



Health & Wellbeing at Work

**PHYSICAL AND MENTAL
HEALTH AND WELLBEING
OF HEAVY VEHICLE
DRIVERS IN THE ROAD
TRANSPORT INDUSTRY:
RISKS, ISSUES, AND
IMPACTS**

**A LITERATURE REVIEW PREPARED BY
THE OZHELP FOUNDATION**



THE OZHELP FOUNDATION

The OzHelp Foundation (OzHelp) is a leading provider of workplace wellbeing programs specialising in mental health and suicide prevention.

OzHelp's evidence-based, pro-active health and wellbeing programs are designed to assist employers to create mentally healthy workplaces by supporting individuals to achieve and maintain their best possible health and wellbeing.

Accredited under the National Standards for Mental Health Services, OzHelp is leading the sector in innovation and has been selected by the Federal Department of Health to deliver the National Suicide Prevention Leadership Strategy.

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The National Heavy Vehicle Regulator, through its Heavy Vehicle Safety Initiative program, has funded the OzHelp Foundation to develop a health promotion and assistance package for owner drivers. This paper has been prepared to inform the development of a health promotion intervention with owner drivers.

The paper was drafted by Michelle Jones, and edited by Dr Meg Perceval and Dr Doris Kordes, OzHelp Foundation. Dr Coralie Wilson from the University of Wollongong provided advice on the paper's content and structure.

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OzHelp Foundation believes that the information contained in this literature review was accurate and reliable at the time of publication. The websites quoted were accessible at the time of publication. OzHelp Foundation cannot take responsibility for the accuracy or future availability of these sites.

For questions about this review contact Info@ozhelp.org.au

FOREWORD

The health and wellbeing of heavy vehicle drivers is an issue of vital importance to all Australians. Ensuring drivers are healthy is not only important to them, it is an issue that impacts their families and friends, everyone else on our roads and our nation's economy as a whole.

Throughout the COVID-19 pandemic, we have seen the critical role that drivers play in keeping our supermarket shelves stocked and other essential goods moving to where they are needed. It has demonstrated how reliant we all are on the road freight industry and underscores the need to prioritise the health of the drivers that keep Australia moving.

That's why this literature review, published by the OzHelp Foundation and funded through the Heavy Vehicle Safety Initiative (HVSII), is so timely and important. It examines the prevalence of ill health, injury and disease among drivers and highlights initiatives that may be effective in addressing their health needs. This paper brings OzHelp's extensive experience in designing mental health and suicide prevention services for people in blue collar, male-dominated industries to our industry. The result is a paper that addresses drivers' issues with compassion and understanding and within a strengths-based framework. Most importantly, it emphasises that the heavy vehicle driver must be central to the design of any solution.

This paper provides an important contribution to our knowledge of driver health and wellbeing issues, and how they impact on suicidality, morbidity and mortality statistics, road safety, and community functioning. It reminds us of the importance of understanding the driver within a social context of work pressures and routines, and their connections with family and community, to better understand the causal factors for ill health, injury, and disease.

The NHVR is committed to supporting a safe, efficient, and productive heavy vehicle industry serving the needs of Australia. A key example of NHVR's commitment to this vision is our involvement in administering the HVSII program on behalf of the Commonwealth Government. The HVSII program funds activities that will deliver safety benefits for the heavy vehicle industry and other road users.

We know that healthy drivers are safer drivers. Through better understanding of the different factors that influence driver health and wellbeing we can target programs that will really make a difference. This literature review prepared by OzHelp supports this aim, contributing to the development of a comprehensive evidence-base which will help policy makers develop targeted and effective health and safety initiatives.

I congratulate OzHelp on this important report and look forward to working together to support a healthier, safer industry into the future.



Sal Petroccitto

Chief Executive Officer
National Heavy Vehicle Regulator
October 2020



EXECUTIVE SUMMARY

The OzHelp Foundation has been funded by the National Heavy Vehicle Regulator to design, develop, implement, and evaluate a health and wellbeing program to assist owner drivers increase their capacity to look after their physical and mental health and wellbeing. This literature review represents a key deliverable of the grant agreement under the Heavy Vehicle Safety Initiative.

In 2020, there are an estimated 209,300 truck drivers in Australia, with the average age of 47 years. About 97 per cent of drivers are men. On average, heavy vehicle drivers work 49 hours per week.

