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The influence of occupational driver stress on work-related road safety: an exploratory review

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Research has identified a number of stressors that could impact on the occupational driver by increasing stress levels and, for some individuals, causing adverse behaviour and effects, for example, aggressive behaviour, fatigue, inattention/distraction, and substance abuse. For safety professionals and employers, one way to reduce the effects of occupational driver stress is to change perceptions so that management and drivers recognise that work-related driving is as important as other work-related tasks. This article explores relevant literature in relation to driver stress and suggests additions to risk management processes and safety procedures/policies, including assigning sufficient basic resources to target occupational stress (particularly occupational driver stress).

KEYWORDS

- OCCUPATIONAL DRIVER STRESS
- OCCUPATIONAL STRESS
- WORK-RELATED DRIVING
- WORK-RELATED ROAD INCIDENTS
- WORK-RELATED ROAD SAFETY

Introduction

Due to relatively little research in Australia and overseas, there is a need for increased attention to be devoted to the area of work-related road safety. Research is beginning to demonstrate the impact that occupational driver safety issues have on business effectiveness and road safety.^{1,2} Work-related road incidents represent a substantial emotional and financial cost to the community, for example, it has been estimated that the total cost of work-related road incidents in Australia is in the vicinity of \$1.5b, and that the average total insurance cost of a work-related road incident to organisations and society is approximately \$28,000.^{3,4} In addition, estimates of the true cost of work-related road incidents suggest that hidden costs may be somewhere between 8–36 times vehicle repair/replacement costs.⁵ These hidden costs relate to workers compensation, the medical costs associated with injury to staff and third parties, property loss, reductions in productivity due to days off work, loss of position and staff backfill costs as a result of absence from work, the legal costs associated with workers compensation and third party claims, as well as increased risk and insurance premiums.

A high proportion of work-related deaths and injuries are associated with road incidents. Work-related road incidents are about twice as likely to result in death or permanent disability than other workplace safety incidents, and account for up to 23% of work-related fatalities in Australia and 13% of the national road toll.^{3,5} A further 26% of fatalities result from incidents that occur while commuting to and from work, and it has been estimated that 49% of all work-related fatalities occur as a result of on-road crashes when commuting is also taken into account.⁶ Therefore, there is an urgent need for industry, government and the community to allocate resources to improve current knowledge and to develop interventions that reduce work-related road safety risks.

Occupational stress

Occupational stress is an area of particular concern as it appears to be prevalent in all organisations at varying levels of intensity and frequency.⁷ Research regularly indicates that occupational stress is an increasingly common feature of modern life.⁸ In Australia, stress claims represented 5.5% of total workplace claims (n = 7,875) for the 2002/03 period.⁹ This is a significant increase from the 1997/98 stress claims, which represented 2.9% of all claims (n = 4,385). It has been suggested that this increase is due to greater demands on workers (for example, multi-skilling, increased productivity) and better understanding and recognition of occupational stress as a workplace illness. The United States National Council of Compensation Insurance stated that mental stress accounted for 11% of all occupational claims.¹⁰ According to the Victorian WorkCover Authority, stress claims are 50% more costly than other claims due to the extended length of time required for processing stress claims and the specialised treatment required. A review of stress in the Australian public service found that a number of organisational factors predominated, including the safety environment, job control, job content, workload, scheduling, the social environment, support (or lack thereof), role definition, promotion and uncertainty.¹¹

A survey of 28,000 workers in 215 US organisations linked stress at work with poor work performance, acute and chronic health problems, and employee burnout.¹² Researchers in the United Kingdom estimated that 360 million working days are lost through sickness each year at an estimated cost of £8b.¹³ The UK Health and Safety Executive has estimated that at least half of these lost days are related to occupational stress. Research also indicates that occupational stress negatively affects job performance, resulting in increased absenteeism, turnover and counterproductive work behaviour, as well as decreased levels of task completion.^{14,17}

Research has demonstrated that individuals underperform, make mistakes and are careless in their routine work behaviour when they are

experiencing stress.¹⁸ It has also been estimated that between 60% and 80% of all work-related safety incidents are in some way stress-related.¹⁹ One US survey found that almost a quarter of the workforce aged between 25 and 44 years reported stress-induced nervous strain that was severe enough to "diminish performance".²⁰ In addition, the US National Institute for Occupational Safety and Health reported that stress-related disorders are fast becoming the most prevalent reason for worker disability claims. In Canada, as in the rest of the industrialised world, absenteeism has tripled during the past 15 years — and almost one-third of it has been attributed to stress-related disorders.²⁰ During 2006/07, 60% of Canadians claim to have experienced "negative job stress". These stressed employees are more likely to be involved in incidents, make mistakes and be absent from work.

