Tenth International Conference on Managing Fatigue: Abstract for Review

Napping Strategies to Cope with Rotating Shiftwork

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Problem [100 words]

The degree to which shift workers experience and cope with problems arising from shift work differs, and this may be due in part to individuals employing varying coping strategies to deal with the negative effects of shift work. Napping, for example, has been identified as a coping strategy commonly used in the healthcare industry. Prophylactic napping or short naps on night shift may be an effective countermeasure for augmenting total sleep time (TST) and reducing extended periods of wakefulness. However, napping may be particularly beneficial for some workers and not feasible for others.

Method [250 words]

The aim of the current field study was to investigate whether napping was used as a coping strategy in a sample of shift working Australian nurses and midwives. The study also explored differences in nappers vs non-nappers, such as sleep flexibility, hours awake by the end of a night shift, and sleep on days off.

The Standard Shiftwork Index was completed by 134 South Australian hospital nurses and midwives working forward rotating shifts between October 2015 and March 2016. Surveys were completed anonymously online or in hard copy and took approximately 30 minutes. The survey included questions on total sleep time, napping, and other strategies used to cope with sleep problems caused by shift work.

Face-to-face interviews were conducted with a sub-set of 22 nurses and midwives. The semi-structured, in-depth interviews lasted for 30-60 minutes and asked about experiences of night shift work including preparation and recovery, and coping strategies within an individual's daily routine that were being utilised to deal with shift work.

Quantitative data from the Standard Shiftwork Index were analysed in order to examine the following variables of interest: Percentage of prophylactic and on-shift nappers; TST on days off and total time awake at the end of a night shift in non-nappers vs nappers; and sleep flexibility. In order to better understand how and why some shift workers choose to engage in specific sleep behaviours, interviews were examined for themes relating to sleep and naps.

Results [250 words]

Figure 1 (upper panel) shows reported TST by shift type. There were significant differences ($F_{11,572}$=21.9, p<0.001), such that compared to sleep between days off (reference), sleep before and between mornings, and between and after night shifts, was significantly reduced (p<0.001).

Nearly 70% of participants reported napping, with 30% reporting naps after morning shift, 22% reporting prophylactic naps prior to night shift, and 16% reporting short naps during their 45-minute night shift break (Figure 1, lower panel).

"my first night because I haven't had that sleep beforehand, at about 4:30 I've hit a brick wall so I'll take my…break and... fall asleep…"

Those who reported napping (mean=6.6±1.7) had significantly higher scores compared to non-nappers (mean=2.8±2.6) on sleep flexibility ($F_{1,95}$=18.74, p<0.001). Non-nappers reported that they find it difficult to fall asleep at unusual times or in unusual places, and that falling asleep in the workplace was difficult.

"the lights are on, but there's different hidey holes people go and find but I find it makes me feel terrible if I nap so I just prefer to power through."

By the end of the night shift, average hours of time awake was significantly different across nightshift napping groups ($F_{2,85}$= 97.2, p<0.001), such that non-nappers had significantly higher wake times compared to prophylactic and on-shift nappers (p<0.001, Figure 2, left panel). TST on days off was also significantly different ($F2_{,8}$=3.9, p<0.05), with those who napped on night shift reporting less TST on days off (Figure 2, right panel).