The literature review found that Australian heavy vehicle drivers are subject to constant time pressures and demands relating to meeting regulatory burdens, long workdays, and tight deadlines. It has been described as one of the 'unhealthiest' and 'deadliest' jobs in the country. Increased work hours, shift work, fatigue, irregular shifts, being away from families, and the need for mental alertness contribute to some drivers turning to alcohol and drug use. Not surprisingly, heavy vehicle drivers carry a higher burden of disease and injury than other occupations.

The sedentary nature of their occupation, combined with a poor diet and lack of exercise, puts drivers at risk of obesity and developing chronic diseases such as diabetes, mental ill-health, and cardiovascular health issues. Truck drivers represent the second highest occupational group, after construction workers, at risk of suicide.

The health and wellbeing of heavy vehicle drivers is everyone's business. Drivers' health affects not only the individual and their family and community; there is a direct correlation between chronic diseases, injuries, ill-health, and fatigue with road safety. Given the importance of the road transport industry to Australia's economic functioning, and its pervasiveness across urban, rural, remote, and very remote regions, the importance of developing effective strategies to support the health and wellbeing needs of drivers cannot be over-emphasised.

AIM

The findings of this literature review will be used to inform OzHelp's development of a health promotion trial co-designed with owner drivers.

CONTENTS



1. Overview	06
1.1 Key findings	06
1.2 Profile of the Australian heavy vehicle driver	06
2. Chronic disease and injuries	07
2.1 Physical health	08
2.2 Mental health	08
2.3 Injuries	08
3. Determinants of health	10
3.1 Diet and exercise	10
3.2 Sleep	10
3.3 Social connection	11
3.4 Substance abuse	11
4. Prevention, promotion, and early intervention	12
5. Concluding comments	13
References	14
Endnotes	18

1. OVERVIEW



This paper reviews Australian and international research on the issues and risks to heavy vehicle drivers' physical and mental health and wellbeing.

The purpose of the review is to better understand the prevalence of ill health, injury, and disease among drivers, and consider strategies that may be effective in addressing their physical and mental health needs.

The findings of this review will help inform the OzHelp Foundation's development of a health promotion and assistance package that is relevant and meaningful for owner drivers.

1.1 KEY FINDINGS

Heavy vehicle driving has been described as one of the 'unhealthiest' and 'deadliest' jobs in the country.ⁱ Australian drivers carry a heavy burden of disease and injury. They are more likely to experience cardiovascular disease; hypertension; diabetes; mental illness; obstructive sleep apnoea; metabolic disorders; respiratory conditions; and musculoskeletal disorders and workplace injuries.ⁱⁱ These diseases and injuries have been largely attributed to lifestyle factors such as poor diet, lack of exercise, and substance use.¹ Other contributing issues to poorer health outcomes in truck drivers include overweight and obesity; poor sleep, and fatigue.ⁱⁱ

Underpinning these health outcomes and their contributory lifestyle factors are the structural work conditions under which drivers operate, which may constrain their capacity for good health and wellbeing. The working conditions of many heavy vehicle drivers also constrain their ability to access the health services they need in a timely manner. Roads usually by-pass rural towns or there are restrictions where the trucks cannot be driven into the towns or cities.ⁱⁱⁱ

This limits drivers' abilities to access hospitals, doctors and pharmacies while working on the road.^{iv} These access restrictions are significant when their long workdays are taken into consideration.

1.2 PROFILE OF THE AUSTRALIAN HEAVY VEHICLE DRIVER

The road transport industry in Australia moves goods around the country every day of the year, 24 hours a day. It traverses millions of kilometres each year, reaching the most rural and remote areas that other forms of transport are not able to access. Heavy vehicle drivers haul freight within and across state and territory borders.² Australian Bureau of Statistics (ABS) data indicate that, of the 195,619 million tonne-kilometres of movement across Australia³ in the 12 months leading up to 31 October 2014:

- 68 per cent were intrastate (including local) movement
- 32 per cent were interstate movement.

