

A SURVEY OF PROFESSIONAL PILOTS' HEALTH AND WELLBEING

There is increasing concern about how professional pilots' working conditions affect wellbeing. **Marion Venus** outlines research on pilot wellbeing, suggesting that present flight time limitations may not prevent fatigue and could foster sleep problems.

KEY POINTS

- Research suggests that high numbers of professional pilots may be severely fatigued, with some reporting significant sleep problems and burnout. A majority of professional pilots keep flying despite fatigue and mental health issues, even after severe life events.
- We surveyed 1097 professional pilots to investigate how professional pilots' working conditions, schedules, work-related and psychosocial stress, sleep problems and fatigue can affect mental health, mood and wellbeing.
- Professional pilots' average fatigue scores were higher than reference scores for patients with clinical sleep-wake disorders (including insomnia) and significantly higher than healthy, non-pilot respondents. Around a quarter of pilots reported multiple sleep problems associated with flight duties and layovers.
- Fatigue and sleep problems were associated with symptoms of depression and impaired pilot wellbeing. Several factors were associated with pilots' worries regarding their Medical Class 1, job and livelihood.
- Many pilots preferred sick leave when unfit due to fatigue, because they feared negative consequences, perceived a lack of support, feelings of guilt, or feared of stigmatisation by their employer.

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on pilots to maximise productivity and keep flying as many sectors as possible. While the pilot-in-command remains responsible for every aspect of flight safety according to the Chicago Convention, high levels of fatigue can be a threat to flight safety.

Shiftwork and insufficient sleep are associated with higher levels of stress, degraded health and higher occupational accident risks. These risks relate to flight operations with irregular long shifts, jetlag, circadian disruption, and restricted sleep time (e.g., due to late arrivals, early starts, back-to-back rostering, and so on). The research findings give us cause for concern. For instance, research by Reis, et al (2016) surveyed 435 pilots of commercial Portuguese airlines and found that:

- 35% reported clinically relevant sleep problems
- 59% reported significant daytime sleepiness
- 90% reported severe fatigue.

Background

In Europe, the liberalisation of aviation led to rapid growth in air travel. The number of daily flights approximately doubled between 1992 and 2016, while the number of routes almost tripled within these years (Brannigan, et al.,

2019). This deregulation allowed the development of new business models, e.g., the emergence of low-cost carriers and new employment models. However, there are concerns that operators use legal flight-time limitations as goals, despite high levels of fatigue. So called 'pilot pushing' describes the pressure



Research by Aljurf, et al (2018) among 328 commercial airline pilots in the Gulf Cooperation Council found:

- 68% reported severe fatigue
- 34% reported excessive daytime sleepiness
- 67% reported having made mistakes in the cockpit because of fatigue
- 45% reported they had fallen asleep at the controls at least once
- 35% reported significant symptoms of depression

With nighttime flying and sleeping during the daytime after trans-meridian flights, circadian rhythm disruptions and lack of sleep can impair a pilot's mood. Early and late flight duties also result in more stress, more tiredness and more impaired mood compared with rest days.

Several studies have investigated professional pilots' mental health, which can be impaired by exhausting schedules, accumulated fatigue and roster-induced sleep restrictions. It has been found that 63% of professional pilots kept flying despite significant fatigue, mental health issues or after severe life events ('inappropriate presenteeism'), while 54% had gone on duty while sick least once ('sickness presenteeism') (Johansson & Melin, 2018). Demerouti, et al (2018) found that 33% of American short-haul pilots

questioned reported high burnout scores. However, there are flaws in fatigue research, which has sometimes used unsuitable and unreliable tools and methods.

Psychosocial and work-related stressors like low income, job insecurity, less experience on the latest aircraft type and hours of physical exercise were also neglected in previous research, yet these factors can significantly affect pilots' mental health and wellbeing.

Our Research

We wanted to investigate how professional pilots' working conditions, schedules, work-related and psychosocial stress, sleep problems

and fatigue can affect mental health, mood and wellbeing. In March 2019, we launched an anonymous online survey, which was answered by 1097 professional pilots. Pilots had to report their actual duty rosters, hours of physical exercise for the last two months, age, income, flight hours on their present type of aircraft, subjective job security, psychosocial stress, fatigue severity, sleep problems and mental health (depression, anxiety screening, wellbeing, common mental disorders).

