Objectives: Severe life events are established as provoking agents for depression in combination with vulnerability factors. Identifying features of severe events improves the prediction of disorder but are rarely utilised, mainly because life events research is increasingly dominated by self-report checklists with no capacity for inferring such characteristics. This paper investigates the association of severe life events' features with depression and insecure attachment styles using a new online measure of life events in a clinical and control sample.

Methods: 202 participants (75 clinical, 127 matched control participants) taken from an earlier national Depression and Case Control genetic study and followed up after 12-years, completed the Computerised Life Events Assessment Record to assess characteristics of life events, the Vulnerable Attachment Style Questionnaire to measure attachment insecurity, and the General Health Questionnaire to measure depression.

Results: The clinical group had higher self-reported depression, severe life events and insecure attachment style. They also reported more loss, danger, humiliation, and trauma severe events. Intra-respondent analysis showed individuals experiencing these types of events were more likely to report depression. Insecure attachment style and severe life events were both significantly related to recent depression and history of depressive disorder. Anxious attachment style was significantly related to relationship events and bereavements, as well as severe loss or humiliation events whereas avoidant style was not.

Conclusions: Identifying salient features of severe life events improves associations with depression and insecure attachment style. Utilising a new online approach can aid research and clinical approaches for depression at low cost.

Practitioner Points

- Salient features of severe life events (e.g. loss, humiliation) give insight into the potential impact on attachment vulnerability and depression.

- Clinicians and researchers can use online methods to economically gain detailed life event information needed for clinical formulation and valid data on stressors.

- The self-reported scale for recent depression is only a proxy measure of clinical disorder but the clinical group selection is a more robust criterion for depression history.

Introduction

Understanding major depression onsets requires operationalising a stress model in terms of severe life events (G. W. Brown & Harris, 1978; Hillegers et al., 2004; Kessler, 1997) and their interaction with personal vulnerability, such as insecure attachment style (Abdul Kadir & Bifulco, 2013; Bifulco, Moran, Ball, & Bernazzani, 2002). Models of attachment develop in infancy based on interactions between the child and their care-givers. This leads to an 'internal working model' of relationships (Bowlby, 1988). Insecure attachment style not only impacts the manner in which an individual relates to others, but also incorporates other social and cognitive factors. Therefore, it encompasses many aspects of psychosocial vulnerability, such as cognitive styles characterised by hopelessness or low self-esteem (Fuhr, Reitenbach, Kraemera, Hautzinger, & Meyer, 2017; Lavy & Littman-Ovadia, 2011), or lacking social support and having poor quality relationships (Abdul Kadir & Bifulco, 2013). These factors decrease resilience in the face of severe stressors. Indeed, insecure attachment is a risk factor for developing depression (Bifulco, Mahon, Kwon, Moran, & Jacobs, 2003; Bifulco, Moran, Ball, & Lillie, 2002) and some insecure attachment styles are over-represented in individuals with depression (Murphy & Bates, 2000).

Furthermore, specific insecure attachment styles are characterised by different patterns of behaviour. Anxiously attached individuals demonstrate low self-reliance, intolerance of separation, and fearful behaviours, whereas avoidantly attached individuals have elements of mistrust, constraints on closeness, and sometimes anger in their relationships (Bifulco & Thomas, 2012). These behavioural vulnerabilities may represent greater susceptibility to different features of environmental stress. For example, those with anxious attachment style may find events with a large degree of humiliation particularly painful due to their sensitivity to rejection.

Combining the approaches of diathesis stress models involving life events and models of attachment are thought to provide a more constructive model of understanding depression (Bifulco & Thomas, 2012). However, such models are weakened when the distinction between objective events and the perception of events is blurred, which can happen in both research and clinical practice (Harkness & Monroe, 2016), as subjective reporting may exaggerate or underplay the impact of any given event depending on an individual's reporting style. Yet objective (or contextual) estimates of life events can be reliably made (G. W. Brown & Harris, 1978) and these can aid understanding and prediction as well as differentiate disorder responses (Kendler, Hettema, Butera, Gardner, & Prescott, 2003).

Many psychological treatments include problem solving approaches for managing life change and events; including those with Beckian (Beck, 1967) reference to impacts on the self, the view of the world, and the future in relation to mood disorders (Power, 2013) and trauma (Brewin, 2001). Research that can illuminate the objective characteristics of severe events that are most predictive of depression or other emotional disorder, examined together with relational characteristics that make an individual vulnerable, can be an aid to clinical practice by encouraging more targeted treatment and intervention.