While most heavy vehicle movements are intrastate, in the Australian context these are likely to involve long distances, requiring extended periods of time away from home and family. For example, Western Australia, which has the highest rate of intrastate movement, has a landmass of 2,527,013 square kilometres.⁴

Australia's road transport industry is made up of a range of different vehicles that require the expertise of licensed truck drivers. These include heavy haulage; tanker and fuel operators; car carriers; furniture carriers; freight forwarders; refrigerated transport; general freight operators; livestock and grain industries; tipper/quarry haulage; buses; oversize transport; and timber cartage.^v In 2019 there were 103,038 articulated trucks, 353,759 heavy rigid trucks, 166,972 light rigid trucks, 24,669 non-freight carrying vehicles and 99,379 buses registered in Australia.^{vi}

The composition of the transport industry is diverse. In its 2018 inquiry into national freight and supply chain

¹ The findings of these research studies have been reinforced throughout OzHelp's consultations with owner drivers, which found that the key areas for owner drivers are diet and exercise; sleep; connections with family and friends; financial wellbeing; on-the-job pressures; and owner driver community.

² In correspondence with the National Heavy Vehicle Regulator (NHVR), OzHelp was informed that a breakdown of local-intrastate-interstate figures is dependent on the freight task, which can fluctuate depending on the demands and time of the year. Second, whilst the NHVR can provide an estimation for different driver types, further field validation and reliability testing is required prior to external releases. The road freight movement data provided by ABS is regarded as the most useful for estimating the amount of interstate and intrastate movement across Australia.

³ Tonne-kilometres measure the volume of the freight transport task, and represent mass moved over distance (ABS, 2015).

⁴ Only 11.5 per cent of total tonnes carried were interstate. The ABS notes that the 'higher percentage for tonne-kilometres is due to the higher number of kilometres travelled in interstate trips' (ABS, 2015).

priorities, the Australian Government Department of Infrastructure, Regional Development and Cities noted that, in 2002 there were about 47,000 businesses in the road freight transport industry. These businesses range from multinationals through to sole traders. At least 72 per cent of operators own at least one truck, while 1 per cent of operators own more than 10 trucks.^{vii}

There are an estimated 209,300 truck drivers in Australia, with the average age of a truck driver being 47 years old.^{viii} Transport is a male dominated industry: about 97 per cent of truck drivers are men.^{ix} Research shows that men who work in male dominated industries have a higher rate of depression and suicide than other industries.^x The factors contributing to mental ill-health among heavy vehicle drivers are discussed in more detail, below.

Around 85 per cent of truck drivers work in a full-time capacity and they work on average 49 hours each week^{xi} in comparison with the average Australian working week of 32.3 hours in 2019.^{xii}

Drivers are subject to constant time pressures and demands, which can lead to depression, anxiety and sleeping disorders.^{xiii} Stress, long shifts and tight deadlines have been described as barriers to a healthy lifestyle.^{xiv} Long days on the road combined with high work demands play a role in shaping drivers' coping strategies and, ultimately, contributing to their health and wellbeing outcomes.⁵

2. CHRONIC DISEASE AND INJURIES

Chronic diseases, including mental ill-health, have a significant impact on Australia's health care system and economy. Chronic disease is defined by the Australian Institute of Health and Welfare as arthritis, asthma, back pain, cancer, cardiovascular disease, chronic obstructive pulmonary disease, diabetes and mental health conditions.^{xv}

In 2016 nearly 9 out of 10 deaths in Australia were associated with chronic disease. Risk factors for developing a chronic disease include tobacco smoking, obesity, excessive alcohol consumption, insufficient exercise, poor diet and high blood pressure.^{xvi}

Heavy vehicle drivers have been shown to have many

of the risk factors contributing to a chronic disease diagnosis.^{xvii} Rates of chronic disease among Australian truck drivers are currently not available; however, the international evidence shows that many truck drivers experience significant risk factors, and a burden of chronic disease and mental ill-health.^{xviii} Further research with Australian heavy vehicle drivers is required to compare and contrast with the findings of international studies that portray this occupation as having one of the highest rates of mortality and morbidity.

