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Sleep and fatigue among officers on board gas tankers

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Introduction

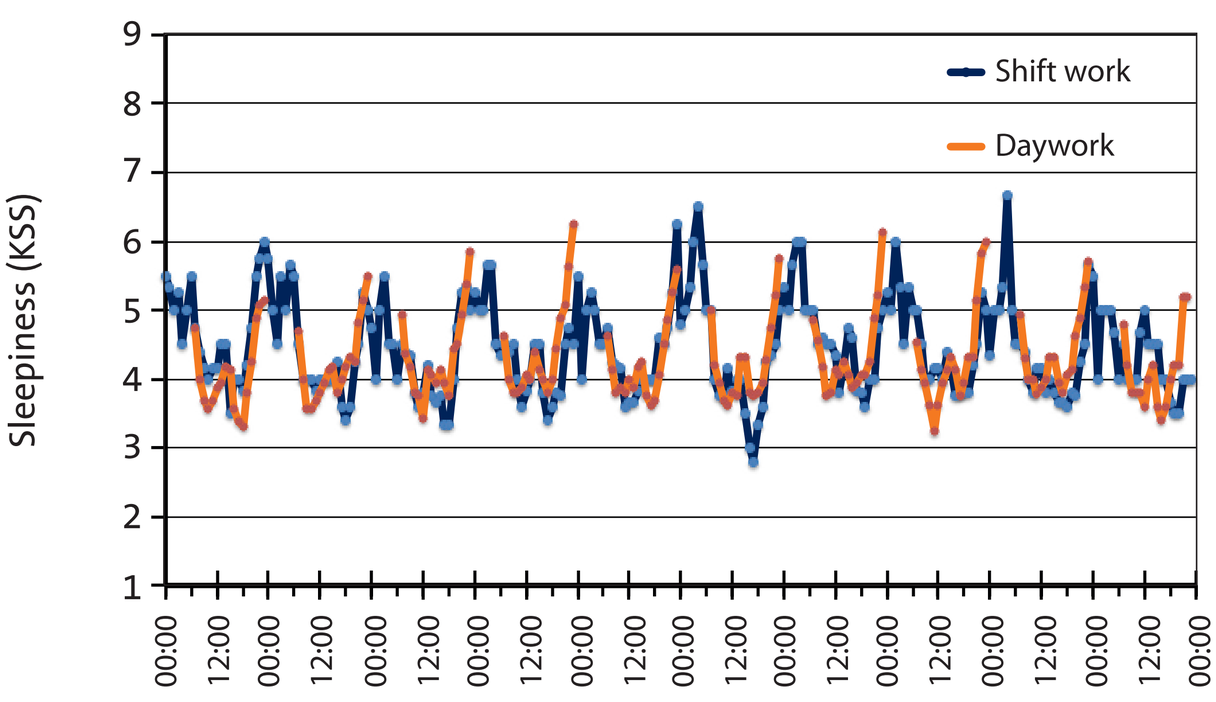
Fatigue is a growing safety concern in the maritime industry. Especially on board gas tankers, safety is of crucial importance. Therefore, this field study investigates sleep and sleepiness on board routinely operating gas tankers.

Conclusion

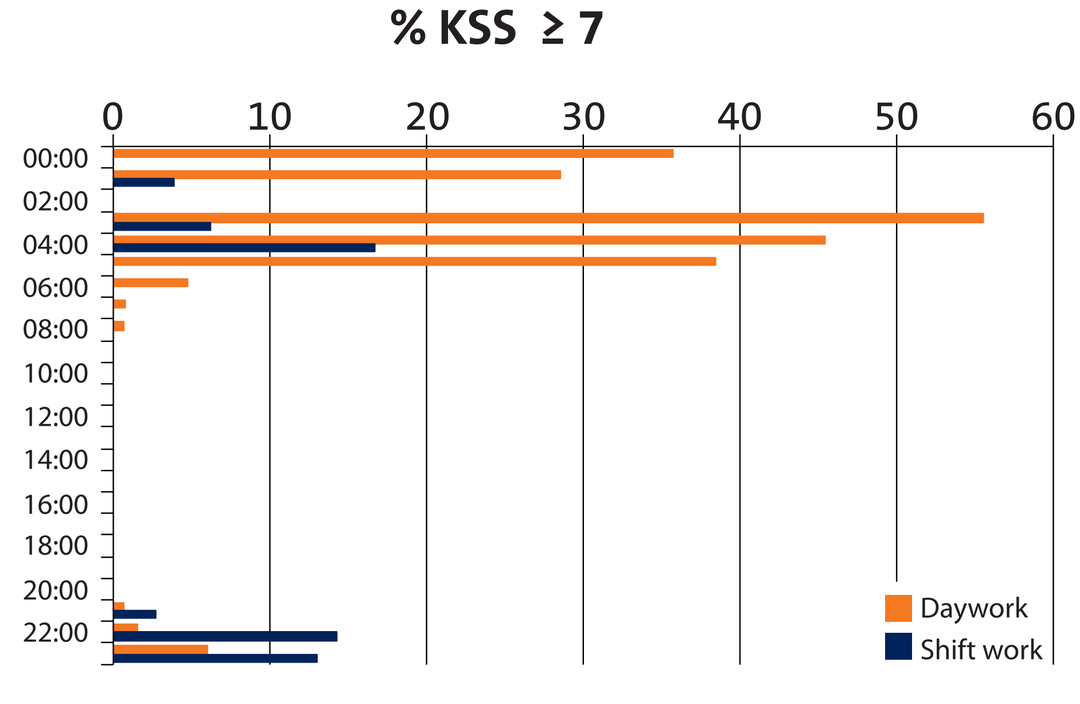
Highest sleepiness is reached in line with model predictions (i.e. around 4 AM). Although no sleep on duty was observed, the fact that neurobehavioural performance declined with time at work may be of risk.