Much of the seminal research work on life events was undertaken in the 1970s-90s where intensive measurement (e.g. Life Events and Difficulties Schedule LEDS; (G. W. Brown & Harris, 1978) and use of narrative data allowed for the exploration of life event features for greater prediction of depression. Whilst there were some significant linkages to event categories (e.g. bereavements and relationship events), better prediction and specificity arose from identifying cross-category features, such as loss or danger (G.W. Brown, Bifulco, &

Harris, 1987) and humiliation or entrapment (G. W. Brown, Harris, & Hepworth, 1995).

However, there has been relatively little exploration of these factors in recent years, apart

from in genetic research (Eley & Stevenson, 2000; S M Monroe & Reid, 2008; Risch et al.,

2009) or in research exploring related disorders such as bipolar disorder (Hosang, Uher,

Maugham, McGuffin, & Farmer, 2012).

This is in part due to the paucity of measurement – intensive measures are required for such

detailed assessment of life events. Yet following from the influential Social Adjustment Scale

from the 1960s (Holmes & Rahe, 1967) much life event research utilises checklists which

mainly focus on event category (e.g. health, education, housing, partnership) with weightings

for likely negativity. Other scales have been developed based on selecting likely categories of

severe event from more intensive assessment (Brugha, Bebbington, Tennant, & Hurry, 1985).

This approach tends towards a sum of events, the higher the sum the greater the likelihood of

depression. A more specific model argues that certain types of events, such as loss events,

have more potential for triggering onset of depression, even if they occur alone (G. W. Brown

et al., 1995).

These attributes can occur across event categories – one can lose a close relative, a job or a

home (Scott M. Monroe & Roberts, 1990). Loss and bereavement have long had theoretical

links to depression and investigation still continues (Bonanno, 2004; S. M. Monroe, Rohde,

Seeley, & Lewinsohn, 1999; Sikorski et al., 2014) with attachment themes evident.

Researchers and clinicians need to consider such category-crossing features, adopting a more

dimensional approach, not least because specific categories are not common across

populations in a short time-span. The point to be made is that life event assessment need not

be limited to scales of negativity/severity and domain classification but can also include more

subtle features implying their psychological effects such as danger (threat of future loss), loss, and humiliation. Making objective assessments of event characteristics can aid researchers in further specifying depression models, but also clinicians assessing event impacts around therapeutic themes.

For the present study, the Computerised Life Events Assessment Record (CLEAR; (Spence et al., 2015) was utilised. This is a new online self-report measure of life events, which takes a more intensive and detailed approach to assessing life events than check-list approaches. It utilises a lengthy classification scale, records timing of events, and measures the contextual threat/unpleasantness of each event. It also identifies the individuals involved and whether particular event characteristics such as loss and humiliation are present. It has good reliability and validity, including its ability to predict depression in the presence of severe life events (Bifulco et al., 2019). Through the use of CLEAR, this study sought to test features and types of severe life events in relation to both recent and past depression in a midlife clinical and control sample. Insecure attachment style was also examined in relation both to characteristics of severe life events and to depression.

Hypotheses

Group analysis:

1. The clinical group will experience significantly more severe life events and be more likely to have recent depression and an insecure attachment style than the control group.

2. Severe event features (e.g. loss, danger, trauma) and relationship events will be rated more frequently in the clinical group.

Intra-respondent analysis:

3. Insecure attachment style, particularly anxious style, will positively relate to recent depression.

4. Insecure attachment style will positively relate to severe life events and events with features of loss and humiliation.

5. The presence of at least one severe life event and an insecure attachment style will be positively associated with recent depression, with an interaction expected.

Methods

Sample

The sample comprised a twelve-year follow-up of a previously studied midlife Depression and Case Control (DeCC) white British sample: 127 DeCC control group participants and 75 DeCC clinical group participants (mean age 57.6, SD = 7.8, range = 36-75). There were more females overall and due to the original study's genetic sampling procedures the participants were all Caucasian (see Table 1). In the original genetic study of depression (Korszun et al., 2004), depressed patients were identified from psychiatric clinics, hospitals, general medical practitioner surgeries, and media advertisements, and had experienced 2 or more episodes of unipolar depression as defined by the Diagnostic and Statistical Manual 4th edition operational criteria (DSM-IV; American Psychiatric Association, 1994) or the International Classification of Diseases 10th edition operational criteria (ICD-10; (WHO, 1993) for unipolar depression following a face-to-face clinical interview.

