Shift work in policing and road safety

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Long read: Driving home from night shifts and the impact on road safety

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I joined West Yorkshire Police in 1996 and developed an interest in roads policing early in my career. I went on to serve on roads policing teams across two forces, prior to moving to a variety of different uniformed roles. My role in leading investigations into serious and fatal collisions is where I began to look more closely at driver impairment in its entirety, and more specifically at driver sleepiness, which led to my doctoral research. In my current role with the National Police Wellbeing Service, I now lead on sleep and fatigue.

Shift work will always be necessary in policing. However, it is known to cause sleep reduction and disturbances and is therefore associated with increased sleepiness, as well as increased risks of impaired decision making and performance degradation (Kecklund and others, 2016).

Sleepiness can be problematic, particularly when it affects drivers, where it can cause impaired ability and can ultimately result in serious and fatal road traffic collisions. Those driving for work purposes are potentially at heightened risk of exposure (Lee and others, 2016). People working in emergency services roles, such as policing, where high-speed, high-skill, but high-risk driving is required, are perhaps even more at risk.

Literature review

Sleep need

Humans usually experience sleepiness at least once in every 24-hour period, normally at night. The need for sleep varies widely, however the recommended amount for adults is seven to nine hours a night (Hirshkowitz and others, 2015).

Normal sleep consists of a series of repeating cycles, where intensity changes from being awake, to light sleep, deep sleep and dream sleep (rapid eye movement or REM sleep). There are normally

four to six cycles each night.

In shift workers, the changes in wakefulness patterns can cause desynchronisation and increased sleepiness while awake during the night. In addition, when trying to sleep through the day, the circadian system can kick in, causing us to wake before the sleep need has been satisfied. This results in a ‘sleep debt’ (Van Dongen, 2006).

Sleep debt can lead to sleep deprivation. Acute sleep deprivation of around 24 hours has been shown to cause impairment in line with a blood alcohol concentration of 100mg of alcohol per 100ml of blood – in other words, in excess of the current drink/drive limit for England and Wales (Dawson and Reid, 1997).

Shift schedules

Shift schedules are the source of much debate in policing, with many questions around the ‘best’ pattern. Everyone has a preference that suits them or their particular lifestyle at a given time. However, when it comes to wellbeing and minimising sleepiness and therefore risk, some shift patterns are better than others.

There are many ways in which to cover the 24-hour period. Historically, policing simply split those 24 hours into three periods of eight hours. In more recent times, research has provided evidence suggesting a better balance is needed between the needs of the organisation, call demand and the health and wellbeing of the workforce (Home Office, 2010).

There is no universally agreed ideal shift pattern for policing. However, there are recommendations that may minimise adverse effects of disrupted sleep. For example, a rapid forward rotating system, with few consecutive night shifts, shorter night shifts, sufficient time for rest between shifts and avoidance of extended shifts, usually prove favourable in reducing circadian disruption, sleepiness and fatigue (Knauth and Hornberger, 2003). Poorly designed shift working arrangements and long hours, which do not balance work demands with time for rest and recovery, result in unhappy staff, poor work output, fatigue, mistakes, ill health and the possibility of falling asleep at work (Shen and others, 2006). If this occurs while driving it can prove deadly.

The driving task

A tired person will be less alert, less able to process information and have slower reaction times. In general, cognitive performance becomes progressively worse with time on task or time awake (Wilkinson, 1968). Those who drive as part of their job, or who are shift workers, are at greater risk. In addition, there are higher reports of collisions while driving home from a night shift (Lee and others, 2016). Yawning, increased blinking, difficulty in concentrating and the vehicle wandering or driver oversteering are all signs of excessive sleepiness. When drivers notice these effects, they are already impaired (James and Vila, 2015).

Driving is automated to a certain degree for an experienced driver, due to well-practised behaviours. However, when the unexpected happens, the driver needs to be in a position to switch from automatic processes to controlled processes (Lundqvist, 2001) to take any necessary evasive action. Most information that a driver needs to react to is received visually. When driving, we have limited time to identify information, process it and make a decision how to deal with it, before physically acting on it (Shinar, 2017). Driving therefore includes a number of skills, including executive function, attention, working memory skills and psychomotor skills (Zicat and others, 2018).

There are a variety of cognitive tasks that can be used to safely replicate the required skills and demonstrate cognitive performance during the driving task. Some of these are touched on in the following section and further explanation can be found in Taylor (2020).

Despite research showing sleepiness could account for 20% of serious and fatal road traffic collisions, it is still believed these types of collisions are underreported (Jackson and others, 2011). This, in part, could be due to the difficulties in identifying sleep-related collisions.

Methodology

The overall study initially explored many aspects of police procedures and included submitting Freedom of Information Act (FOIA) requests to all forces regarding shift patterns, road traffic collisions involving officers and staff, training in driver fatigue and any specific policies or procedures. This was followed up with further exploration of police road traffic-related fatalities (Police Roll of Honour Trust, n.d.), particularly while commuting, along with further quantitative studies. Although it is not possible to give a complete overview of all the research conducted, I have focused here on the two main quantitative studies conducted.