Occupational driver stress

In the driving environment, stressors such as situational and task demands impact negatively on driver safety. When driving in the course of their work (driving between work/field locations for sales, servicing, maintenance, and so on), when driving for work (taxi, bus or truck drivers) or when commuting to and from work, drivers are likely to experience additional sources of stress. Research suggests that time pressures, thinking about work, and lack of concentration are risk factors for occupational drivers.^{1,21} These factors may also impact on driver safety if, for example, workers feel that they need to commit traffic offences (such as speeding or "tailgating") in order to meet task demands (such as making scheduled appointments on time).

Research has identified a number of stressors (namely, "driving environment", "work", "relationships" and "societal expectations") that could impact on the occupational driver by increasing stress levels and, for some individuals, causing adverse behaviour and effects. A considerable body of research has demonstrated that aggressive behaviour, fatigue, inattention/distraction, and substance abuse are contributing factors in road

crashes and fatalities.^{18,22-51} However, in some instances, it is believed that reactions to stress may also lead to road crashes and fatalities, especially in work-related driving. For example, unrealistic job quotas combined with slow traffic conditions may increase stress, which in turn may increase the potential for aggressive and erratic driving. The after-effects of negative moods, thoughts, or attitudes to work and family environments have been also found to increase driver stress.²²

Method

This study was primarily an exploratory review of research and literature relating to driver stress. The rationale for the article was to prove the OHS perception that work-related driving is a significant factor in work-related safety incidents and fatalities (in particular, that driver stress may be a significant factor for both occupational stress and occupational driver safety). In addition, occupational driver safety is not fully considered by some safety professionals, even though the vehicle used for the purpose of work is considered to be a "workplace" under most Australian OHS legislation.

Qualitative research conducted by the Centre for Accident Research and Road Safety — Queensland (CARRS-Q) was used to support information revealed by the literature review, to determine the topics to be discussed in this article, and to provide a practical reference for some of the areas under discussion.²⁸ Interviews were carried out in an organisation across five regional areas in Queensland, and involved 146 participants, ranging from field staff to management. The study sample was taken from a total organisational population of 532 staff (representing a participation rate of 27%). However, the study sample represented 64% of operational field staff ($n = 227$) for whom driving was a significant part of their work-related duties. The employees not considered for this study were primarily administration and engineering/design staff who performed little or no work-related driving. Interviews with the participants were conducted on a face-to-face basis either individually

or in small groups, using a semi-structured questionnaire that included open-ended questions. A number of interviews were conducted by telephone due to the remoteness of the work location of some participants ($n = 12$). Of the participants, 82% were randomly selected operational field staff, and the remaining 18% were operational managers and supervisors. Participants were asked a number of questions relating to the factors that affect their ability to drive safely and a number of quotes are used in this article to highlight those factors. During the interviews, the interviewer completed written notes which were later checked with the participants as to the correctness of quotes and interpretations made. Interviewees' names were not recorded, and the various organisational departments and regions where the interviews took place and the name of the organisation remain confidential.

Results and discussion

Relationship between occupational driver stress and work-related road crashes

Many individual stressors could affect occupational driver stress, and these are reviewed below. Figure 1 summarises the main stressors that both the literature and the qualitative research suggest as having the greatest effect on occupational driver stress. Figure 1 also shows the reported primary resultant driver behaviour due to the effects of stress.

Driving environment

Traffic congestion due to rush hour, crashes or other situations is frequently experienced and may be interpreted as stressful by many occupational drivers. Research has found that 50% of a sample of UK highway drivers reported traffic jams to be an irritation even if they were not in a hurry.²² Other researchers have reported that commuters who experience high traffic congestion have higher stress levels.²⁵⁻²⁷ This may prove to be significant for occupational drivers who are under pressure to complete job quotas, meet daily sales targets, or

have similar work pressures that require them to drive between work locations.

