

Model-fitting suggests reciprocal causation and shared influences between depressive symptoms and negative life events

QUESTION

Question: What is the relationship between negative life events and depressive symptoms over time, using structural equation modelling?

People: In total 536 adult female twins (including 281 twin pairs; mean age 28 years, range 18–46 years). Zygosity was determined through sequential analysis of gender, fetal membranes, blood groups and DNA. For 81 twin pairs, zygosity was determined by self-report and maternal report and degree to which twins were confused for each other, and DNA if necessary.

Setting: Participants of an ongoing general population twin study; details not stated in this paper.

Risk factors: Women were asked to report on the occurrence of 61 events (list based on The Interview for Recent Life Events) during the past 6 months at baseline, and in the intervening period at each follow-up. Women were assessed at baseline in person, and a further four times at 3-month to 4-month intervals using a questionnaire. Life events were classified into 10 categories: family relationships, work, social relationships, education, legal, marriage and cohabitation, bereavement, migration, finance and health. Participants rated the impact of the life events on a five-point scale (1=very pleasant and 5=very unpleasant). The number of exposures to a negative life events was analysed for each time interval. Depressive symptoms were measured at the same time intervals using the 90-item Symptom Checklist (SCL-90).

Outcomes: Number of negative life events and depression score. Several models were compared including models with: (1) causal paths from depressive symptoms to life events, (2) causal paths from life events to depressive symptoms, (3) no causal paths but with factors for life events and depressive symptoms that were correlated.

METHODS

Design: Cohort study.

Follow-up period: 13 months (average).

MAIN RESULTS

The mean number of life events and mean depressive symptoms at the follow-up timepoints are shown in webextra table S1.

The features of the best-fit model were: the genetic risk factors for depressive symptoms and negative life events were two single common factors, with the same genetic factors influencing the phenotypes at all timepoints; for genetic effects, the causal path in the genetic part of the model went from negative life events to depression; shared environmental factors showed a similar structure to genetic factors but the causal path went from depression to negative life events; and individual-specific environmental influences on depressive symptoms and negative life events were best fit as two correlated latent factors.

CONCLUSIONS

The inter-relationship between depressive symptoms and negative life events is complex and varies across genetic, environmental and individual specific effects. Both reciprocal causation and shared latent influences contribute to the relationship.

ABSTRACTED FROM

Wichers M, Maes HH, Jacobs N, et al. Disentangling the causal inter-relationship between negative life events and depressive symptoms in women: a longitudinal twin study. *Psychol Med* 2012;**42**:1801–14.

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Wichers and colleagues drew on behavioural genetic and longitudinal research methods to understand the role of genes and environment in the relation between negative life events and depressive symptoms in a better manner. Negative life events have long been posited to play an important role in the aetiology of depression. A concurrent association between negative life events and depressive symptoms could be attributable to one (or more) of three possibilities: (1) negative life events exert a causal impact on depressive symptoms; (2) depressive symptoms exert a causal impact on negative life events or (3) a third variable has given rise to the association between negative life events and depressive symptoms. Using longitudinal designs, investigators have shown: (1) the experience of negative life events predicts increased risk of depressive symptoms and (2) people with

higher levels of depressive symptoms are at increased risk of experiencing negative life events. Thus, available evidence is consistent with a reciprocal relation between negative life events and depression. In behavioural genetics research, investigators use what is known about shared genetic material between relatives to derive estimates of variance in observed characteristics due to genetic and environmental factors.

Drawing on these research methods, Wichers and colleagues endeavoured to examine the complex reciprocal relation between negative life events and depressive symptoms in a genetically informative design. In a sample of adult female twins, results pointed to the role of (1) a direct 'inside the skin' path involving genetic influences on depressive symptoms and (2) an indirect 'outside the skin' path involving an impact of genes on depressive

symptoms through the role of negative life events. The direct path accounted for the vast majority of the variance at each time point. As in all naturalistic research, it is important to recognise that the answers obtained may be limited to the way constructs were operationalised and the extent to which variability in the constructs of interest was represented in the sample. Future research is needed to examine the different time lags between longitudinal assessment points and to further represent the range of depressive symptom severity.

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