Injuries impact on truck driver everyday lives and livelihoods. In 2015-16, injury was the third highest area of health care spending in Australia at \$8.9 billion, after musculoskeletal disorders (\$12.5 billion) and cardiovascular diseases (\$10.4 billion).^{xix} About 23 per cent of all injury deaths in Australia during 2016-17 were suicide, while road transport crashes accounted for 11 per cent of injuries.^{xx}

5 These issues were raised in OzHelp's consultations with owner drivers, who also referred to the ongoing negotiation between compliance with regulations and pressures to deliver on time, impacting on their health and wellbeing, finances, relationships, and general quality of life. OzHelp is aware that the National Transport Commission is leading a review of the Heavy Vehicle National Law and its supporting regulations, which commenced in November 2018 and is expected to be presented to the Council of Australian Governments in May 2021 - <https://www.hvnreviewntc.gov.au/>

2.1 PHYSICAL HEALTH

American statistics have identified that male truck drivers' life expectancy is from 12.1 years (age 63 years) to 19.4 years (age 55.7 years) less than the general American population (age 75.1 years).^{xxi} While the American health system differs from Australia's and the statistics were obtained in 2006, combined with what we do know from Australian data, it does indicate there is significant risk to the health and life expectancy of truck drivers.^{xxii}

Research undertaken in the USA, Canada, Colombia, Italy, Finland, China and Japan and Australia has found that high cholesterol, hypertension, diabetes, cardiovascular disease, and musculoskeletal problems are common health issues for truck drivers around the world.^{xxiii} Similar health issues were identified in a meta-narrative systematic review of 32 studies from 10 countries including Australia, incorporating 151,644 commercial truck drivers, 98 per cent of which were male.^{xxiv}

The systematic review of 32 studies also found that truck drivers with diabetes were at greater risk of crashes, particularly if the diabetes is uncontrolled or with low blood sugar levels.^{xxv} Further, the review found an association between obesity and the risk of crashes, particularly where comorbidities such as sleep disorders and fatigue syndromes were present.

Hypertension can lead to many chronic health conditions, and there is a high incidence rate of hypertension in truck drivers.^{xxvi}

Lifestyle factors related to the job of driving a truck itself, such as shift work and insufficient sleep, have been linked to chronic conditions such as metabolic disease and diabetes.^{xxvii} Colombian research found that 29.1 per cent of truck drivers suffer from high job strain and stress.^{xxviii}

Research has also linked long work hours, shift work, exposure to toxic fumes, noise and vibration exposure, lack of exercise, and sleep deprivation with cancer, mental health disorders, musculoskeletal disorders, respiratory conditions, cardiovascular disease, and substance use issues.^{xxix}

2.2 MENTAL HEALTH

Workers in male dominated industries and occupations are at a higher risk of depression, stress, mental health issues and suicide, than other occupations.^{xxx} In addition to gender norms and expectations, potential explanatory factors include increased exposure to threats and violence, greater job demands, lack of physical activity, time pressures, low job status, lack of social support, job insecurity, effort-reward imbalance, and long work hours.^{xxxi} The main risk factors for depression in these industries have been identified as a lack of support from employers, managers, or colleagues

and workplace procedures, high job demands, poor health, being overworked and poor lifestyle choices.^{xxxii}

Contributory factors for truck drivers developing a mood disorder such as depression and anxiety include job dissatisfaction, poor working conditions, and workplace injury.^{xxxiii} Work pressures have been shown to account for many of the exacerbating factors relating to mood disorders in truck drivers.^{xxxiv} These include shipping deadlines, short notice trips, hurried scheduled extensions, unscheduled extensions, self and employer-induced pressures, extra loads, long working hours, fatigue, non-work waiting time, traffic hazards, regulations and accidents.^{xxxv} Stressful situations on the roads, traffic accidents, fines, hazardous working conditions^{xxxvi} and motorists driving into trucks as the means of suicide have also been associated with depression, anxiety, stress, and post-traumatic stress disorder (PTSD) for truck drivers.^{xxxvii}

Owners of small to medium sized businesses have been shown to suffer increased levels of distress and job tension, and are more likely to go to work while sick; factors that have a cumulative effect on their health and wellbeing.^{xxxviii} Furthermore, a lack of social supports, relationship issues, absence from family and community, financial pressures, legal problems and fatigue may also contribute to truck drivers becoming depressed or anxious.^{xxxix}

A recent study of Australian truck drivers showed that they experience long periods of isolation, sleep deprivation, work overload, unfavourable working conditions and an inability to access healthcare, all contributing to depression.^{xl}

When depressed, men are more likely to externalise their symptoms through substance use, risk taking behaviour, anger, irritability and low mood.^{xli} Some of these symptoms do not align with standard diagnostic criteria for depression and may prevent diagnosis and treatment.^{xlii}