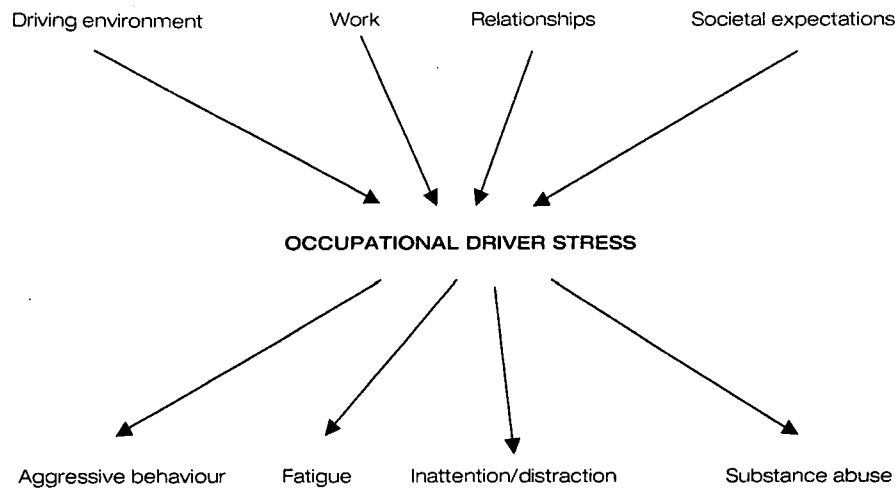
Recent research conducted in a large organisation revealed that a number of occupational drivers felt that "they are under the same time pressures to complete jobs as in the past, however, drivers are currently experiencing increasingly heavier traffic conditions".²⁸ In addition, the participants identified time pressures/work scheduling and increased traffic congestion on roads as stressful and as factors that contribute to incidents.²⁸

Work

Work-related problems may contribute to occupational driver stress, especially if the worker's concentration is impeded while driving.^{22,29} Work-related driving has been shown to be associated with an increased prevalence of speeding and driving while fatigued.^{30,32} In addition, research has found that occupational drivers drive more aggressively than other drivers.³³ Occupational driver stress may sometimes be an expression of problems at work, for example, demanding schedules may add to the stress of driving and other work activities.³⁴ The qualitative research participants stated that work pressures were a major factor with regard to occupational driver stress, and one male driver emphasised the beliefs of most drivers interviewed by stating: "I feel pressured to get to call outs ... like I should be there yesterday."²⁸

Research has found that significant numbers of occupational drivers indicate that time pressures to complete jobs, non-scheduling of travel time between jobs, and heavy traffic conditions contribute to work-related road incidents.²⁸ Occupational drivers have also reported that inattention due to fatigue and pressure/time restraints ("thinking of future jobs and not on the road") also contribute to incidents, for example, rear-end crashes.²⁸ Some drivers also felt that they were put under stress by fellow workers, for example, one young apprentice stated: "All the time I'm told to run yellow lights or go quicker by tradies ... but they won't drive and take the risks."²⁸ The statements expressed by the study participants

FIGURE 1
Occupational driver stress profile



suggest that occupational driver stress directly affects their road safety.

Relationships

Factors such as family difficulties may also contribute to driver stress if the driver's concentration is impeded while driving.^{22,29} Marital stress was also found to increase the risk of motor vehicle crashes.³⁵ When describing driving in the course of his work, one male interviewee stated: "I've been going through a divorce ... have not slept much ... I just can't seem to concentrate at times."²⁸ Emotions may also be stirred up by factors that are external to the traffic situation, for example, one study found that 20% of the drivers investigated who had been in fatal crashes had been upset about an incident in the last six hours of their lives.³⁶ This finding was supported by research reporting that emotional crises in the form of quarrels with significant others contribute to an increase in crash and violation rates.^{24,37,38} Another study found that the road user who drives when upset or angry may be doing so to "blow off emotional steam".³⁹ Such behaviour may be overtly aggressive (such as suicide or murder) or be represented by increased risk taking (such as speeding). In addition, during the six months before and after divorce, research has identified that drivers have a significantly higher

crash and violation rate than the general driving population (the most common violations being speeding, failure to stop, and tailgating).⁴⁰

Societal expectations

Income has been found to be inversely related to motor vehicle incidents, suggesting that financial situations may play a role in driver stress.²⁴ A US study of motor vehicle incidents/crashes involving a sample of 500 drivers aged between 19 and 88 years over a four-year period (1991–1995) found that economically secure individuals not only had fewer crashes but also that their recorded incidents were less serious than those of individuals who had financial concerns.³⁵ The term "keeping up with the Joneses" describes the pressure placed on individuals to succeed or appear to succeed. It has been suggested that financial pressure (relating to assets, monetary debts and gambling losses) contributes to stress, resulting in motor vehicle incidents due to "inattention" — a commonly reported contributing factor of motor vehicle crashes.⁴¹ For example, drivers may be concentrating on financial matters and not on the road.

