**Online stress project – method**

**Design**

*Participants*

CLEAR was tested on three groups of adults from two samples. All participants were over the age of 18 and provided either written or recorded consent to take part in the study prior to completing CLEAR. A second briefer consent form was provided at the start of CLEAR. Ethical approval was granted from Middlesex Psychology Department’s Ethics Committee and ISIS National Health Service ethics. All respondents were given £15 Amazon vouchers for each completion of CLEAR or interview.

*Depression and Case Control (DeCC) (n=202)*

This was a national mid-life sample originally studied at Kings College London for a UK multicentre case-control genetic association study of unipolar depression which was funded by the Medical Research Council [MRC] (Korszun et al., 2004). This sample was last utilised in 2007 and then comprised 598 healthy controls and 1236 individuals with recurrent depression, tested by use of clinical interview. Sampling procedures for the DeCC have been described elsewhere (Korszun et al., 2004). Permission was given to re-contact the DeCC participants from the sample holder (AF, co-I on the study) with participants having also given prior permission. Only postal addresses had been recorded. Given the time length a thorough search was made of death records from 2007 to delete appropriate names, as well as through social media to make contact and check change of address. One hundred and fourth-two contact letters were returned as not known at the address. All contacts were made initially by post and follow-up contact was largely through email.

In the current study letters with personal logons and the site address were sent out in waves of approximately 200 with a follow up letter/email a week later. In due course 127 controls and 75 cases were successfully recruited from the original sample. Around 50 respondents started CLEAR but did not complete and submit. This was equally distributed between case and control group and the timing suggests this was due mainly to difficulties with site loading experienced between May-July 2017. However, subsequent reminders did not lead to completion. Recruitment for the DeCC sample occurred from February 2015-Aug 2015 and November-December 2016.

Assistance was offered ona few occasions for those not computer-literate or with no access to broadband. A researcher went to visit the respondent with a laptop and aid in its completion. There was no notable difference in these responses when analysed.

*Student sample (n=129)*

Middlesex University Students (MUS) were recruited mainly from 1st year psychology students during presentations given post lecture and followed by an email containing a personal logon and site address. This yielded 120 (?) of a potential 290 year group. In addition, further participants were recruited from the psychology department by convenience sampling (n=9). Recruitment for the students took place between February-April 2015 and July-Oct 2015.

*Reliability subsample (n=60)*

The reliability subsample was taken from the main sample. Initially participants were sampled according to the number of life events entered into CLEAR to ensure a representative sample of life events frequency. After the first two rounds of recruitment any participant who completed the measure was sent a letter/email requesting completion of CLEAR for a second time. Test-retest reliability of CLEAR was undertaken using 20 participants from each of the three groups measured an optimal 3-4 weeks apart. Those with a larger time gap (n=5) were excluded.

*Validity subsample (n=30)*

In order to assess the validity of the new site, the LEDS interview was used on a sample of 30 participants looking at LEs and LTPs over the past 12 months prior to interview. The subsample comprised 10 students, 10 DeCC cases and 10 controls from the main sample. All completed CLEAR and the LEDS interview. Validity was counterbalanced with half the sample doing CLEAR or LEDS first. (Two participants failed to complete one of the methods). At interview all participants filled out the GHQ to control for possible effects of depression.

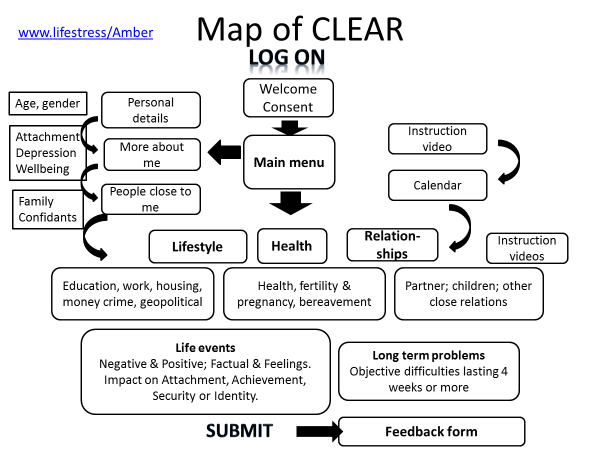
*Measures*

*New online system: CLEAR*

The CLEAR online system includes all life events and difficulties from the original LEDS face-to-face interview. As a general update from the 1980’s measure, CLEAR also comprises new events centred on technological advance (eg cyber-fraud) and geopolitical circumstances (eg asylum experience). Some of the original LEDS terminology was changed following panel feedback to enhance its lay user-friendliness e.g. ‘difficulties’ changed to to ‘long term problems’ (LTPs), ‘fertility’ to ‘pregnancy’ etc.

