

The role of health problems and drug treatments

in accidental injury at work

Summary report 2016

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In this document, you'll find a summary of the independent study The role of health problems and drug treatments in accidental injury at work by researchers at the University of Southampton. In addition to grant support from IOSH, this body of work was supported by programme funding from the Medical Research Council.



What is the problem?

The populations of Western countries are ageing. The prevalence of common age-related health conditions is rising among employees, as is the proportion of the workforce taking prescribed medicines. Because of this, there is concern that the risk of accidental injury at work might increase. Certain widely-used medicines, for example, have unwanted side effects (eg drowsiness), and some common illnesses may result in sudden incapacity (eg diabetes, epilepsy) or impaired judgement (eg mental health disorders).

Employers are responsible for managing such risks, but this can be challenging. While employers must safeguard their employees and those affected by their work, they must also avoid imposing needless restrictions on work opportunities, especially those that affect older employees. Careful risk assessment, informed by a proper evidence base, is therefore increasingly important.

To date, however, little is known about the impact of common health problems on the risk of injury in the workplace. Some research suggests that chronic health conditions and their treatments may only lead to a moderate increase in the risks of occupational injury, but most studies have been carried out among farm workers in the US and may not be relevant to other countries. One weakness of these studies is that they include no details about the exact cause, timing or type of the workplace injury, or the precise nature of the health problem.

So we commissioned Professor Keith Palmer and his team at the University of Southampton to investigate the risk of workplace injury arising from the following common health problems.

Epilepsy

Five in every 1,000 people of working age in the UK are treated and are potentially prone to sudden loss of consciousness or control.¹

Diabetes

The number of people developing this disease is increasing worldwide^{2,3} (type 2 diabetes is particularly linked with being overweight and with getting older). Complications of diabetes (e.g. eye and heart disease) and adverse effects of treatment (e.g. low blood sugar) may pose a risk to safety.

¹ Brown I and Prevett MC. Epilepsy. In: Palmer KT, Brown I, and Hobson J (eds). *Fitness for work: The medical aspects*. 5th ed, Oxford: Oxford University Press, 2013: 155–173

² Onkamo P, Väänänen S, Karvonen M and Tuomilehto J. Worldwide increase in incidence of Type I diabetes – the analysis of the data on published incidence trends. *Diabetologia* 1999; 42: 1395–1403.

³ Dunstan DW, Zimmet PZ, Welborn TA, de Courten MP, Cameron AJ, Sicree RA et al. The rising prevalence of diabetes and impaired glucose tolerance. The Australian Diabetes, Obesity and Lifestyle Study. *Diabetes Care* 2002; 25: 829–834.

Visual impairment

In England and Wales, about 80,000 people of working age have a visual impairment and more than 4,800 people under the age of 65 are registered as 'severely sight impaired' (blind) or 'sight impaired' (partially sighted);⁴ up to two million people are also living with some degree of visual impairment.⁵

Hearing difficulties

About two per cent of people of working age in Britain have severe difficulty in hearing.⁶ Impaired hearing and deafness can result in isolation from noisy hazards in the work environment, failure to recognise alarm signals and increased misunderstanding of safety instructions.

Mental health problems

These impair judgement, alertness and vigilance. Certain classes of commonly-prescribed medical drugs, often used in a mental health context, can cause drowsiness and affect performance and concentration.

Disorders of balance

These have not been researched very extensively, and there is a gap in knowledge.

What did our researchers do?

The team compared one group of people (the cases) who had suffered a workplace injury with a second group of people (the controls) who had not. The control group was 'matched' to the case group to make sure that certain characteristics (e.g. sex, age and where someone lived) were similar.

The team used the Clinical Practice Research Datalink (CPRD), a large general practice database compiled over two decades. Set up in 1987 by a government agency, the CPRD database has contributed greatly to research on the protection of public health. It holds the medical records of five million patients from 590 general practices throughout the UK (about six per cent of the population). The records cover all consultations with a family doctor and all referrals to hospital among those five million patients. Each consultation in the database is coded according to the patient's reported medical condition.

The researchers requested an anonymised dataset from the CPRD service, containing all consultation records over a 20-year period that had one of the 479 codes which the researchers had identified as some kind of occupational injury (e.g.

⁴ Denniston AKO and Murray PI. Oxford Handbook of Ophthalmology, Oxford University Press, 2009.

⁵ Bunce C and Wormald R. Leading causes of certification for blindness and partial sight in England and Wales. BMC Public Health 2006; 6: 58 doi: 10.1186/1471-2458-6-58.

⁶ 6 Palmer KT, Griffin MJ, Syddall HE, Davis A, Pannett B and Coggon D. Occupational exposure to noise and the attributable burden of hearing difficulties in Great Britain. Occupational and Environmental Medicine 2002; 59: 634–9.

'an accident at work', 'accident caused by a forging machine', etc). The dataset contained 1,348 cases, as well as 6,652 controls that were matched by age, gender and general practice (making a total of 8,000 records, of whom 5,915, or 74 per cent, were male).

The researchers also identified the various codes for each health condition of interest. In the dataset they found 149 separate codes for epilepsy and its treatment; 551 for diabetes and diabetic care; 416 for mental health problems; 183 for impairments of vision or hearing; 49 for dizziness and disorders of balance; and 219 for medicines with psychotropic effects (i.e. affecting the mind or mood).

