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The impact of mental health symptoms on heavy goods vehicle drivers' performance

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ABSTRACT

High levels of psychological distress in fulltime employees are prevalent (4.5% per month). Symptoms of impaired mental health include difficulties with attention, concentration, motivation, decision-making, visuo-motor control, and psychomotor reaction times. There is limited research on the impact these symptoms have on heavy goods vehicle (HGV) drivers' performance. In this study 1324 HGV drivers were surveyed using the Depression, Anxiety, Stress Scale (DASS) and the Health and Performance at Work Questionnaire (HPQ). Depression, anxiety and stress had little effect on driver absenteeism rates or self-rated driving performance. However, severe (1.5% of drivers) and very severe (1.8% of drivers) depression was associated with an increased odds ratio (OR = 4.5 and 5.0, respectively) for being involved in an accident or near miss in the past 28 days. This odd ratio is akin to driving with a blood alcohol content of about 0.08%. Given the number of HGV vehicles and the prevalence of depression this equates to 10,950 HGV drivers with an increased statistical risk of an accident or near miss. As the impact of HGV accidents is potentially large, including loss of life, it would be sensible to extend the research findings here into an action plan.

1. Introduction

Transport networks are the arteries of developed economies. Transport specific businesses contributed 4.63% of total Australian gross domestic product (GDP) in 2006–2007 (Department of Infrastructure Transport Regional Development and Local Government, 2008). Within the transport industry, road transport operations are a major economic contributor ($16,880 Million) (Department of Infrastructure Transport Regional Development and Local Government, 2008) to GDP. In Australia (2007) there were 331,824 heavy goods vehicles (HGV) on the road (excluding busses) (National Road Transport Commission, 2008). Road transport is necessary to support economic prosperity however it comes at a cost in terms of loss of goods and life due to accidents. Heavy goods vehicle accidents have been estimated to cost AUD $2 billion per year (National Road Transport Commission, 2002). According to the Australian Transport Safety Bureau (ATSB) (Australian Transport Safety Bureau, 2007) during the 12 months to the end of September 2007, there were: 225 deaths from crashes involving trucks. Of all fatalities on Australian roads, one in five involves a truck (Australian Transport Safety Bureau, 2007). Approximately one in five fatalities involving articulated trucks occurs in single vehicle accidents (Australian Transport Safety Bureau, 2007). Clearly, there is a large cost associated with loss of life and equipment. Understanding and identifying factors contributing to reduced truck driver performance are imperative.

It has been identified that long-distance truck drivers are vulnerable to health problems due to the mobile nature of the job, a greater exposure to health risks and medical indigence (Renner, 1998). Numerous studies have examined occupational correlates (e.g. working hours) of HGV drivers stress or fatigue (Hartley and El Hassani, 1994; Orris et al., 1997). Although there are a number of publications examining the potential for mental health problems contributing to reduced driving performance and increased accident rates in car drivers, there is none specific to HGV drivers. Although car drivers and HGV drivers are both operating machinery on the roads extrapolation of the effect of impaired mental health from car drivers to HGV drivers is problematic. First, truck drivers are on the road substantially more than car drivers are and therefore the exposure to risk of accidents is much greater. Truck drivers are far more experienced drivers than usual car drivers are. The skill sets required to operate a HGV differs from normal driving. Truck drivers

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also have a different lifestyle than normal drivers. Epidemiological evidence indicates a 12-month prevalence of mental disorders between 19% and 30% (Andrews et al., 2001; Bijl et al., 1998, 2003; Kessler et al., 1994, 2005; Wells et al., 2006) and a 1-month prevalence of 4.5% in full-time employees (Hilton et al., 2008b). However, there are no prevalence data available specific to HGV drivers.

One of the Australian Transport Council National Heavy Vehicle Safety Strategy 2003–2010 objectives is to reduce driver impairment. In car driving simulator tests, major depressive disorder (MDD) significantly impairs driving performance (Bulmash et al., 2006; Wingen et al., 2006). An Australian study found that depression increased the Odds Ratio (OR) for a fatal car or light commercial vehicle accident to 2.7 (McNicholas, 1999). A New Zealand study (Lam et al., 2005) suggests that, drivers with suicidal thoughts, who are not on antidepressant medication, have an OR of 4.2 for being involved in an accident. In older drivers (>55 years) scoring positive on the geriatric depression scale increased the relative risk for a police reported vehicle crash to 2.5 (Chapman and Perry, 2008). The juxtaposition of the data indicating that (1) deaths associated with HGV's account for 20% of the Australian road toll (Swann, 2002) and, (2) that depression increases the OR for a car accident (Chapman and Perry, 2008; Lam et al., 2005; McNicholas, 1999) and, (3) that depression reduces performance on driving simulators (Bulmash et al., 2006; Wingen et al., 2006) emphasises the need to examine the prevalence of mental disorders in HGV drivers and how mental health difficulties affect HGV driver performance.

