



Exploring knowledge and attitudes of taxi drivers with regard to obstructive sleep apnoea syndrome

Ridvan T Firestone, Philippa H Gander

Abstract

Aim To examine the attitudes of taxi drivers towards symptoms of obstructive sleep apnoea syndrome (OSAS), and to determine whether these attitudes could influence their health and safety as a professional driver.

Method Qualitative research based on three focus groups conducted in Wellington, New Zealand. Participants were 27 taxi drivers who had a high pre-test risk for obstructive sleep apnoea. Assignment to focus groups was based on self-identification as being Māori and Pacific peoples, New Zealand European, or non-Māori and non-Pacific.

Results Participants described avoidance of health issues and dissatisfaction with their general practitioners. These attitudes were attributable to: (i) lack of knowledge, (ii) deliberate avoidance, and (iii) fear of loss of employment and income.

Conclusions The attitudes and level of knowledge of the focus group participants lead us to make the following recommendations. Drivers need systematic education about the effects of insufficient sleep and of OSAS on driving skills and safety. Taxi managers and drivers should cooperate to develop and implement safe driving policies to manage driver fatigue. Clear guidelines are needed for drivers, managers, and healthcare professionals on the diagnosis and treatment of sleep disorders among drivers, and their potential consequences for driver licensing.

In New Zealand, motor vehicle accidents (MVAs) account for over 30% of all deaths from external causes.¹ Alcohol, speed, and not wearing seat belts are commonly identified as causal factors,¹ however driver sleepiness and fatigue are estimated to contribute to 20% of all injury crashes.²

Obstructive sleep apnoea syndrome (OSAS) is a medical condition that is associated with elevated sleepiness and a heightened risk of MVAs.³⁻⁵ This condition is characterised by repetitive episodes of complete or partial upper airway obstruction that occur during sleep, and are usually terminated by brief arousals.⁶ Disease severity is defined by the number of apnoea (complete obstruction) and hypopnoea (partial obstruction) events per hour of sleep, as measured by the apnoea-hypopnoea index (AHI).⁶⁻⁸

The most common treatment for OSAS is nasal continuous positive airway pressure (CPAP), which splints the airway open during sleep and significantly improves daytime sleepiness.^{9,10} The profile of risk factors for OSAS suggests that prevalence may be high among professional drivers. These include being male, middle-older age, and having an elevated BMI, which may be exacerbated by the sedentary lifestyle of professional drivers.

Our recent study (n=243) estimated a high proportion (15%) of moderate to high risk of OSA among a sample of New Zealand-based taxi drivers.¹¹ In that study, our prediction equation was used to estimate the probability of having at least 15 respiratory disturbance events (apnoeas) per hour of sleep, using the respiratory disturbance index ($RDI \geq 15$). The equation included the following variables: being male, increasing age, increasing neck size, excessive daytime sleepiness ($ESS > 10$), snoring 'always', and reported observed apnoeas. These variables have been shown to be consistent predictors of OSA,¹² and thus it is considered to provide reliable estimates of *a priori* probability of OSA with 71–80% sensitivity and 81–86% specificity. This predictive model is in the process of being prospectively validated.

An Australian study of commercial vehicle drivers (n=2342) found 16% had OSAS.¹³ A recent study found an unexpectedly high prevalence (77.7%) of OSA (at least five respiratory disturbances per hour of sleep, $RD \geq 5$) among 153 Israeli professional drivers,¹⁴ of whom 47.1% were classified as sleepy, and 19% had severe sleepiness (classified as an average sleep latency on the multiple sleep latency test ≤ 5 minutes). Another study of 216 Hong Kong bus drivers found over 9% had OSAS, as defined by having an $RDI \geq 5$ and having excessive daytime sleepiness (Epworth Sleepiness Score ≥ 10).