Electoral rolls and death records were checked to obtain current contact details and remove those who were deceased. Invitation letters were sent to the remaining 511 depression cases and 587 control participants whose addresses were known. (The main study also included a student group which is reported elsewhere (see Bifulco et al., 2019 for details)). There were

142 letters returned confirming the participant as not known at that address. However, it is not known to what extent this reflects the actual number of participants who had moved over the 12-year follow-up period and reasons for non-participation could not be ascertained e.g. not receiving the invitation vs. not wanting to take part.

Measures

Computerised Life Events Assessment Record (CLEAR; (Bifulco et al., 2019)

This is a new online platform designed to provide a very detailed measure of life events and long term problems that have occurred over the previous year (Bifulco et al., 2019; Spence et al., 2015). The measure assesses 12 life event domains (e.g. education, work, health); time taken to complete CLEAR depends somewhat on the number of events experienced over the prior 12-month period but generally it can be completed within an hour. Severity of life events are rated on a five-point scale and participants are guided by videos and written instruction on how to rate objective threat for an event. Previous analysis shows test-retest reliability for severe life events is satisfactory (K = .60, $p < .001$), with good predictive validity for depression (OR = 3.50; 95% CI 2.10-5.85; $P<.001$) (Bifulco et al., 2019). Comparison with interview-based assessment shows satisfactory validity for severe life events.

The following derived indices are utilised:
- **Severe life events** – rated on a 5-point scale of threat/unpleasantness, events rated 1:'Extremely', 2:'Very' or 3:'Moderately', focused on self or jointly with other, and not illness-related (e.g. suicide attempt or clinical treatment) were considered severe.
- **Severe life events – higher threat**. As above but rated 1:'Extremely' or 2:'Very' on scale of threat/unpleasantness. The '3-moderate' score is quite wide, and events can

sometimes reach moderately severe thresholds due to the amount of negative change involved, without necessarily containing a large emotional impact from more destructive implications. Therefore, this higher threshold was also used to capture severe events which had the greatest likelihood of involving emotionally damaging consequences in line with prior research (G.W. Brown et al., 1987).

- **Non-relationship severe events** – those severe events occurring in education, work, health and fertility, finance, housing, crime or geo-political domains. Any one counted as 'present' versus 'absent'.

- **Relationship severe events** – those severe events occurring in partner, child or other relationship categories. Any one counted as 'present' versus 'absent'.

- **Bereavement events** – deaths of partner, parents, close friends or children.

Features of severe life events assessed subjectively online (present or absent) included:

- **Loss** (e.g. person/valued object): where any aspect involving having lost a relationship, a job, a role, could be included.

- **Threat of future loss: danger events** (e.g. news of redundancy or threat through violence).

- **Humiliation/rejection**: experiences involving overt rejection or public shaming.

- **Trauma or attack**: threat to life or safety; violence events.

- **Goal frustration:** failure in achieving a goal in an area of high commitment and planning (e.g. education success, work advancement, fertility treatment etc.).

General Health Questionnaire (GHQ-12; (Goldberg et al., 1997)

The GHQ-12 is a 12-item self-report questionnaire of depression. Each item is rated on a scale of 1-4 (e.g. 'better than usual' to 'much less than usual') with half being positively

worded and the other half negatively worded. Response categories are dichotomised and given a rating of '1' if either of the two most frequent symptom responses were endorsed or '0' if either of the two least frequent symptom responses were endorsed. Studies have shown different optimal cut-offs by older age (Papassotiropoulos, Heun, & Maier, 1997) and sample (Lundin, Hallgren, Theobald, Hellgren, & Torgén, 2016). A cut-off score of 5 or more (Zulkefly & Rozumah Baharudin, 2010) was taken to indicate the presence of a depressive episode during the current study period and yielded higher specificity (92%) than sensitivity (45%) for determining the clinical group with 77% positive predictive value and 74% negative predictive value. Participants were directed to rate each question looking back over the past two weeks and the worst point in the past 12 months.