In Australia, society encourages risk taking and competitiveness, and this is reflected in our driving behaviour (giving credence to the term "people

drive as they live").⁴² In terms of road users, research argues that, in a society which values feelings of control and a sense of achievement and power, drivers (particularly young drivers) find little manifestation of these values in their work activities, but can find them in driving activities.⁴³ A person who is not socially integrated may use driving as an outlet for feelings of frustration, conflict and aggression, and may exhibit such emotions while driving. The pressure of "life" and societal expectations may place stress on individuals, who may in turn use driving as a release from this stress or use their vehicle as a tool to redirect feelings of frustration and stress.

Effects due to driver stress

The effects of driver stress include aggressive behaviour, fatigue, inattention/distraction, and substance abuse. From the literature and qualitative research, these effects or reactions were reported as being significantly related to occupational driver stress. In addition, drivers may be affected by more than one reaction, for example, they may demonstrate inattention due to fatigue. These effects/reactions are examined below.

Aggressive behaviour

Research has demonstrated that aggressive drivers (that is, those with a general predisposition to hostility and aggression) report higher rates of minor incident involvement than the general driving population, and are more likely to engage in risky behaviour such as overtaking frequently and tailgating.²³ A US study has found that the rate of aggressive driving incidents (defined as events in which angry drivers injure another driver after a traffic dispute) increased by 51% between 1990 and 1996.⁴⁴ In addition, many of these drivers had recently suffered an emotional or professional setback (potential work or relationship stressors). Focus groups conducted at the Injury Prevention Centre at the University of Southern California ascertained that two-thirds of drivers reacted aggressively to frustrating situations.⁴⁵ In addition, almost half of the focus group participants admitted

to driving behaviour that held the potential for injury to another person, for example, engaging in behaviour such as braking suddenly and refusing to let another vehicle pass. Not surprisingly, the factors that contribute to aggressive behaviour on the road also contribute to aggression elsewhere. These factors include stress, anger, and the extent of the learned response to these mood states.⁴¹ As such, it is suggested that someone who displays aggressive behaviour on the job may also be aggressive on the road and, therefore, may have a high risk of being involved in a work-related driving incident. In addition, stress caused by aggressive behaviour is harmful to health and lowers the quality of life.⁴⁶ Aggressive behaviour is not only linked to higher work-related road incidents, but also to adverse publicity for organisations, especially if company logos are visible on work vehicles (for example, when company drivers direct abuse at other drivers verbally and/or by physical gestures).

Fatigue

Research into fatigue-related crash statistics reveals that estimates of the proportion of crashes attributable to driver fatigue vary from 5% to 50%.⁴⁷ A proportion of these crashes involves drivers who have fallen asleep at the wheel, and an even higher proportion may involve inattention due to fatigue.⁴⁸

It has been found that increased anxiety, stress and negative mood states are associated with indicators of fatigue.⁴⁹ In addition, driver fatigue is influenced by psychological factors, and reducing anxiety (as well as increasing positive mood states) may help to control the effects of fatigue.⁵⁰ Further research has suggested that stress may impair driving by causing "sleep loss or greater fatigue".⁵¹ This is due to the human body's reaction to mental strain and continual stressful thought processes.⁵¹ One male driver stated during the qualitative research interviews that he was "working out at [location] all day and was tired driving back ... don't know what happened, wasn't concentrating and didn't see the [truck tyre blow-out left on the road], swerved to miss it, lost control and rear of the wagon side-swiped a tree".²⁸ As such, stress should be

considered in conjunction with excessive hours at work and hours awake as a contributing factor of fatigue in the workplace. Although a number of organisations use "fatigue management" as a way of addressing this issue, many have not — particularly in regard to work-related driving.