There is minimal information available about the prevalence of sleep disorders among professional taxi drivers, who are at elevated risk for MVAs because of the extended time they spend driving, compared to non-professional drivers. In New Zealand, the taxi industry has recently undergone significant deregulation, which some industry participants believe has resulted in a progressive decline in drivers' working conditions and a surplus of taxi cabs and drivers.¹⁵ Some drivers maintain that this has forced them into working longer hours in order to earn a living.¹⁶

The increased MVA risk among untreated OSAS sufferers has drawn the attention of regulatory authorities in a number of countries, including New Zealand and Australia.^{17–19} The debate centres on whether OSAS sufferers should be allowed to hold certain categories of driving license, and on the conditions under which treated OSAS sufferers should be allowed to continue to drive. A major difficulty is predicting who is at elevated risk for MVAs, because the severity of sleep disordered breathing is not reliably correlated with measures of daytime sleepiness.

Risk assessment for the individual OSAS patient currently remains a clinical decision based on a combination of objective and subjective information.²⁰ Clinicians may (but are not obliged to) advise the chief medical advisor outlining a drivers' medical and driving circumstances, and make appropriate recommendations (e.g. temporarily suspend a drivers' license pending adequate treatment of OSAS).¹⁸

In New Zealand, access to specialist services for the diagnosis and treatment of OSAS is through referral from general practitioners (GPs), who are also typically responsible for follow-up evaluation of the adequacy of treatment, should this be imposed as a condition for driver licensing.

The aim of this research was to explore the attitudes of professional taxi drivers around OSAS symptoms. In particular, the study sought to better understand how drivers' attitudes influence their behaviour with regard to managing their health and safety as a professional driver.

Methods

Two local taxi companies distributed study packages to their drivers, which included a two-page questionnaire and a consent form for participation in a focus group. A total of 125 consent forms were returned. For each participant, questionnaire responses were used to derive a pre-test risk of OSA, defined as having an RDI \geq 15, based on a multivariate predictive model.¹¹ Recruitment continued until there were sufficient numbers in each focus group.

The groups were conducted at the Research School of Public Health, Massey University (New Zealand), in an environment that offered a neutral context for drivers to interact freely and with anonymity from their company management. The focus groups were co-facilitated by one of the named authors (RF) and a qualified medical physician. Each group lasted two hours. Nominal group technique was employed to minimise influence and tangential discussion.²¹

In line with this technique, participants were asked to write their responses to a set of semi-structured questions (“*Think of a time when you were working [as a taxi driver], and you felt really tired, not refreshed, and sleepy on the job, now consider these following questions.*” *How did you feel working in this situation? Were you worried about how you could perform as a taxi driver? If you were worried, what did you do about it?*).

Each participant’s responses were transcribed openly, and common ideas and different responses were identified, and used to prioritise topics and initiate group discussion. The focus group methodology is described in detail elsewhere.¹⁶ Table 1 describes the characteristics of each focus group. The “Other Ethnicity” group was self-identified, and included drivers from Asia, Fiji-Indian, and northern and eastern European countries.

Table 1. Focus group characteristics

Group	Number of men	Number of women	Age (years)	Taxi-driving experience (years)
New Zealand European	7	3	36–66	3–30
Māori/Pacific	6	1	46–64	1–27
Other ethnicity	8	0	40–64	4–37

Results

One major theme identified from the analysis of the focus group transcripts,¹⁶ and which is the focus of the analyses presented here, was characterised as “driver avoidance of health issues and dissatisfaction with doctors”. Within this major theme, three sub-themes were identified, namely: ignorance, avoidance, and personal fear.

Ignorance

Ignorance was defined as a lack of awareness about the underlying causes of sleepiness, and the potential risks of sleepy driving, and a lack of knowledge about the availability of treatment services for OSAS. It included both driver ignorance and ignorance among medical professionals. The following excerpts typify driver ignorance.

Driver 21 added: “I think most people [are] not aware that this is a problem. It’s just one of the things that happen! ...I think it’s just a lazy type of job you just sitting down—ya got nothing else to do [laughs.]”

Driver 22: “...my problem [i.e. OSAS] was identified with snoring. My wife complained to my doctor and she was the one that started this whole investigation off.”

Drivers were generally unaware that a symptom such as sleepiness could be an indicator of an underlying medical problem. Some blamed the sedentary nature of the job, which was perceived as inducing daytime sleepiness. This demonstrates ignorance of the physiological basis of sleepiness. As expected, drivers who had OSAS symptoms during sleep were unaware of them, until family members highlighted these issues.

