9 – 1.1)	1.03 (0.9 – 1.2)	0.96 (0.8 – 1.2)
Death of parent	1.65 (1.2 – 2.2)***	1.16 (0.8 – 1.6)	1.63 (1.2 – 2.3)**	1.58 (1.0 – 2.4)*	1.09 (0.3 – 3.7)
Divorce of parents	1.18 (0.9 – 1.6)	1.35 (0.9 – 2.1)	0.69 (0.4 – 1.3)	1.03 (0.6 – 1.7)	0.84 (0.4 – 2.0)
Away from parent	1.31 (1.0 – 1.8)	1.21 (0.8 – 1.8)	1.73 (1.2 – 2.4)**	1.22 (0.8 – 1.8)	1.42 (0.6 – 3.6)
MHH employed					
MHH unemployed	1.18 (0.9 – 1.5)	1.02 (0.7 – 1.4)	0.99 (0.7 – 1.4)	1.12 (0.7 – 1.7)	2.68 (1.4 – 5.1)**

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Variables	Any DSM-IV disorder	Anxiety disorder	Mood disorder	Substance disorder	Impulse disorder
MHH employed UK/Rf	0.76 (0.6 – 1.0)*	0.85 (0.6 – 1.2)	0.59 (0.4 – 0.8)***	0.82 (0.6 – 1.1)	1.08 (0.4 – 3.0)
FHH employed					
FHH unemployed	0.93 (0.7 – 1.2)	0.91 (0.7 – 1.2)	0.79 (0.5 – 1.2)	1.07 (0.7 – 1.6)	1.15 (0.5 – 2.4)
FHH employed UK/Rf	1.13 (0.8 – 1.5)	1.12 (0.8 – 1.6)	1.17 (0.8 – 1.8)	1.37 (0.9 – 2.1)	0.62 (0.2 – 1.7)

* $p \leq 0.05$.

** $p \leq 0.01$.

*** $p \leq 0.001$.

MHH = male head of household; FHH = female head of household; UK = unknown; Rf = refused to answer.