Inattention/distraction

In the US, the National Highway Traffic Safety Administration estimated that at least 25% of all police-reported crashes involve some form of driver inattention.⁵² Likewise, in Queensland in 2002, 25% of fatalities and 31% of all crashes were reported as having driver inattention as a contributing factor.⁵³ Additional research has reported that stress may impair driving through distraction or inattention, for example, by concentrating on stress-related events rather than on immediate traffic conditions.⁵¹ Inattention was also highlighted during the qualitative research, which indicated that occupational driver stress was a contributing factor in road incidents caused by inattention. For example, one driver stated: "I wasn't thinking of driving and didn't see the roo till too late."²⁸ The actual (statistical) prevalence, although considered as significant, has not been thoroughly researched or reported.

Substance abuse

The final factor focuses on research involving occupational drivers from four different companies, which found that incident-involved drivers reported significantly higher average weekly alcohol consumption levels than incident-free drivers.¹⁸ It was suggested that increased alcohol consumption (as an effective coping mechanism or stress moderator), or escapist drinking (as a way to escape, forget or redefine the effects of stressful experiences), may be an indicator of the level of stress experienced by the individual.¹⁸ It may also be a contributing factor in incident/crash involvement, for example, higher levels of alcohol consumption among drivers who have been involved in crashes may indicate the use of alcohol as a means of coping with stress.¹⁸ In addition to alcohol consumption, driver stress may impair driving through more

indirect mechanisms (such as increased illicit drug or sedative use).⁵¹

Countermeasures

For safety professionals and employers, one way to reduce the effects of occupational driver stress may involve changing perceptions so that work-related driving (no matter how frequently work vehicles are on the road) is perceived to be as important as other work-related tasks. Furthermore, stress management (including driver stress) should be incorporated into the broader risk management process.⁵⁴ This may mean including work-related driving/travel in risk management processes (that is, risk identification, assessment, evaluation and reduction) and safety procedures/policies (relating to occupational driver stress). For example:

- implement procedures to identify and reduce relevant stressors (for example, driving environment, work, relationships and expectations);
- allow adequate travel time between jobs/appointments;
- re-examine job/task quotas (allowing sufficient time for safe travel between jobs);
- avoid traffic congestion and adverse road conditions (for example, consider the time of day, alternative routes, the use of new technology or radio broadcasts that indicate the least congested routes to destinations);
- log and monitor journey times;
- report, analyse and record work-related road incident details, near misses, traffic offences and customer complaints;
- implement procedures to identify behaviour and signs of individual workers (including employees, contractors or self-employed) being affected by stress and related events (for example, loss of concentration, alcohol abuse, divorce, financial difficulties, aggressive behaviour);

- develop safety systems that include aspects of work-related driving and driver stress (for example, fatigue management);
- identify and communicate individual stress reducers in the organisation; and
- ensure that support mechanisms are in place for individuals who are affected by stress.

The above list is by no means exhaustive. Many characteristics are specific to an organisation (including different industries or types of work performed) and may have an impact on the type and extent of stressors incurred and the requirements to adequately address those stressors. For example, ergonomics and other specific human factors may have an effect on occupational driver stress in some organisations. However, ergonomic issues related to driver stress were not identified by the interview participants or as a major factor in recent literature — although for some organisations/industries, such as trucking/taxi operations, this is a major factor, possibly due to the increased comfort and safety features in modern vehicles. Nonetheless, organisations should individually assess occupational driver stress and determine countermeasures that are relevant to their situation.

Conclusion

The available literature and qualitative research suggest that occupational driver stress is a work-related road safety issue and that it may be a more significant problem than previously thought. Individuals may be simultaneously affected by more than one type of stressor, for example, work and financial, relationship and financial, work and driving environment, and so on. Furthermore, individuals experiencing occupational driver stress may display one or more responses/reactions, such as inattention due to stress-induced fatigue, or taking alcohol or other drugs to cope with depression brought on by stress.

Due to the “plateau” effect of some current road safety countermeasures, safety researchers/professionals need to identify and implement

additional strategies in order to further reduce work-related road incidents and fatalities. This article has highlighted occupational driver stress as a considerable OHS problem and it is suggested that future countermeasure development could provide the impetus for continual work-related road incident reduction.

Reducing the incidence of occupational driver stress will require assigning resources to target organisational procedures and risk management principles. A good place to start is to acknowledge occupational stress (including occupational driver stress) as a significant workplace safety issue, highlight organisational commitment to identifying and reducing stress effects in the relevant OHS policies and procedures, and communicate with staff.

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