Results

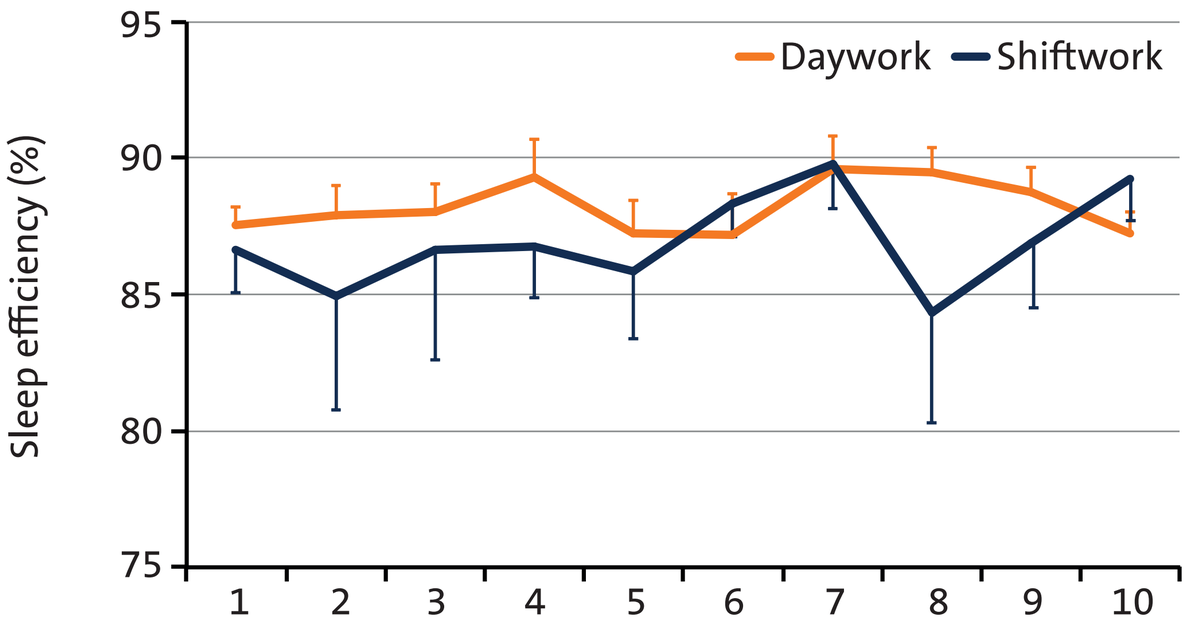
Sleepiness peaked around 4 AM in both shift workers (KSS=5.5) and day workers (KSS=6.2) and correlated well with model predictions (average r=.60, p<.001). Average sleep efficiency was 88% - with no difference between shift workers and day workers. Daily sleep duration was shortest in those working 08-12 (6 h), and longest in those working 00-04 (8 h). Day workers slept about 6.5 hours/day. Errors on the SART were most frequent at night and were 35% more frequent at the end of a working period compared to the beginning.



Sleepiness (KSS) during the 10-day voyage in both shift workers and day workers



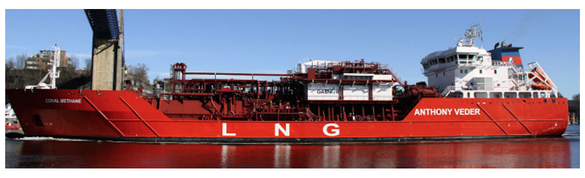
Prevalance of severe sleepiness (KSS ≥ 7) reported by both shift workers and day workers for all hours of day



Actigraphy based sleep efficiency (± SEM) during the 10 successive main sleep episodes at sea in both day workers and shift workers.

Method

22 officers working on 2 gas tankers (see photos) from a Dutch shipping company participated on a 10-day voyage through European waters, working either day work (n=16) or on 4h on/8h off watch system (n=6). Sleepiness (Karolinska Sleepiness Scale, KSS) was rated hourly, neurobehavioural performance (Sustained Attention to Response Task, SART) at the start and end of each work period. Sleep and sleep quality was assessed using actigraphy and diaries. Sleepiness ratings were also correlated to predictions based on the three-process model of alertness regulation.



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