The mental health of truck drivers is important not only for the individual and the industry; it has broader repercussions for society, including road safety. An Iranian study conducted over two years with 800 heavy truck and lorry drivers found that depression and anxiety increase their chance of accidents (2.4 and 2.7 accidents odds respectively).^{xliii} These findings are replicated in other international studies.^{xliv}

2.3 INJURIES

An Australian landmark study on transport worker compensation claims analysed 120,742 claims submitted between 2004 to 2015 to provide insights into the prevalence of work-related injury and disease among truck drivers in comparison with the general

population.^{xlv} The mechanism of injury was recorded as falls, trips and slips, sound and pressure, chemicals and other substances, vehicle incidents, hitting objects with a part of the body, body stressing, biological factors, being hit by objects, heat, mental stress, electricity and other environmental factors.^{xlvi}

Other work-related injuries included fractures, musculoskeletal, neurological psychological injury and other traumatic injuries and diseases not specifically defined in the study.^{xlvii}

Of the 120,742 claims there were 545 compensated fatalities, a rate 13 times higher than all other industries. This makes truck driving the deadliest occupation in Australia.^{xlviii}

The study's authors recommend an urgent need to provide resources for promoting health and wellbeing to older drivers, as there is a greater risk of work-related injury claim as drivers age.^{xlix}

Half of the mental health claims from this Australian study involved conditions requiring counselling and/or medication support of 10 weeks or longer.^l The causes for these claims have been described as hearing loss, chemical exposure, heat related issues, electrical injuries, mental stress, biological, neurological and being involved in or experiencing a vehicle accident.^{li} All together, these claims represented over one million working weeks lost, which is a significant issue for workers and employers alike in the transport industry.^{lii}

Increased exposure to pain, injury and death, has been linked to an increased risk for suicide.^{liii} Suicide is deliberate and intentional self-harm resulting in fatal injury/death.^{liv} In 2018, 3,046 people died from intentional self-harm in Australia.^{lv} Of these, 2,320 were male and 726 were female. The age-standardised death rate in 2018 was 12.1 deaths per 100,000 people. The male rate of suicide in Australia is three times the rate of females.

A retrospective mortality study found there were 513 'driver' suicides in Australia from 2001 to 2010.^{lvi} Of these, 98 per cent (n=502) were male. The highest rate of suicide was in truck drivers with 323 suicides (63 per cent), compared to 51 automobile drivers, 50 rail drivers, 39 bus and coach drivers, 32 delivery drivers and 14 train and tram drivers.

The rate of suicide of road and rail drivers was 22.6 per 100,000 compared to 15.9 per 100,000 in other occupations. The highest risk age group was 35-44 years with 33.7 per cent of suicides, followed by 45-54 years, at 26.7 per cent.^{lvii}

Evidence from the Queensland State Suicide Register showed that truck drivers represented the second highest occupational group for the total number of suicides between 1990 and 2006, after construction workers.^{lviii} It found a higher incidence of suicide among males in the construction, transport and agriculture industries than the general population.^{lix} Similar to the retrospective mortality study, the age group reported to be most affected was those aged 35-54 years (56.5 per cent of transport occupation suicides). This was followed by persons aged 15-34 years (32.3 per cent of transport occupation suicides), and then 55-64 years (11.2 per cent of transport occupation suicides).^{lx}

People who have been exposed to or affected by suicide are at a higher risk of suicide and suicidal ideation. Suicide-exposed bereaved people are four times more likely to develop Post Traumatic Stress Disorder (PTSD).^{lxi} Truck drivers may be exposed to suicide through the death of a friend, family member, work colleague or motorists who use their vehicle as a means of suicide by driving into a truck. In this last instance, not only does the truck driver experience the trauma of being a first responder, but they are also left with the guilt of being involved in the accident.^{lxii} National Transport Insurance and the National Truck Accident Research Centre (NTARC) reviewed fatal truck and car accidents throughout 2019, and found that 37.9 per cent 'were indicated or strongly indicated to be suicides by the driver of the car'.^{lxiii}



3. DETERMINANTS OF HEALTH



The link between social factors and health outcomes is well established.^{lxiv}

The World Health Organisation refers to this as the determinants of health; ‘the range of behavioural, biological, socio-economic and environmental factors that influence the health status of individuals or populations.’^{lxv}