In the last two months, pilots reported on average 63 flight hours and 112 duty hours, had flown 61 sectors with 2.3 standby days, 3.9 early starts and 4.5 night flights. Short- and medium-haul pilots reported on

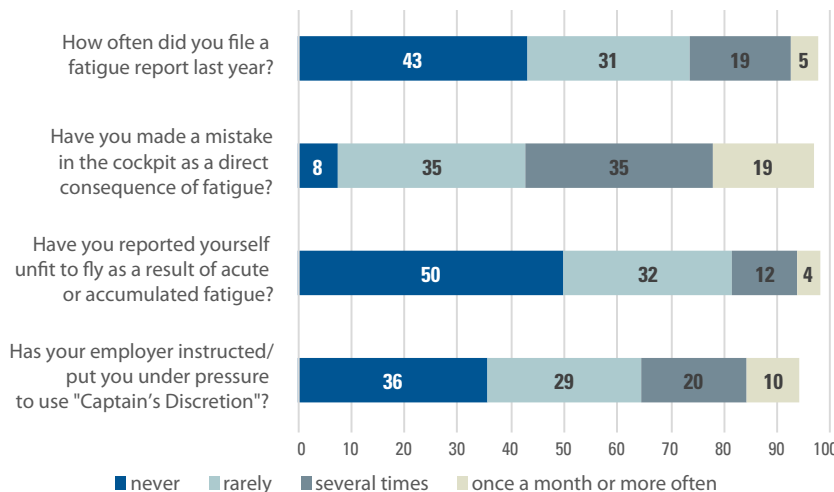


Figure 1: Professional pilots' fatigue in the cockpit, fatigue reports, and use of Commander's discretion

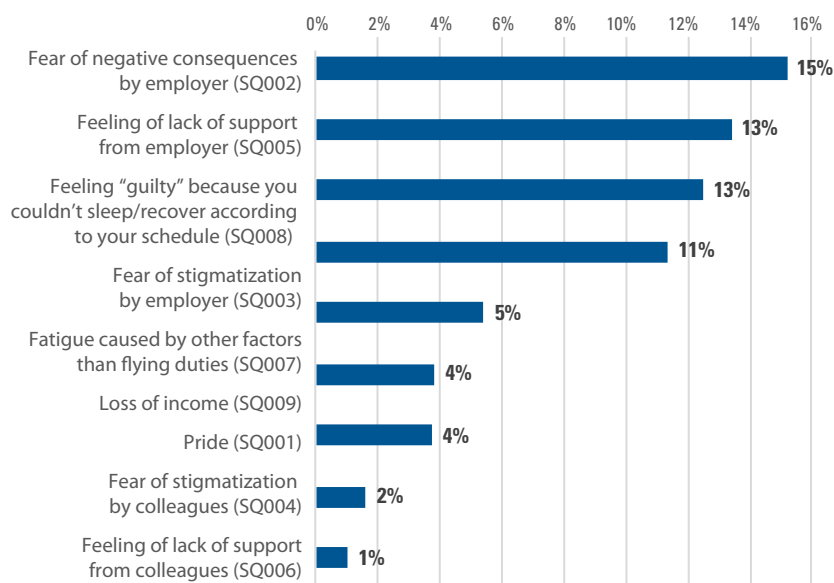


Figure 2: Why professional pilots prefer sick leave to fatigue leave (N=406)

How strongly do you agree with the following statements:

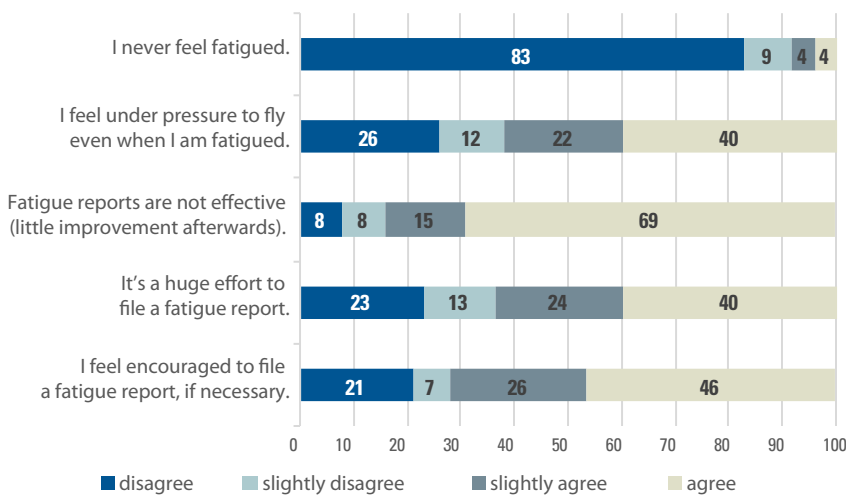


Figure 3: Frequencies of professional pilots' responses about fatigue and fatigue reports (N=406 professional pilots)

average 124 duty hours, 67 flight hours and 40 sectors, while long-haul pilots reported 101 duty hours, 67 flight hours and 10 sectors.