The cases of injury and their matched controls were compared with these medical and treatment codes, eg, consultation about epilepsy or diabetes, and treatments received. If individuals had a code for problem or heavy drinking, this was taken into account. The researchers took care to ensure that any consultation for health problems preceded the injury event. They also analysed a subset of cases with more serious types of injury – eg, those attending hospital, receiving a doctor's medical certificate, sustaining a fracture or amputation.

What did the researchers find?

The research team looked at the characteristics of the dataset of 8,000 individuals and found that:

- 160 individuals (two per cent) had epilepsy, two-thirds of whom (107) had been prescribed medication for epilepsy
- a total of 199 (2.5 per cent) had diabetes, of whom 43 per cent needed to take insulin. Complications of diabetes were common: for example, 39 per cent had eye problems and about a quarter had poorly controlled disease.
- nearly a quarter of the 8,000 individuals (1,846) had consulted their family doctor about a mental health disorder – most commonly, neurosis. 1,682 people (21 per cent) had been prescribed medication for a mental health disorder. Anti-depressants were the most common drugs prescribed.
- 173 individuals (two per cent) had an eye problem, 793 (10 per cent) had an ear problem, and 266 (three per cent) had a problem with their balance.

Among the cases, 159 (12 per cent) had attended hospital for their injury and 230 (17 per cent) had been issued with a medical certificate.

Accident risks by disease and treatment

Epilepsy and diabetes

There was no statistically significant increase in the risk of occupational injury among workers with epilepsy or diabetes, even among individuals who took medication

known to affect consciousness, arousal, concentration and behaviour, or who had complications of these diseases (e.g. diabetic eye disease, poor diabetic control, severe epilepsy). In all, 29 people with epilepsy had suffered a workplace injury, but no injury appeared to be as a direct result of a seizure and no one had consulted a doctor about their epilepsy in the lead-up to their injury.

These findings may have arisen because people with very badly controlled disease are less likely to work in hazardous environments.

Sensory impairments and disorders of balance

Eye problems and ear problems were associated with an increased risk of occupational injury of about 30–60 per cent. Even higher risks were evident among individuals who were blind, had medically-defined visual impairments, or had a record of chronic infections of the middle ear. Deafness, hearing impairment, and use of a hearing aid also carried a higher risk of workplace injury, although these findings weren't significant statistically.

Ear problems can also be associated with disorders of balance, so analysis focused on risks concerning vertigo and various relevant disorders of the inner ear. Such disorders, if present in the 12 months before injury consultation, increased the likelihood of injury by more than 80 per cent.

Mental health disorders and drug treatment

The researchers found clear, consistent and statistically significant associations between all types of mental health problem and the likelihood of workplace injury. They also found that being prescribed psychotropic medication for a mental health disorder generally increased the risk of occupational injury by between 40 and 60 per cent. The researchers estimated that nine to ten per cent of workplace injuries might be avoided if the risks posed by mental health problems and their treatments could be fully controlled.

What does the research mean?

The researchers drew the following conclusions:

- There is no significantly increased risk of injury in the workplace among workers with epilepsy or diabetes. Because of restrictions often placed on the employment of people with these diseases, they are less likely to hold jobs that involve a high level of responsibility for other people or hazardous activities and they may also avoid such work themselves. Therefore, it can't be concluded that these diseases carry no risk of workplace injury. It seems safe to conclude, however, that current UK employment practices concerning diabetes and epilepsy do not put workers with these conditions at undue risk

of injury. There are also no grounds for increasing the current employment restrictions on them.

- There is a moderately increased risk of an injury in the workplace among workers with mental health problems and those prescribed psychotropic drug treatments.
- There is an increased risk of occupational injury among workers who have problems of vision, hearing or balance.
- In each of the medical cases mentioned, a significant minority of occupational injuries may be preventable by paying closer attention to the underlying health problem, including action to modify workplace practices.
- Blanket exclusion of individuals on health grounds isn't warranted. None of the risks of injury was raised to a level that would automatically stop a worker from being employed on health grounds. Instead, in situations where there are heightened overall risks, risk assessments should be carried out on an individual basis.
- Careful consideration of an individual's suitability for employment will be required, particularly among workers with active troublesome health problems and for those with jobs where an accident might carry a significant risk of injury to the worker or others.

Don't forget...

In common with most research studies, this one had a number of limitations:

- The researchers couldn't investigate workplace injuries that were self-treated or accidents that resulted only in damage to property, or near-miss events.
- The CPRD doesn't maintain a reliable record of people's occupations, and the records often lack information about whether the injury occurred through the fault of a third party or the individual. Also, the records don't show if all relevant controls were used. Although it is not believed that these factors caused any significant bias, routinely recording patients' occupations in the future would greatly enhance the value of the CPRD database as a research tool for investigating health factors in workplace injury.
- Fewer cases were identified than were expected on the basis of RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013) statistics. This probably arose because GPs coded some events as accidents without specifying their occupational origin. Omissions were probably random and were unlikely to affect these results; again, more attention to occupational coding would improve the value of this research resource.

Considerations for future research

Since no increased risk was found for epilepsy and diabetes, and unemployment rates are known to be higher in people with these diseases, it is possible that large numbers of people are being excluded from employment because of unnecessary restrictions. Future research should investigate the individual experiences of people of working age who have epilepsy and diabetes, in relation to recruitment and employment.

This summary provides all the main findings of the independent project report by the University of Southampton. If you are interested in reading about the study in more detail, you can download the full report at [iosh.com/research](https://www.iosh.com/research).

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