A questionnaire-based survey was conducted in the Yorkshire and Humber region to examine experiences of officers and staff working different shift patterns. The study was open to all officers and staff, regardless of working hours. It should be noted that all shift patterns in the four forces in the Yorkshire and Humber region have now changed since the study was conducted. The study concentrated on commuting to and from work, and incidents or collisions that took place during the commute. It gathered and reviewed information related to experiences of driver sleepiness, shift patterns, driving incidents, commuting times and distances.

A second in-depth practical study was then conducted with 23 officers and staff from one of the Yorkshire and Humber police forces, in the workplace, where participants were following the 2x2x2 (two earlies, two lates, two night shifts and four rest days) shift pattern at that time. Participants were required to wear an ActiGraph (a watch-type device) to measure activity, along with sleep duration and quality for one complete shift cycle. They were asked to complete iPad-based cognitive tasks to replicate those used in the driving task. This was a battery of five tasks, taking around 10 minutes to fully complete the battery. These tasks tested psychomotor speed, visual tracking, working and visual memory, attention, complex scanning and vigilant attention. These tasks were repeated at the beginning and end of each shift.

Results

Survey findings

There were 523 responses to the questionnaire and the main findings were as follows.

- 86.5% of respondents recalled feeling sleepy while travelling to or from work.
- 5.8% of respondents stated they had been involved in a collision or road departure while travelling to or from work.
- 51.9% of respondents had been involved in a ‘near miss’ incident, such as a kerb strike, lane departure or almost had a collision.
- 95.7% of those ‘near miss’ incidents were while travelling home from work.
- 61.8% had been working a nightshift prior to the incident.

Further data analysis on the responses revealed that when compared to those with a commute of less than 30 minutes, those with a commute between 30 minutes and one hour were 1.8 times

more likely to be involved in a road traffic incident. Those with a commute in excess of one hour were over three times more likely to be involved in an incident.

Practical study

The practical study illustrated that while on night shifts, participants' sleep was significantly reduced, by two hours. This suggests that they were likely to be sleep deprived while driving home from a nightshift.

Results showed that, despite the randomised nature of the tests, learning effects may have been present in some of the tests, for example performance improved with practice. This is not unusual in these types of tests. However, the tests did show differences in cognitive performance at different times during the shift pattern. In addition, the psychomotor vigilance task (PVT) which was used in the test battery is not subject to learning effects (Basner and Dinges, 2011; Taylor and others, 2019). Concentration lapses (one of the primary outcome measures for this test) were evident in PVT and more frequent on night shifts. This illustrates poorer performance and is as hypothesised.

Conclusion

There were many gaps in FOIA information, which illustrates that there is work to do regarding police data gathering. The questionnaire study revealed many incidents that were sleep related and the dangers of longer commutes. Overall, results supported the 2x2x2 shift pattern, demonstrating that participants coped well, without being overly fatigued, despite the significant reduction in sleep on night shifts. This supports earlier literature suggesting that a rapid forward rotating shift system, with few consecutive night shifts, shorter night shifts and sufficient time for rest between shifts is favourable.

Recommendations

My aim is to get everyone home safely to their families at the end of the shift.

Managing and mitigating sleepiness and fatigue, and the external factors that contribute to it, helps support this. Sleepiness and fatigue have been shown to be a problem across many studies

internationally, yet weren't widely considered in UK policing prior to this study. In my thesis (Taylor, 2020), I provided a number of recommendations, some of which are still relevant, along with others that have come about as a result of further research in this field. Some points to consider include the following.

- Shift patterns, shift length and shift timings are important – adoption of shift patterns in line with Home Office recommendations should be considered. These are based on sound academic and practitioner knowledge (Home Office, 2004; Home Office, 2010).
- Regular night worker assessments should be offered in line with working time regulations (The Working Time Regulations, 1998).
- Training and education in sleep hygiene and managing shift work should be delivered and available at key career points.
- Individual preparation for shift work is advisable – register on the Oscar Kilo website (as outlined below) to access a whole host of resources.
- Policies and procedures should be considered to manage key fatigue and sleepiness issues and ensure a means of reporting incidents, without fear of repercussions.
- Consideration should be given to postings in terms of commute distances.
- Make it a team effort between organisations and the workforce to ensure we're as prepared as possible for shift work.

As one of the Oscar Kilo – National Police Wellbeing Service team, I have already progressed some of the above recommendations. I have also contributed to further research projects where needed to specifically guide this topic in Home Office forces and beyond. This involves developing toolkits and training in fatigue management and sleep disorder screening, facilitating webinars and inputs by other subject matter experts, and supporting forces with best practice around shift management.

Sleepiness and fatigue is just one area that contributes to overall wellbeing and we continually develop services, based on your responses to the annual national wellbeing survey, along with external best-available evidence.

Visit The National Police Wellbeing Service (Oscar Kilo) website to see some of the work that is going on in different areas.

- This article was peer reviewed by Sergeant Christopher Milburn, Durham Constabulary.

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