Some drivers reported good relationships with their GPs and attended regular check-ups. However, their involvement in the focus groups had clearly heightened their awareness about OSAS symptoms and the dangers of sleepy driving, and in return the drivers expressed concerns about their GPs lack of screening for sleep complaints as part of their routine medical check-ups.

Driver 11: I see my doctor 4 times a year minimum ... he's never asked me that question [sleep related]...

Driver 14 added: Yeah the doctor never asks about sleep. Never!

Driver 16 said: ... [My doctor] might say to me, oh [it's] this time of the month, you haven't had a prostate for 12 months, we'll check you over...If I was sleepy, I'd soon tell him that's for sure. But that's a personal thing, I guess ...

From the comments, it appeared that doctors were generally more concerned with evaluating the more familiar medical issues that could affect a driver's license renewal, such as visual acuity, hypertension, and other medical conditions such as diabetes, but even these conditions were not routinely assessed according to some drivers. Another facet of this problem was that some drivers did not think to mention sleep-related issues as a health concern, because they did not identify them as a priority, as illustrated by the following example.

Driver 11: You don't even think to tell the doctor when you get there, you don't even think about it ... you worry about your eyesight and what not, and so forth, not the sleeping business!

The overall impression obtained from the discussion was that many of the drivers' GPs are not well informed about sleepiness or sleep complaints, nor do they routinely assess symptoms of OSAS.

Avoidance

The second sub-theme, avoidance, was defined as a conscious decision by drivers not to reveal health concerns to their GPs. The following discussion illustrates this.

Driver 17: You tell him [doctor], and then they'll probably give you another test or something else and that will delay your certificate of driving, and that's probably the worst thing...a delay of another week ... it might delay you the last certificate for fitness, you know to go and get your licence, you see what I mean?

Driver 15 added: ...yeah might open a can of worms

Driver 17 continued: I mean if the doctor tells you 'excuse me sir, you're a little bit overweight, try and lose some weight,' you don't want to say 'what about my sleeping disorder?' 'I feel a bit tired!' You don't want to open up, you know? And I suppose all the taxi drivers ... feel like that too.

The issues raised by these two drivers led others into a group consensus. The first issue is withholding information in order to protect their employment status. Both drivers described actively concealing any health problems that might impact on their being assessed as medically unfit to drive. This is understandable in the prevailing

context where there was no standard format for the fitness-to-drive screening of professional taxi drivers carried out by GPs.

The second issue relates to withholding information from the doctor for personal reasons. Driver 17 raised the point that drivers who are overweight, and know that they have a sleeping problem, would not seek help from the doctor because they would feel embarrassed. Other reasons for avoiding seeing the doctor included both the cost of the consultation and any medications prescribed, and the loss of income from being off the road to attend the appointment.

Personal fear

The third sub-theme was personal fear. This was characterised by drivers not wanting to believe that something is physically wrong, or being apprehensive about finding out about further or more serious health conditions that could compromise their ability to earn a living. A common element in this sub-theme was mistrust of other people's concerns about the driver's health.

Driver 17: ... I used to smoke until 3 years ago and my wife used to say 'you snore a lot you might as well you know try and stop smoking'. So three years ago I stopped but I'm still snoring [laughs with the group]. ... It's either your wife or somebody, your friend watching you while you're sleeping and they tell you that there's something wrong with your sleeping. But you never believe them because you don't know what you're doing while you're sleeping.

Fear of loss of income was a significant factor for the participants, who face considerable day-to-day variability in income and very limited alternatives for owner drivers if they get sick. One approach suggested was to seek additional information (e.g. on the internet) to assess the possible outcomes, before speaking to the doctor. This approach also avoids medical costs (e.g., medication, specialists, and laboratory tests).

Driver 24: If I knew I had apnoea and I was scared to go to the doctor because I might lose my license I might get some information first [like searching the internet or reading a book]. If apnoea was treatable then I'll go and seek help and treat it. If not, I'd probably shut up [laughs].

Taking time out from driving to look after personal needs was identified with loss of income, although it was recognised that failing to look after one's self could lead to larger health problems in the long term. Whether attributed to greed or need, this seemed to be accepted as part of the 'taxi culture', because of the competitive nature of the business.