Vulnerable Attachment Style Questionnaire (VASQ; (Bifulco et al., 2003)

This is a 22-item self-report Likert scale which queries about attitudes to closeness, autonomy, and fear or anger in relating styles. It yields a total score of insecurity (cut off 57 for dichotomous analyses); a score for avoidant style (cut off 30), and a score of anxious style (cut off 27). It has good reliability, is validated against an attachment interview (ASI; (Bifulco, Moran, Ball, & Bernazzani, 2002) and previous analyses show a significant relationship with depression (Bifulco et al., 2003).

Analysis

Data cleaning procedures were minimal as responses on CLEAR are constrained to some degree at the time of entry (e.g. dates can only be entered in a particular format, important missing values need to be entered before the individual can move on) and stored automatically in an encrypted database. The data was then downloaded using MySQL and variables created using a pre-programmed Python programming script. Where missing values

remained, pairwise deletion was used. Chi square analyses were utilised with dichotomised variables for group comparisons (clinical versus control) and intra-respondent analysis. Odds ratios (OR) with confidence intervals (CI) were utilised for characteristics of severe life events and depression or attachment style. Binary logistic regression was used to test a model of severe life event and insecure attachment style and depression with group membership as a control variable.

<div align="center">

Results

</div>

Sample demographics

The control group was slightly younger than the clinical group (mean age 56.94; SD = 7.09; range 36-67 vs. mean age 58.69; SD = 8.98; range 39-75) but this difference was not significant. However, significantly more of the control group than clinical group were male, in employment, and had partners and children (see Table 1).

<div align="center">

Table 1 about here

</div>

Prevalence of risks by group

Table 2 shows risk characteristics by group. The clinical group had significantly higher recent GHQ-rated depression (score of 5 or more), severe life events (both higher and lower thresholds of severity), non-relationship events and bereavements and higher rates of severe events involving loss, threat of loss (danger), humiliation, and trauma. However, goal frustration and relationship events were unrelated to group. The clinical group also had higher rates of insecure attachment, including both anxious and avoidant styles.

<div align="center">

Table 2 about here

</div>

Events, attachment and GHQ 12-month depression

Table 3 shows an intra-respondent analysis of events by GHQ-rated depression. Odds ratios of the associations between life events and attachment style with recent depression are shown for dichotomised variables. All factors were significantly related. The highest odds ratios for

recent depression were for any severe event (higher threat) (OR=6.72), humiliation events (OR=6.38), and trauma events (OR=5.83).

<div align="center">**Table 3 about here**</div>

Attachment style and life events

Event characteristics were examined by type of insecure attachment style, using dichotomised scores (see Table 4). Most factors were unrelated to avoidant style, the exception being any severe event (higher threshold). However, most did relate to anxious style including both lower and higher threshold severe events, relationship events, and bereavement events together with loss and humiliation events. There was no relationship to danger events, goal frustration events, or trauma events (see Table 4).

<div align="center">**Table 4 about here**</div>

Model of depression

Severe life events (higher threshold selected given higher association with depression) and overall insecure attachment style were examined in relation to depression using binary logistic regression. Study group was added as a control factor (Table 5). It can be seen that both severe event and attachment insecurity added significantly to the model as main effects. However, study group also added, implying either history of depression or some other longer-term vulnerability factor added to risk. An interaction between severe life events and insecure attachment style was non-significant (p=.053).

<div align="center">**Table 5 about here**</div>

Discussion

The study used a new online assessment of life events to explore those differentiating a clinical and control group and those related to 12-month GHQ-rated depression (score of 5 or more). The prior-determined clinical group had significantly higher rates of severe life events, non-relationship events, and bereavement events and those involving loss, danger,

humiliation, and trauma. As indicated by previous research (G.W. Brown et al., 1987; G. W. Brown et al., 1995), these event types were also significantly related to 12-month depression in an intra-respondent analysis. Insecure attachment style and the presence of a severe life event were associated with recent depression, with clinical group status adding to the model. Whilst interactions are expected for vulnerability factors in conjunction with severe life events, in practice such interactions do not always emerge statistically (George W Brown, 1986). Additionally, vulnerability factors need to be shown as predating the severe event provoking disorder (G. W. Brown, Andrews, Bifulco, & Veiel, 1990). In this analysis the factors were measured concurrently and the statistical interaction term fell just short of $p<.05$. This may have been due to the relatively small numbers involved (Altmann, Gore, Gardner, & Pocock, 1983).