The determinants of health look beyond individual behaviour or exposure to risk, to consider how broader social, ecological, economic and cultural structures shape people’s health outcomes.^{lxvi}

Truck drivers’ higher risks of developing chronic diseases may be explained by considering the constraints under which they organise their work that contribute to a lack of exercise, a high body mass index (BMI),⁶ increased rates of smoking, lower HDL cholesterol (good cholesterol), and poor sleep.^{lxvii} Further, research studies have demonstrated the links between sleep disorders – arising out of truck drivers’ work conditions - and mental ill-health.^{lxviii}

The impact of societal structures on individual health outcomes requires a broad, multi-level response to effect improvements. Studies have recommended a change to government policies to ensure truck drivers have access to truck stops, toilets, restaurants with healthy food, sleeping cabins along truck routes and green spaces to walk and exercise.^{lxix}

3.1 DIET AND EXERCISE

Research studies have found that, in general, heavy vehicle drivers have poor quality diets.^{lxx} They are more likely to consume processed foods high in saturated fat, with increased levels of salt and sugar, and less likely to eat fresh fruit and vegetables.^{lxxi}

Some of the barriers to consuming healthy food include a lack of access to outlets selling healthier options, as trucks often by-pass towns due to parking regulations; work schedules leading to a lack of time for food purchasing and pre-preparation; limited food storage

options; the increased cost of healthy foods, if available, at truck stops; and a lack of tasty and quality healthier food choices at places where truck drivers do access foods.^{lxxii}

In comparison with other occupations, truck drivers engage in less physical activity.^{lxxiii} This is directly related to the sedentary occupation of driving and long workdays behind the wheel, which limit their capacity for physical exercise.^{lxxiv} As noted in a study of the New Zealand log transport industry, ‘a driver who gets home at 6pm and goes to bed at 8:30pm for a 3am start, has little opportunity for exercise’.^{lxxv}

The sedentary nature of their work, combined with a poor diet and lack of exercise, may result in increased rates of obesity among truck drivers.^{lxxvi} A Queensland study found that workers in the transport industry have the largest waist circumferences, and the second highest incidence of overweight or obesity in comparison with other workers.^{lxxvii} Studies have shown that truck drivers in the USA have an average BMI of 30 and above, which is higher than the general population.^{lxxviii} A person with a BMI of 25 and above has a 14 times higher risk of developing obstructive sleep apnoea (OSA), while a person with a BMI of 30 and above has a 25 times higher risk of developing OSA.^{lxxix}

Overweight and obesity also puts drivers at a higher risk of developing chronic diseases such as diabetes, metabolic syndrome, mental ill-health and cardiac health issues.^{lxxx}

Overweight and obesity in combination with a lack of exercise and long work hours also increases people’s levels of fatigue, which in turn may compromise drivers’ safety and performance.^{lxxxi} Conversely, truck drivers who were able to increase their physical activity levels have been shown to reduce their risk of developing a chronic disease and be safer on the roads.^{lxxxii}

3.2 SLEEP

Achieving quality sleep can be a significant challenge for truck drivers.^{lxxxiii}

Barriers include the logistics of long hauls; having to sleep in a confined space; background noise due to traffic and perhaps livestock that they may be carrying; and lights from traffic, the roadside or truck stop.^{lxxxiv}

6 Body mass index (BMI) is used to determine whether a person is underweight (BMI less than 18.5), in a healthy weight range (BMI of 18.5-24.9), overweight (BMI of 25-29.9), or obese (BMI of 30 and over). It is calculated by dividing a person’s weight in kilograms by the square of their height in metres. There are limitations in relying on BMI as a single measure to determine overweight and obesity, as it cannot take into account muscle mass, age, sex, and ethnicity, or where the fat is stored, for example, waist circumference (Australian Institute of Health and Welfare 2017).

Sleep related issues have been directly linked to workplace injuries and near misses.^{bxxxv} Fatigue increases the risk of workplace injury at an odds ratio of 2.87 – 2.97.