It is known that mental health symptoms impair attention, concentration, memory, motivation, decision-making, visuo-motor control, attentional set-shifting, effortful information processing and slowed psychomotor reaction times (Hammar et al., 2003; Haslam et al., 2005; Klerman and Weissman, 1992; Lerner et al., 2004a,b; Purcell et al., 1997; Sabbe et al., 1999). Reductions in such domains result in a mental health related reduction in on-the-job performance for employees in general (Dewa and Lin, 2000; Kessler et al., 1999; Kessler and Frank, 1997; Lim et al., 2000). A reasonable conjecture is that HGV drivers are not immune to either mental health problems or the resulting performance decrements. Mental health problems increase workplace accident rates (Haslam et al., 2005; Suzuki et al., 2004; Wang et al., 2003). Different accidents have distinct implications and are very specific to occupational tasks. For HGV drivers, the impact of workplace accidents has the potential for enormous financial impact (expensive machinery and goods) and loss of life.

Given that the prevalence of mental health disorders in HGV drivers is unknown, in a pilot study, conducted in the state of New South Wales (NSW), Australia, the prevalence of anxiety, depression and stress is quantified in 1324 HGV drivers using the Depression, Anxiety, Stress Scale (DASS) (Lovibond and Lovibond, 1995). Previous data suggest that mental health difficulties impair employee functionality in general (Dewa and Lin, 2000; Kessler et al., 1999; Kessler and Frank, 1997; Lim et al., 2000), more specifically reduces car-driving performance (Bulmash et al., 2006; Wingen et al., 2006), and increases car accident rates (Chapman and Perry, 2008; Lam et al., 2005; McNicholas, 1999). Hence, we postulated that mental health problems might be associated with a reduction in HGV driver's performance (presenteeism) including an elevated accident rate and likely an increase in absenteeism rates. To investigate the mental health and driving performance association, the World Health Organisation Health and Performance at Work Questionnaire (HPQ) (Edington et al., 1997; Kessler et al., 2003a; Kessler et al., 2004; Wang et al., 2003;Yen et al., 1994) was used to quantify impact that mental health symptoms (DASS) have on HGV driver self-rated absenteeism, on the job performance (presenteeism) and accident rate.

2. Methods

2.1. Participants

Recruitment of HGV drivers occurred in two phases. First, 3000 survey packs that included an invitation letter, a copy of the survey and a reply paid envelope were sent out by the NSW Transport Workers Union (TWU) to their members between September 15th and December 31st, 2006. Only 243 surveys were returned (8% response rate). Phase two, the second survey period, ran from May 28th to July 20th, 2007. Trained personnel handed out and collected surveys at five busy truck stops in NSW.

A total of 3827 potential HGV drivers were approached to complete the survey in phase two of which 657 indicated they were not HGV drivers (3170 remaining eligible participants). Eight hundred and fifty nine HGV drivers said they would complete the survey later and mail it in, of which only 75 surveys were received (8.7% mail response). Eight hundred and eighty three HGV drivers refused the survey with the main reason given being that they did not have enough time. Fifty-six surveys were incomplete and not included in the analysis and 657 HGV drivers said they had already completed the survey. Thus, 926 surveys were completed at the truck stops yielding a total of 1001 phase two surveys completed in total. Subtracting out those who were ineligible and those who had already completed the survey yields 2789 transport workers approached to do the survey of which 1001 completed the survey and thus an overall phase two response rate of 35.9%. The total number of drivers surveyed (phase 1 + phase 2) was 1324 with 23 being female. Due to the low female numbers the data were not split by sex for subsequent analyses.

The study protocol was approved by The University of Queensland Human Research Ethics Committee.

2.2. The Questionnaire

The questionnaire, entitled the Health & Well-being Survey, was a combination of the Health and Performance at Work Questionnaire (HPQ), the Depression, Anxiety and Stress Scale (DASS) and the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT was included as alcohol consumption has been identified as negatively impacting on work performance (Blum et al., 1993).

2.2.1. HPQ

The HPQ was designed to evaluate employee productivity (absenteeism and presenteeism) for chronic and acute physical and mental health conditions (Edington et al., 1997; Kessler et al., 2003a, 2004; Wang et al., 2003; Yen et al., 1994). Further information on the HPQ can be located at http://www.hcp.med.harvard.edu/hpq/. The HPQ consists of 24 questions about chronic physical health conditions, 11 questions on acute physical health symptoms, the Kessler 6 (K6) to quantify psychological distress, eight questions about medical consultations in the last 12 months, 27 questions about performance at work and nine questions about demographic variables.

To quantify absenteeism the HPQ asks a number of memory-priming questions including, how many hours they actually worked in the past 7 days and, how many hours their employer expects them to work in a typical 7-day period. These are followed by a series of questions probing how many entire and part days they were absent from work in the past 28 days and how many were absent due to a physical or mental health condition. Days absent from work were summed to form the absenteeism metric.

Presenteeism reflects attending work with active symptoms (physical or mental) causing the employee not to function to their usual capacity. The HPQ contains a presenteeism measure that adjusts employee's performance by their self-reported perceptions