Driver 20: I mean not everyone is hard fetched for cash. Some people are just like that you know. The first thing is to get another job ... maybe I'm wrong but that's how I look at it. A lot of people would do these things. They don't have any time for themselves. All they do is sit on the stand and work and work and work, and after a certain time and unless people decide no they have to make some times for themselves they have a problem and they got to go and see a doctor. They have to make the time you know.

The themes identified above reflect attitudes which may limit drivers' ability to recognise and act on OSAS symptoms or other sleep complaints. This raised the question of who they saw as being responsible for their health and safety. Some believed that their GPs were responsible, because they conduct the medical check-ups and provide a certificate, effectively declaring drivers as 'fit and safe' to drive, whilst others believed that the onus of responsibility lies heavily on the individual driver.

Discussion

This qualitative exploration of the attitudes of taxi drivers at high risk for OSA has highlighted a number of areas where strategies could be implemented to improve driver health and safety.

First, the lack of knowledge among drivers about the causes of sleepiness, including OSAS, and the associated driving risk, points to the need for better driver fatigue management education.

The National Road Safety Committee has developed an inter-agency *Driver Fatigue Strategy*.²² One of the deliverables in the strategy is a commitment to providing 'educative measures to assist drivers to modify their behaviour to reduce the incidence of driver fatigue'. In relation to commercial drivers, the Accident Compensation Commission is charged with workplace delivery of 'Managing Fatigue' training and raising awareness with heavy motor vehicle drivers. In addition, the New Zealand Land Transport Agency (NZLTA) is charged to ensure that the fatigue section of the "Your Safe Driving Policy" resource reflects the most up-to-date advice on managing fatigue.

From examining the NZLTA website in May 2009, advice for companies developing a "Safe Driving Policy" indicated that the policy must address driver fatigue, but fatigue management education was not discussed among the recommended strategies. Nor was it listed as a course to consider for driver training and education, although it was recommended that regular staff seminars or refresher meetings should cover fatigue as one of a number of listed topics.

With regard to the issues raised by the present study, it is not clear whether any of these measures will reach taxi drivers, most of whom either work as subcontractors or are self-employed, but pay dues to a taxi company that provides communication services and branding.

Another option would be to include driver fatigue management education as part of the approved course that drivers must undertake to get a P-endorsement licence to carry paying passengers. This approach means that the regulating authority takes responsibility for providing such education, but the responsibility remains with the individual drivers to apply this knowledge in their professional activity.

Fatigue management training has been shown to result in better knowledge levels and (self-reported) improvements in personal fatigue management strategies among professional tanker drivers.²³

Acknowledging the role of shift-work is important as well, particularly as sleep becomes displaced from its usual night position, and this can pose problems with neurobehavioral and cognitive performance.

Shift-workers tend to select their sleep-wake schedules because of their work commitments and this disrupts the synchronisation of internal sleep structure. This results in sleep deprivation, fragmented sleep, and complaints of excessive daytime sleepiness.²⁴ The issues around shift-work, sleep deprivation and other sleep disorders are a complex web of circadian, sleep and social factors, with each influencing the other and impacting on the ability to adapt and cope with daily pressures.²⁵ It is also

outside the scope of this study, but it is a necessary consideration in future research with professional taxi drivers.

Second, in the experience of these focus group participants, GPs did not routinely ask questions regarding sleepiness or OSAS symptoms, nor did they demonstrate knowledge or awareness of sleep problems in general, or the risks associated with sleepy driving. For example, some drivers were told that sleepiness was part of the normal aging process, or that they just needed to lose weight.¹⁶

These findings are consistent with previous research,^{26–28} which has also highlighted the need for continuing medical education programmes to up-skill GPs in sleep medicine. One of the deliverables in the national Driver Fatigue Strategy is to ensure that medical practitioners are aware of the effects of sleep deprivation and its contribution to driver fatigue.²²

The role of GPs is pivotal for managing taxi driver fatigue issues, because of their established rapport with their regular patients, especially since they act as a conduit for referral to specialist services for OSAS treatment and diagnosis, and because follow-up management of OSAS patients is often referred back to GPs. However, the relationship between taxi drivers and their GPs is complicated by the fact that GPs also have the responsibility for evaluating whether a driver is fit for work.