Insecure attachment style (anxious and avoidant) was more common in the clinical group and both styles related to depression over the past year. However, measuring life events in detail allows for more varied analysis of event type to depression and to vulnerability. Indeed, whilst severe events related to both avoidant and anxious styles; relationship events, trauma events, and loss and humiliation events were significantly related only to anxious style. In this way, more sophisticated measurement enables some notion of matching; severe events involving relationships and characteristics of negativity in relationships related to vulnerability around anxious attachment style. Further research would help explore whether this may reflect a heightened sensitivity, and therefore greater reporting, or whether it indicates that anxiously attached individuals experience a greater number of these event types.

Previous publications have noted the lower validity of check-lists of life events and their lower prediction of depression (Bifulco et al., 2019; Donoghue, Traviss-Turner, House, Lewis, & Gilbody, 2016). More intensive measures allow for exploration of event features, mining each severe event for characteristics which can be damaging to individuals such as loss, threatened loss (danger), and humiliation. These features show increased rates of depression, as well as relating to insecurity of attachment indicating where harm to individuals occur.

Whilst prior research in this tradition has involved interview methods, this is the first to mimic such measures online. This provides a more cost-effective approach for research by reducing the need for training and time taken in data entry and cleaning. Furthermore, it allows multiple participants to complete the measure simultaneously and across large geographical areas. Clinically, it could be used in conjunction with clinical interviews to help clients think about their recent experiences and provide clinicians with a report to help inform their assessments and target interventions by highlighting problem areas or recent patterns of stressors. CLEAR[1] could also be used to aid referrals to appropriate services (e.g. work problems to employment-related agencies) or be used in tandem with digital health interventions for those with milder problems or whilst on waiting lists.

CLEAR has been previously shown to be superior to check-list life event measures in predicting depression (Bifulco et al., 2019), and its ability to measure features of events is here shown to increase the theoretical and clinical value of using more sophisticated forms of life events measurement. Whilst online approaches are also reliant on self-report, the greater

---

[1] Contact first author for details of access to CLEAR.

detail involved, the inclusion of rating video instruction, and the ability to score a type of event more than once, allow for a more nuanced approach.

Study limitations include the cross-sectional nature of the study whereby time order of risk factors and depression does not allow causality to be inferred and the white ethnic homogeneity of the sample which reduces generalisability. Furthermore, using a symptom scale rather than a clinical interview for depression is an imprecise indicator of disorder. Also the non-exact matching of clinical and control groups due to attrition over the 12-year follow-up period since selection means that demographic differences found between groups (such as being partnered and having children) may partially account for the relationships between the risk factors and study group (Table 2) and help to explain the significant relationship between group membership and GHQ-rated depression (Table 5).

Researchers and clinicians can be encouraged to think more carefully about life events and crises which provoke depression, in terms of the characteristics of such events and how this can impact on cognitive-emotional functioning. Having a detailed and more theoretically-informed classification of such experience can aid with interpretations and therapeutic themes to address when explaining different outcomes. Having an online system allows for a more cost-effective way of incorporating such assessment into more complex research designs and daily clinical practice to benefit patients.

References

Abdul Kadir, N., & Bifulco, A. (2013). Insecure attachment style as a vulnerability factor for

   depression: Recent findings in a community-based study of Malay single and married

   mothers. *Psychiatry Research, 210*, 919-924.

Altmann, D., G.,, Gore, S., M.,, Gardner, M., J.,, & Pocock, S., J. (1983). Statistical guidelines for

   contributors to medical journals. *British Medical Journal, 286*.

Beck, A. T. (1967). *Depression: clinical, experimental and theoretical perspectives.* New York: Hoeber.

Bifulco, A., Mahon, J., Kwon, J.-H., Moran, P., & Jacobs, C. (2003). The Vulnerable Attachment Style

   Questionnaire (VASQ): An interview-derived measure of attachment styles that predict

   depressive disorder. *Psychological Medicine, 33*, 1099-1110.

   doi:10.1017/S0033291703008237

Bifulco, A., Moran, P. M., Ball, C., & Bernazzani, O. (2002). Adult attachment style. I:Its relationship

   to clinical depression. *Social Psychiatry & Psychiatric Epidemiology, 37*, 50-59.

   doi:10.1007/s127-002-8215-0

Bifulco, A., Moran, P. M., Ball, C., & Lillie, A. (2002). Adult attachment style. II: Its relationship to

   psychosocial depressive-vulnerability. *Social Psychiatry & Psychiatric Epidemiology, 37*, 60-

   67. doi:10.1007/s127-002-8216-x

Bifulco, A., Spence, R., Nunn, S., Kagan, L., Rodriguez D., Hosang G.M., . . . Fisher, H. L. (2019). The

   Computerised Life Events and Assessment Record (CLEAR) online measure of life events:

   reliability, validity and association with depression. *JMIR Mental health, 6*(1), e10675.

   doi:10.2196/10675

Bifulco, A., & Thomas, G. (2012). *Understanding adult attachment in family relationships: Research,

   assessment and intervention*. London: Routledge.