CLEAR layout consisted first of a welcome and consent page. The first substantive page consisted of three separate sections: demographics, additional questionnaires (vulnerability and wellbeing questionnaires were included but not discussed in the present analysis) and information about close others. Then LE and LTP domains and subdomains were listed and finally form submission with feedback. LEs and LTPs domains were subsumed under three overarching groups – ‘Lifestyle’, ‘Health’ and ‘Relationships’. ‘Lifestyle’ included education, work, housing, money, crime and geopolitical events. ‘Health’ included physical and mental illness, fertility and pregnancy and bereavement; ‘Relationships’ included partner, children and other close family or confidant relationships. Some demographics were located at the beginning of the measure but the rest captured throughout in relevant sections (For example work demographics would be first in the Work events section). Completion indicators are embedded at all main points and when completed personalised feedback is given on LEs and risk and resilience factors. Finally web based security was a key concern of the electronic CLEAR architecture and relevant security measures were put in place. Participants were given guidance through text boxes and videos as to how to rate LEs and LTPs as per the LEDS. For all events characteristics such as loss and danger were scored. Each LE and LTP had both open and closed response boxes to encourage both quantitative and qualitative data. Positive characteristics of life events were also rated, together with dimensions such as reconciliation, or anchoring.

Whilst the site was under construction, two panels provided feasibility feedback. The first was a lay panel of seven individuals, a mix of community and students with no specialist research knowledge. The second was the project’s International Advisory Board (IAB), an international group of eight experts in LEDS, who received a demonstration of CLEAR and provided feedback. The lay group were recruited to assess the usability, clarity and design of CLEAR by adding their own events. Experts were asked to complete CLEAR for complex event case histories. Both panels filled out CLEAR and were given a questionnaire to assess its usability. Following feedback, amendments were made and the research team worked with graphic designers to rebrand and modernise the website including adding professional videos and progress indicators. Following this, the site was considered ready for use.



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

This is a self-report symptoms questionnaire for depression which includes 6 positively worded and 6 negatively worded items rated on a scale of 1-4 (e.g. ‘more so than usual’ to ‘much less than usual’). Scoring assigned the two more frequent symptom responses (eg ‘much more than usual’ or ‘rather more than usual’) a score of ‘1’ and all lower ratings ‘0’. A score of 5 or more was taken to indicate likely clinical case depression consistent with published thresholds. Questions were added about the date of onset of symptoms and date of peak symptoms to indicate an approximate ‘onset’ of depression date.

*List of Threatening Experiences Questionnaire* LTEQ (Brugha & Cragg, 1990)

The LTE-Q comprised a list of 21 potentially significant life events to self, or close others. This had been validated against the LEDS and used extensively including on a previous contact with the DeCC sample. It yields a score of events (that have happened in 12 months) and a score of ‘whether it still affects me’.

*Life Events and Difficulties interview (validity subgroup only)*

The LEDS is an investigator-led semi-structured interview of life events and difficulties in adults (G. W. Brown & T. Harris, 1978). The interview includes extensive demographic information and covers ten life event domains: education, work, fertility, crime, housing, health, other relationships, partner and miscellaneous categories (including death, geopolitical events etc.). Information is collected on the event timing, surrounding context, who the event involves (focus) and other factors. Severity for life events is rated on a five-point scale from ‘1’ very to 5 ‘not at all’[[1]](#footnote-1) with higher points 1-3 (very marked, upper moderate and lower moderate) included in those severe. A *severe life event* in LEDS also takes into consideration to whom the event happened (*focus*) with a *severe event* occurring when the *focus* of the event is directed on the ‘self’ or ‘jointly’ with another close person. Severity of difficulties (renamed Long Term Problems LTP) was rated on a 1-4 scale with severe difficulty= 1-3 (very marked, marked and upper moderate) and non-severe difficulty=4 (lower moderate) consistent with the original. In the current study all interviews were rated and scorings checked by one of the original authors of the LEDS manuals (AB) blind to study group and depression. All queries were reconciled at a consensus meeting of three or more trained raters.

*Statistical analysis*

CLEAR data was downloaded from MySQL and transformed using Python. The format of the SPSS data was determined by the LEDS variables. Python enabled any derived variables to be generated via pre-coded algorithms based on prior LEDS analysis and all data was transferred directly into SPSS files. Data from CLEAR and the interviews were analysed using SPSS (v21). For reliability and validity all variables were tested using intra-class correlation (ICC) or kappa for dichotomous variables. Level of association was guided by Cohen’s accepted levels (Cohen, 1992). (Poor agreement = Less than 0.20; Fair agreement = 0.20 to 0.40; Moderate agreement = 0.40 to 0.60; Good agreement = 0.60 to 0.80 and Very good agreement = 0.80 to 1.00). Chi square analysis was used to examine SLEs in relation to depression.

1. The original scale was 4-point but supplemented by an additional scale of ‘a=upper or b=lower’ for those rated ‘moderate’ severity. These were subsumed into the adapted scale. [↑](#footnote-ref-1)