

## To the Editor -

While accidents are a major cause of disability and mortality worldwide, their aetiology is not well understood. Risk factors appear to include socioeconomic deprivation, lower cognition, and being male, older, and unmarried/living alone.<sup>1-3</sup> Investigators have also shown that severe mental illness is associated with an elevated risk of accidents,<sup>2</sup> however, these observations are **exclusive** to individuals with mental disorders serious enough to warrant hospitalisation<sup>4</sup> or referral to an outpatient clinic. To the best of our knowledge, there has been no examination of the link between lower levels of distress and subsequent risk of accidents. Strong *prima facie* reasons to anticipate such a relationship include the symptoms of fatigue, poor concentration, and sleep disturbance, **that characterise even moderately distressed individuals**, which may impact unfavourably on decision-making, risk perception, coordination, and response time, so precipitating accidents.

Described in detail elsewhere,<sup>5</sup> we used data from sixteen independent, geographically-representative surveys with mortality surveillance (the Health Survey for England [N=13] and the Scottish Health Surveys [N=3]). Combining these studies in the context of an individual-participant meta-analysis resulted in a total of 193,873 participants, 166,606 (86%) of whom had data on age, sex and psychological distress. Psychological distress was measured using the 12-item General Health Questionnaire (GHQ-12) which contains items principally concerned with symptoms of depression and anxiety. The sensitivity (0.70) and specificity (0.80) against standardized psychiatric interview is acceptably high.<sup>6</sup> **Study members also reported if they had even been diagnosed with a psychiatric disorder and if they had used prescribed psychotropic medications.** Hazard ratios were computed using Cox proportional hazard models in which we accounted for between study variation using a shared frailty parameter. We used fractional polynomials to estimate the best-fitting dose-response curve.

In analyses of baseline data, we found that a higher prevalence of both self-reported psychiatric morbidity and psychotropic medications was apparent in the more psychologically distressed study members (supplemental figure 1). For instance, in people in the most distressed group (GHQ-12 score 12), 31% reported using psychotropic medications, whereas in the least distress group (GHQ-12 score 0) it was 2%.

A mean duration of 9.5 years of follow-up of 166,606 people (91,528 women) gave rise to 340 deaths ascribed to all accidents combined. In figure 1 we show that, following multivariable adjustment, an increase in the rate of accidental deaths occurred at a distress scores of above 3.

After excluding study members with either self-declared psychiatric morbidity or use of psychotropic medications (111,848 people; 218 accidental deaths), hazard ratios became elevated at the lowest level of distress symptoms. A test for trend indicated a dose-response effect across the full range of distress scores (p-value for trend  $\leq 0.001$ ), with a one-standard-deviation-increase in psychological distress associated with an increase in risk of accidents after multiple adjustment (1.17; 1.04, 1.33). In supplemental table 1 we present the risk of accidents according to standard categorisation of psychological distress ('asymptomatic', 'sub-clinical symptomatic', 'symptomatic', 'highly symptomatic').

In this, the first population-based study in the context of psychological distress symptoms and accidental death, we found that accident rates were raised even in people with low levels of distress. That we were also able to show that known risk factors for accidents – gender (male vs. female: 1.80; 1.45, 2.23), older (per year increase in age: 1.05; 1.05, 1.06), unmarried/living alone (1.97; 1.58, 2.45), and of lower social status (manual vs. non-manual social class: 1.48; 1.18, 1.85) – were replicated herein (HRs are age-and sex-adjusted) gives us some confidence in our novel results for psychological distress (supplemental table 2). With this association being stepwise and seemingly

robust to the adjustment of a series of confounding factors, implicates other, as yet unknown, mechanisms in this relationship.

## References

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## **Conflicts of Interest and Financial Disclosures**

None to declare.

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