Bonanno, G. A. (2004). Loss, Trauma and Human Resilience: have we underestimated the human

   capacity to thrive after extremely aversive events? *American Psychologist, 59*(1), 20-28.

Brewin, C. R. (2001). Cognitive and emotional reactions to traumatic events: Implications for short-term intervention. . *Advances in Mind-Body Medicine,, 17*(3), 163-168.

Brown, G. W. (1986). Statistical interaction and the role of social factors in the aetiology of clinical depression. *Sociology., 20*, 601-606.

Brown, G. W., Andrews, B., Bifulco, A. T., & Veiel, H. O. (1990). Self esteem and depression: I. Measurement issues and prediction of onset. *Social Psychiatry and Psychiatric Epidemiology., 25*, 200-209.

Brown, G. W., Bifulco, A., & Harris, T. (1987). Life events, vulnerability and onset of depression: Some refinements. *British Journal of Psychiatry., 150*, 30-42. doi:10.1192/bjp.150.1.30

Brown, G. W., & Harris, T. O. (1978). *Social Origins of Depression: A study of psychiatric disorder in women.* London, New York: Tavistock.

Brown, G. W., Harris, T. O., & Hepworth, C. (1995). Loss, humiliation and entrapment among women developing depression: A patient and non-patient comparison. *Psychological Medicine., 25*, 7-21. doi:10.1017/S003329170002804X

Brugha, T., Bebbington, P., Tennant, C., & Hurry, J. (1985). The List of Threatening Experiences: A subset of 12 life event categories with considerable long-term contextual threat. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences, Vol 15(1)*(Feb 1985), 189-194.

Eley, T. C., & Stevenson, J. (2000). Specific life events and chronic experiences differentially associated with depression and anxiety in young twins. *Journal of Abnormal Child Psychology, 28*(4), 383-394.

Fuhr, K., Reitenbach, I., Kraemera, J., Hautzinger, M., & Meyer, T. D. (2017). Attachment, dysfunctional attitudes, self-esteem, and association to depressive symptoms in patients with mood disorders. *Journal of Affective Disorders, 212*(1), 110-111. doi:https://doi.org/10.1016/j.jad.2017.01.021

Goldberg, D., Gater, R., Sartorius, N., Ustun, T. B., Piccinelli, M., Gurege, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine, 27*, 191-197.

Harkness, K. L., & Monroe, S. M. (2016). The Assessment and Measurement of Adult Life Stress: Basic Premises, Operational Principles, and Design Requirements. *Journal of Abnormal Psychology, 125*(5), 727–745. doi:10.1037/abn0000178

Hillegers, M. H., Burger, H., Wals, M., Reichart, C. G., Verhulst, F. C., Nolen, W. A., & Ormel, J. (2004). Impact of stressful life events, familial loading and their interaction on the onset of mood disorders: study in a high-risk cohort of adolescent offspring of parents with bipolar disorder. . *Br J Psychiatry, 185*, 97-101. doi:10.1192/bjp.185.2.97

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic research, 11*(2), 213–218 doi:10.1016/0022-3999(67)90010-4

Hosang, G. M., Uher, R., Maugham, B., McGuffin, P., & Farmer, A. (2012). The role of loss and danger events in symptom exacerbation in bipolar disorder. *Journal of Psychiatric Research, 46*(12), 1584-1589. doi:10.1016/j.jpsychires.2012.07.009

Kendler, K. S., Hettema, J. M., Butera, F., Gardner, C. O., & Prescott, C. A. (2003). Life Event Dimensions of Loss, Humiliation, Entrapment, and Danger in the Prediction of Onsets of Major Depression and Generalized Anxiety. . *Arch Gen Psychiatry, 60*(8), 789–796. doi:10.1001/archpsyc.60.8.789

Kessler, R. C. (1997). The effects of stressful life events on depression. *Annual Review of Psychology, 48*, 191-214.