This means that if a truck driver is fatigued, they are almost three times more likely to have a workplace injury.^{bxxxvi}

Fatigue also results in increased daytime sleepiness,^{bxxxvii} which has been linked to depression, increased BMI and OSA.^{bxxxviii}

OSA is a condition where the airway at the back of the throat becomes partially or completely blocked during sleep resulting in reduced oxygen levels or a complete lack of breathing. The person then wakes up suddenly to initiate breathing.^{bxxxix} The condition has an adverse effect on the heart and many people who suffer from OSA then go on to develop hypertension.^{xc}

Currently in Australia, a truck driver with diagnosed OSA can face having their truck license cancelled, which may often be their only means of income.^{xcii} The threat of their license possibly being cancelled if they are diagnosed with OSA may present a barrier to seeking treatment.^{xciii} Those at greatest risk of OSA are middle aged men, those with a large neck circumference and high waist to hip ratio.^{xciii}

An international study found that 25.82 per cent of truck drivers were suspected of having OSA, which places them at an increased risk of an accident.^{xciv} Another study found that truck drivers used a range of coping strategies to alleviate drowsiness and boredom and improve social interaction. These included performing secondary tasks while driving, such as removing a jacket, getting food or a beverage from a refrigerator or bag, face rubbing, interacting with a mobile phone or truck technology or doing administrative tasks.^{xcv}

Sleep disorders such as OSA and insomnia contribute to reduced sleep quality in truck drivers.^{xcvi} Poor sleep quality has been linked to mental health disorders, particularly depression and anxiety.^{xcvii} Therefore, given the likelihood of truck drivers receiving inadequate quality of sleep, this may then place them at higher risk of a mental health disorder, as well as other health problems associated with poor sleep.

Not surprisingly, people who suffer from OSA are more likely to experience excessive daytime sleepiness.^{xcviii} There is an association between both motor vehicle accidents, near miss accidents and excessive daytime sleepiness with the most common cause being OSA.^{xcix}

3.3 SOCIAL CONNECTION

Families are an important support for truck drivers in times of stress.^c Strong social connection has been linked to improved health outcomes^{ci} and is an important protective factor for suicide.^{cii}

So too, a lack of social connection has been linked to adverse health outcomes,^{ciii} including risk for suicide.^{civ} Being single, widowed, separated or divorced may increase a man's sense of loneliness, an effect not seen in females.^{cv} Heavy vehicle drivers typically spend much of their working time alone. Long workdays and - for some - long road trips far from home, may constrain drivers' social connections and create pressures on the family unit.^{cvi} Consequently, this may also contribute to an increased risk of a variety of adverse physical, mental and social health outcomes, and the risk of suicide.

An evaluation of the New Zealand log transport industry notes the impacts that 14-hour workdays may have on the quality of family life. Approximately 37 per cent of 225 log truck drivers reported having challenges in fitting work and home life into their days, 'with failed relationships and isolation from family being common'.^{cvi}

3.4 SUBSTANCE ABUSE

Alcohol consumption is the primary cause of workplace absenteeism and workplace injuries across the world and is also a significant risk factor in traffic accidents.^{cviii} An overseas study found that binge drinking at least once a month increases the risk of a person having a motor vehicle or truck accident by 10 times.^{cix}

Misuse of prescription medication as well as illegal drugs have been identified as a means for truck drivers to cope with the pressures of timelines, fatigue, pain and mental health problems.^{cx} International studies have shown that there are increasing pressures being placed on the performance and productivity of truck drivers.^{cxii} To meet these increasing demands, research findings show that some drivers may turn to stimulant substances, including legally prescribed and illegally sourced amphetamines such as dexamphetamine, speed, and ice.^{cxiii} Low doses of stimulant drugs can benefit drivers in managing fatigue.^{cxiii} However, studies also show that ongoing, chronic and high drug use reduces driving skills and increases the risk of accidents.^{cxiv}

Research conducted in twelve countries, including Australia, analysed the drug use of 43,673 truck drivers. The research concluded that increased working schedules, shift work, fatigue, irregular shifts, being away from families and the need for mental alertness can all lead to increased risk taking behaviour such as alcohol, tobacco and other drug use.^{cxv} Random drug testing in Australia has found the incidence of alcohol intoxication reducing and the incidence of drug use increasing in motorists, including but not limited to truck drivers.^{cxvi}

4. PREVENTION, PROMOTION, AND EARLY INTERVENTION

Effective health prevention, promotion and early intervention programs are those tailored to and reflective of the working lives of heavy vehicle drivers. Multi-faceted health programs have been shown to work with truck drivers. These programs include education, telehealth monitoring and health assessment, personalised medical care, online and telephone support, safety education,^{cxvii} counselling, and alcohol and drug rehabilitation.^{cxviii}