What we found

We found that 76% of the studied pilots reported severe fatigue. Professional pilots' average fatigue score was 4.5 on a scale from 1 (lowest fatigue score) to 7 (highest fatigue score). By way of comparison, reference values for fatigue were published by Valko, Bassetti, Bloch, Held, & Baumann (2008), who measured fatigue in patients and healthy subjects. The average fatigue score of patients with multiple sclerosis was 4.7, while patients after an ischaemic stroke reported a lower average fatigue score of 3.9. Patients with clinical sleep-wake-disorders (including insomnia) reported lower fatigue scores (4.3) than active professional pilots. Healthy respondents reported significantly lower fatigue with an average value of 3.0.

In our sample, 24% of pilots reported multiple sleep problems on eight or more nights every month, strongly associated with flight duty and layover. Also, 26% reported severe sleepiness on average 50 hours after their last flight duty. We found that

More fatigue and sleep problems were associated with more symptoms of depression and more impaired professional pilots' wellbeing.

psychosocial stress and more duty hours fostered sleep problems, while higher levels of psychosocial stress, sleep problems and more night flights significantly increased fatigue. More fatigue and sleep problems were associated with more symptoms of depression and more impaired professional pilots' wellbeing. More psychosocial stress, lower income, fewer hours on the present type of aircraft and job-insecurity were associated with pilots' worries about their Medical Class 1, job and livelihood.

Regulators recommend that pilots and operators should openly discuss fatigue, and fatigue management should be addressed without repercussions. According to the results of this research, the reality might be different. Data concerning fatigue and safety can be seen in Figure 1.

Professional pilots reported an average of 1.2 days fatigue leave and 6.8 days of sick leave. Many pilots preferred sick leave when unfit due to fatigue because they feared negative consequences, perceived a lack of support, or feared of stigmatisation by their employer (Figure 2). Some pilots felt guilty because they could not recover as rostered, while others preferred sick leave to avoid loss of income.

Of the pilot respondents, 79% agreed that fatigue reports are ineffective because of little or no improvement afterwards (see Figure 3), while 60% felt under pressure to fly when they were fatigued.

Fatigue itself is neither a physical nor a mental disorder, but an indicator that a person's functioning in different areas of life (e.g., overall motivation, work, family and social relationships) might be impaired. Commission Regulation (EU) 2018/1042 states, "Crew members are not to carry out duties on


an aircraft when under the influence of psychoactive substances or when unfit due to injury, fatigue, medication, sickness, or other similar causes." So, the question remains, when do fatigue and other health issues render professional pilots unfit to fly? As general guidelines, we might propose the following:

- Pilots must only fly when fit to fly, legal according to Part-MED. It is important to learn to say "No", before aeromedical examiners, employers or fellow pilots say "You do not look 'fit to fly'. I will not fly with you" or "I will not let you fly that fatigued."
- Pilots with doubts about their fitness to fly should ask a pilot peer, mental health professional or aviation clinical psychologist. It is hard to assess one's own fatigue, lack of sleep, exhaustion, and even mood, and the implications.
- Pilots are trained to manage threats or problematic situations in-flight

effectively. But sleep problems, accumulated fatigue and burnout often cannot be resolved quickly or without help. Both need professional treatment and proper recovery.

- Pilots and cabin crew often cannot obtain eight hours of good sleep before they start their flight-duties any time of day. Pressure to sleep can create more stress. This is relevant to regulators, operators and crew-planners.

Conclusion

These findings suggest that current flight time limitations may not prevent fatigue and could foster sleep problems. The findings also suggest problems of burnout, impairment of mood, depression and realistic worries about health and safety, despite flight-time limitations and mandatory fatigue risk management. Pilots, crew-planners, operators, regulators can act to reduce fatigue and its effects. 



Marion Venus started her career as work, clinical and health psychologist. After 10 years as health and safety manager in industry and aviation, she completed her PPL(A) in 2011. She started her PhD at the Department of Psychology of the University of Bern in 2017, entitled 'Pilots' working conditions, rosters, stress, sleep problems and fatigue, and how they can affect health and wellbeing'. Marion Venus is head of research and training at Venus Aviation.

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