Korszun, A., Moskvina, V., Brewster, S., Craddock, N., Ferrero, F., Gil, l. M., . . . Farmer, A. (2004). Familiarity of symptom dimensions in depression. . *Arch Gen Psychiatry, 61*, 468–474. doi:10.1001/archpsyc.61.5.468

Lavy, S., & Littman-Ovadia, H. (2011). All you need is love? Strengths mediate the negative

associations between attachment orientations and life satisfaction. *Personality and

Individual Differences, 50*(7), 1050-1055. doi:https://doi.org/10.1016/j.paid.2011.01.023

Lundin, A., Hallgren, M., Theobald, H., Hellgren, C., & Torgén, M. (2016). Validity of the 12-item

version of the General Health Questionnaire in detecting depression in the general

population. *Public Health, 136*, 66-74. doi:10.1016/j.puhe.2016.03.005

Monroe, S. M., & Reid, M. (2008). Gene-environment interactions in depression research: genetic

polymorphisms and life-stress procedures. *Psychological Science, 19 (10)*, 947-956.

Monroe, S. M., & Roberts, J. E. (1990). Conceptualizing and measuring life stress: Problems,

principles, procedures, progress. *Stress and Health, Volume 6*(3), 209-216.

doi:10.1002/smi.2460060306

Monroe, S. M., Rohde, P., Seeley, J. R., & Lewinsohn, P. M. (1999). Life events and depression in

adolescence: Relationship loss as a prospective risk factor for first onset of major depressive

disorder. *Journal of Abnormal Psychology, 108*(4), 606-614.

Murphy, B., & Bates, G. W. (2000). Adult attachment style and vulnerability to depression.

Personality and Individual Differences, 22(6), 835-844.

Papassotiropoulos, A., Heun, R., & Maier, W. (1997). Age and cognitive impairment influence the

performance of the General Health Questionnaire. . *Compr Psychiatry., 38*, 335–340.

doi:10.1016/S0010-440X(97)90929-9

Power, M. (2013). *The Wiley-Blackwell Handbook of Mood Disorders, Second Edition*: John Wily &

Sons.

Risch, N., Herrell, R., Lehner, T., Liang, K.-Y., Eaves, L., Hoh, J., . . . Ries Merikangas, K. (2009).

Interaction Between the SerotoninTransporter Gene (5-HTTLPR), Stressful Life Events, and

Risk of Depression: A Meta-analysis. *JAMA, 301*(23), 2462-2471.

Sikorski, C., Luppa, M., Heser, K., Ernst, A., Lange, C., Werle, J., . . . Riedel-Heller, S. G. (2014). The

role of spousal loss in the development of depressive symptoms in the elderly —

Implications for diagnostic systems. *Journal of Affective Disorders, 161*, 97-103.

doi:https://doi.org/10.1016/j.jad.2014.02.033

Spence, R., Bunn, A., Nunn, S., Hosang, G. M., Kagan, L., Fisher, H. L., . . . Bifulco, A. (2015).

Measuring Life Events and Their Association With Clinical Disorder: A Protocol for

Development of an Online Approach. *JMIR Res Protoc, 4*(3), e83. doi:10.2196/resprot.4085

WHO. (1993). *The ICD-10 Classification of Mental and Behavioural Disorders Diagnostic Criteria for*

Research. . Retrieved from Geneva:

Zulkefly, N. S., & Rozumah Baharudin, R. (2010). Using the 12-item General Health Questionnaire

(GHQ-12) to Assess the Psychological Health of Malaysian College Students. *Global Journal of*

Health Science, 2(1).

Table 1: Sample demographic characteristics

Characteristic	Total Sample (N = 202) n (%)	Control Group (N = 127) n (%)	Clinical Group (N = 75) n (%)	χ^2, p value
Female gender	122 (60.4)	70 (55.1)	52 (69.3)	3.98, p=.046
Has partner	167 (82.7)	113 (89.0)	54 (72.0)	9.49, p=.002
Has children	164 (81.2)	110 (86.6)	54 (72.0)	6.59, p=.010
Employed	125 (61.9)	91 (71.7)	34 (45.3)	13.85, p<.001
Homeowner (incl. with mortgage)	173 (90.6)	113 (92.6)	60 (87.0)	5.72, p=.126
Degree-level education	103 (51.0)	66 (52.0)	37 (49.3)	.07, p=.790