Health literacy is a key component of strengthening population health outcomes. International research studies describe the effectiveness of truck driver education on exercise and diet, safe sex, and awareness of the health risks associated with obesity such as metabolic disorder, diabetes, heart disease and OSA.^{cxix}

Individualised dietary counselling and education delivered to South Australian truck drivers have shown to be beneficial in reducing fat intake and increasing their consumption of healthy food choices.^{cxx}

Conducting health screens in the workplace to identify OSA and mental ill health have been shown to improve drivers' health outcomes, as therapeutic interventions can be given early in the diagnosis.^{cxxi}

A review of Sub-Saharan African health care programs was able to demonstrate the effectiveness of providing services along trucking corridors such as mobile health screen clinics delivered by healthcare workers and peer educators.^{cxxii}

There are a range of evidence-based, specifically tailored, self-monitoring training and coaching exercise programs that have achieved results for truck drivers.^{cxixiii} These remotely administered and multi-component programs, which include a weight-loss competition supported with body weight and behavioral self-monitoring, computer-based training, and motivational interviewing, have been shown to effectively achieve weight loss in truck drivers.^{cxixiv} These programs could be strengthened by the inclusion of information such as where truck drivers can access exercise equipment or can undertake physical activity in different locations their route may take them through.^{cxixv}

A Queensland-based study found that wearable fitness devices, such as an activity tracker, was effective in helping drivers to increase their exercise.^{cxixvi} The *Shifting Gears* program was also designed to encourage drivers to make dietary changes. The study found that this component was ineffective for those drivers who may have required more tailored support in making different dietary choices. Another component of the program involved financial incentives which, through drivers' accumulation of points, rewarded their physical activity and dietary choices (\$30-\$200) after their program completion. This component was found to be ineffective in enabling behavioural change. The Queensland study findings are limited by its small sample size (19 drivers completed the program).

There is still a stigma in relation to mental health, and programs specifically targeting mental ill-health may prove challenging in terms of uptake. Programs targeting stress and wellness are more widely accepted than those specifically targeted to mental ill-health.^{cxixvii}

Workplace strategies that target upskilling work colleagues and other individuals have been successful in identifying people at risk of suicide.^{cxixviii} Beneficial education includes information relating to mental health conditions; reducing the stigma of mental health and suicide; and understanding how behavioural changes can be early warning signs that a person is struggling with their mental health.^{cxixix}

Studies indicate that truck drivers experiencing PTSD related issues may be affected by night driving, and experience stress due to weather, previous accidents and hauling dangerous goods.^{cxxx} One successful intervention strategy has been the use of virtual reality (VR) technology to assist in de-sensitizing the driver by showing the stressful event in a controlled setting and providing support.^{cxxxi}

To reduce fatigue in truck drivers, studies recommend that promotional activities and information about sleep disorders be included in educational strategies.^{cxxxii} Education on effective sleeping strategies has been shown to reduce the risks relating to motor vehicle accidents and fatigue.^{cxxxiii} Promotional activities include stress management, healthy sleep hygiene, movement exploration and meditation.^{cxxxiv}

Continuous Positive Airway Pressure (CPAP) therapy could be broadly promoted as a treatment for OSA. Studies have shown that after two years of this therapy, a truck driver's risk of a near miss accident is the same as a driver without OSA.^{cxxxv} The long-term health outcomes for drivers who have sought treatment for OSA is also significantly better than not having any treatment.^{cxxxvi}

5. CONCLUDING COMMENTS

The findings of this literature review into the physical and mental health and wellbeing of heavy vehicle drivers in the road transport industry demonstrate the close correlation between structural, occupational and lifestyle factors with the prevalence of diseases and injuries among drivers. The constraints under which drivers operate have a direct bearing on their capacity to maximise their health and wellbeing outcomes. Drivers' commitment to making healthy food choices, taking regular exercise, achieving adequate sleep, and maintaining social connections are more likely to be realised if the work settings in which they operate develop policies and practices that promote health and wellbeing.

Critical to the effectiveness of these interventions is placing the heavy vehicle driver at the heart of solution design, and also incorporating those in the drivers' 'ecosystem' who can contribute to their health and wellbeing, including partners, family members, driving colleagues, industry leaders/employers, and regulators.



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