Both in the legally-required medical assessments for license renewal, and if significant health concerns are identified between the required assessments, a GP can notify the Chief Medical Advisor who may decide to suspend a driver's license. The drivers in the present study were acutely aware of this and admitted to actively concealing any health problems that might impact on their being assessed as medically fit to drive. Similar issues have been reported with other groups of professional drivers.^{13,14,27–29}

Clearer guidance from the NZLTA about the criteria for being considered medically unfit, and about returning to work subject to adequate treatment, could help diffuse some of these concerns, if drivers and their GPs knew about the criteria. Standardised forms for required medical assessments might also improve drivers' confidence and assist GPs in this process.

In the national Driver Fatigue Strategy, the NZLTA committed to reviewing the relevant sections of its 'Medical Aspects of Fitness to Drive' resource and related forms for medical practitioners, by December 2008. However, use of these resources is voluntary and it is unclear how many GPs are aware of them, or use them. Another possibility would be to have the fitness-to-drive medical assessments undertaken by trained occupational physicians who are not the driver's GP, as is the case for commercial airline pilots.

With regard to ongoing management of professional drivers with OSAS who are receiving treatment such as Continuous Positive Airway Pressure (CPAP), one approach used in the UK (Rosemary Gibson, personal communication, 2008) is to schedule an annual check-up at the sleep clinic, which includes downloading the data collected by the CPAP machine about the amount of time that it has been used. Threshold criteria for treatment compliance can be then used to trigger different actions. For example, if a driver's usage rate is at least 80%, then the driver's license can be renewed.

If the usage rate is between 50-80%, the driver is required to return for a further follow up at the sleep clinic in three months time. Lower rates of usage could trigger a referral back to the sleep specialist. This process could be reinforced by forwarding the names of non-compliant drivers to the regulator, in the interests of public safety. However, in New Zealand, funding for sleep apnoea services is directed at diagnosis and initial follow-up.

There is no funding for long-term follow-up of patients on CPAP due to limited resources (Dr Alister Neill, personal communication, 2008). It might have been interesting to explore the acceptability of this approach with drivers in the focus groups. However their lack of knowledge and experience with OSAS treatment would have rendered this discussion very hypothetical.

To improve the identification, diagnosis, and management of OSAS patients, additional research is needed to provide reliable screening tools for GPs, and to clarify measures to identify those individuals most likely to be at elevated risk for MVAs.²⁰ However, improvements in the identification and referral of patients with OSAS at the primary care level needs to be matched with an appropriate level and distribution of specialist services nationwide.³⁰

It would be also be useful to have a better understanding of the knowledge and awareness levels among GPs. The current study invited a random selection of GPs from the wider Wellington region to attend a focus group discussion on these issues. However, only one GP responded favourably, others were too busy to attend. At the time of this invitation, New Zealand GPs were preparing to roll out a national strategy of immunising infants against Meningococcal-B, which the responding GPs reported had higher priority.

Nevertheless, the role of GPs in managing professional drivers with OSAS is an important one. Further emphasis on the doctor's role to advocate for this particular group of patients is necessary, and this could be endorsed through professional development education workshops about sleep and sleep related disorders.

Implications for public health policy

The Ministry of Transport and its respective transport regulatory agencies, the Accident Compensation Corporation, and the Department of Labour are working together through the National Road Safety Committee's inter-agency strategy to combat driver fatigue. One of their key activities is raising awareness about the dangers of sleepy driving, for both professional drivers and private motorists. This can be expected to reduce the acceptability of professional drivers being sleepy at work, and increase the demand for healthcare services to manage chronic sleep disorders, including OSAS.

The Ministry of Health needs to become involved in strategic planning of healthcare services to meet these needs. Taxi company managers also need to be educated about, and enforce safe driving policies, so that individual drivers feel supported and are reminded about adhering to such policies.

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Author information: Ridvan T Firestone, Pacific Research Fellow; Philippa H Gander, Director; Sleep/Wake Research Centre, Massey University, Wellington

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Correspondence: Dr Ridvan Tupai Firestone, Centre for Public Health Research, Massey University, Private Box 756, Wellington, New Zealand. Fax: +64 (0)4 3800629; email: r.t.firestone@massey.ac.nz

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