Table 2: Risks by study group

Risk factor	Clinical Group (N=75) n (%)	Control Group (N=127) n (%)	Total (N=202) n (%)	χ^2, p value
GHQ 12-month depression (score of 5 or more)	33 (45)	10 (8)	43 (22)	37.52, p<.001
Severe event (higher 1-2 threat)	26 (35)	10 (8)	36 (18)	23.11, p<.001
Severe event (lower1-3 threat)	41 (55)	43 (34)	84 (42)	8.40, p=.005
Non-relationship event	37 (51)	36 (28)	73 (36)	8.99, p=.003
Relationship event	9 (12)	10 (8)	19 (10)	0.942, p=.332
Bereavement event	10 (14)	6 (5)	16 (8)	4.79, p=.029
FEATURE OF EVENT				
Loss event	22 (29)	16 (13)	38 (19)	8.65, p=.003
Danger event	20 (27)	15 (12)	35 (18)	7.27, p=.007
Humiliation event	20 (27)	8 (6)	28 (14)	16.38, p<.001
Goal frustration event	13 (17)	19 (15)	32 (16)	0.199, p=.655
Trauma event	11 (15)	2 (2)	13 (7)	13.42, p<.001
VULNERABILITY				
Attachment insecurity	57 (42)	23 (29)	36 (71)	23.55, p<.001
Anxious attachment style	55 (41)	31 (39)	40 (80)	11.90, p<.001
Avoidant attachment style	64 (73)	21 (26)	50 (99)	37.45, p<.001

GHQ, General Health Questionnaire.

Table 3: Associations between characteristics of life events, attachment style, and recent depression

Risk factor	OR for depression	95% CI	P value
Severe life event (lower)	3.59	1.70-7.30	<.001
Severe life event (higher)	6.72	3.00-15.00	<.001
Non-relationship event	2.99	1.49-5.98	.002
Relationship severe event	2.99	1.12-7.99	.029
Bereavement event	2.35	0.80-6.88	.119
FEATURE OF EVENT			
Loss severe event	3.78	1.70-8.10	<.001
Danger severe event	4.81	2.10-10.68	<.001
Humiliation severe event	6.38	2.70-15.09	<.001
Goal frustration severe event	2.95	1.28-6.74	.011
Trauma severe event	5.83	1.75-19.44	.005
VULNERABILITY			
Attachment insecurity	4.68	2.27-9.65	<.001
Anxious attachment style	2.59	1.24-4.99	.008
Avoidant attachment style	2.69	1.34-5.41	.004

CI, confidence interval. OR, odds ratio. Note. Depression is the outcome and is dichotomised as 0=score less than 5, 1=score of 5 or more on the General Health Questionnaire.

Table 4: Associations between characteristics of severe life events and insecure attachment styles

Event category	Avoidant style OR (95% CI)	P value	Anxious style OR (95% CI)	P value
Any severe event (lower)	1.07 (.60-1.93)	.799	1.81 (1.03-3.22)	.042
Any severe event (higher)	3.04 (1.45-6.37)	.002	2.18 (1.05-4.53)	.033
Non-relationship event	1.04 (.57-1.90)	.882	1.42 (.79-2.55)	.151
Relationship severe event	1.02 (.38-2.73)	.960	6.75 (2.15-21.18)	<.001
Bereavement event	2.43 (.86-6.83)	.092	3.70 (1.23-10.43)	.020
EVENT FEATURE				
Loss severe event	1.64 (.80-3.37)	.180	2.04 (.99-4.19)	.053
Danger severe event	1.28 (.603-2.72)	.519	1.43 (.68-3.00)	.344
Humiliation severe event	1.48 (.65-3.36)	.347	2.50 (1.09-5.71)	.030
Goal frustration severe event	.77 (.76-.34)	.516	1.41 (.66-3.02)	.374
Trauma severe event	3.03 (.95-9.63)	.061	1.84 (.59-5.68)	.291

CI, confidence interval. OR, odds ratio.

Table 5: Logistic regression model of recent depression

	OR	Wald	d.f.	P value
Model 1				
Insecure attachment style	2.64	5.42	1	.020
Severe event (higher threshold)	3.68	7.88	1	.005
Study group membership	5.32	14.57	1	<.001
Model 2				
Insecure attachment style	1.59	.92	1	.338
Severe event (higher threshold)	1.22	.07	1	.799
Insecure attachment * severe event	7.37	3.75	1	.053
Study group membership	5.80	15.37	1	<.001

df, degrees of freedom. OR, odds ratio.