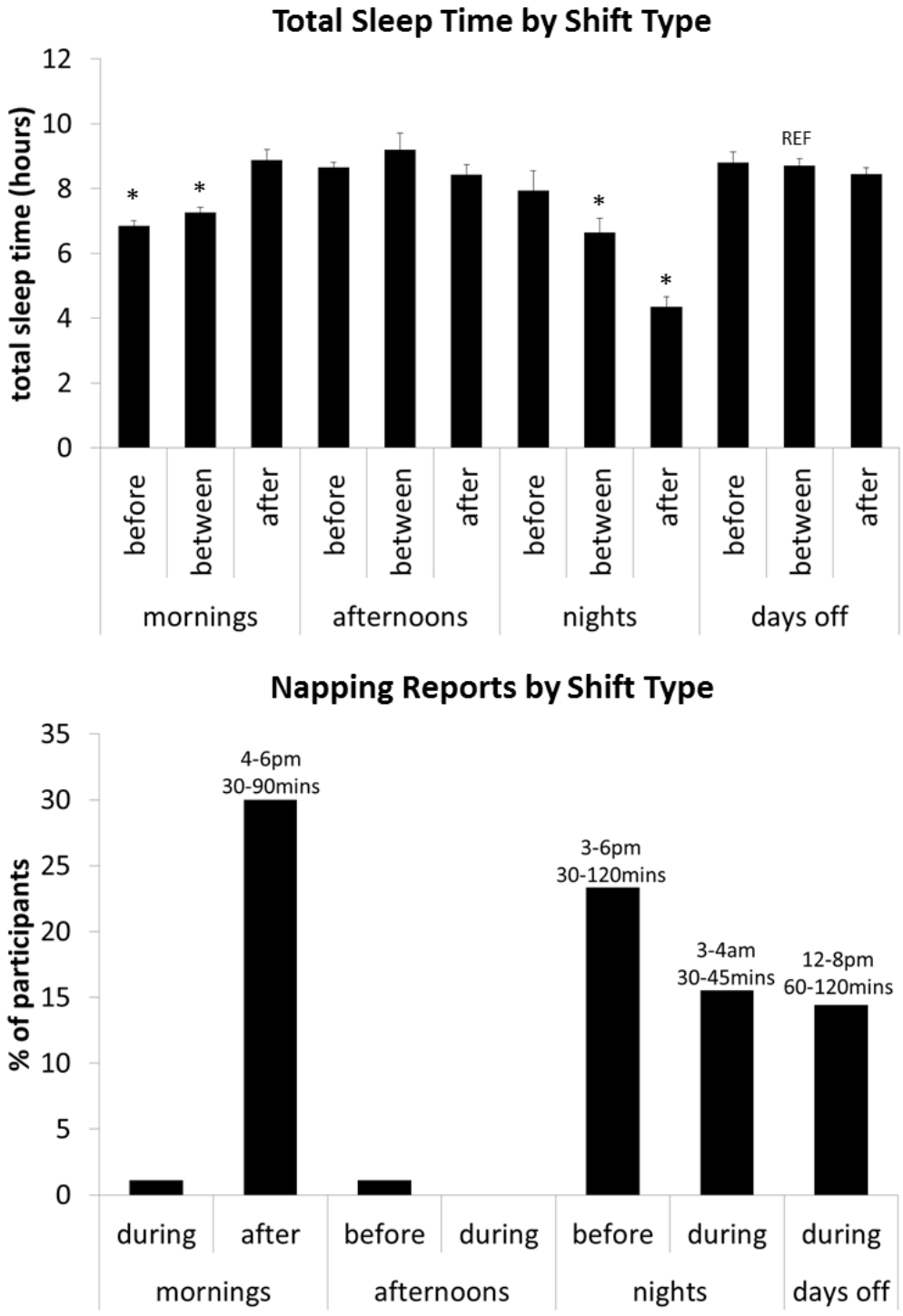

Figure 1. Upper Panel – Self-reported sleep times by shift type. *p<0.001 compared to sleep between days off (reference). Lower Panel– Percentage of participants who napped by shift type (morning, afternoon, night) and on days off. Time of day and nap durations also shown.

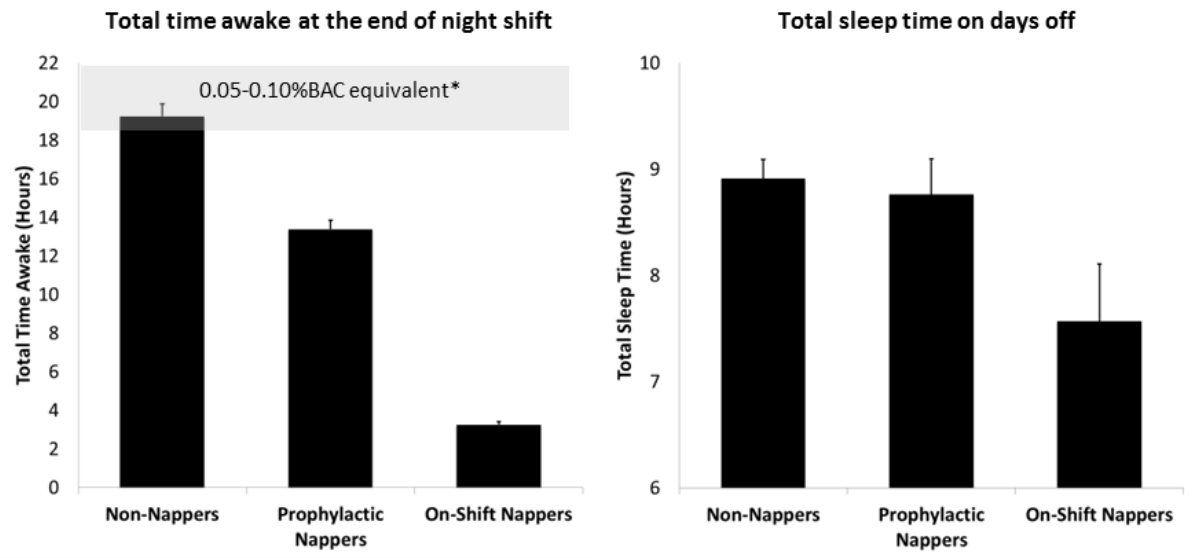

Figure 2. Left Panel – Wake times at the end of night shifts by nightshift napping group (non-nappers, prophylactic nappers, on shift nappers). Grey shaded zone shows BAC equivalent from studies comparing the effects of sleep loss and alcohol intoxication following a night awake (Dawson & Reid, 1997; Williamson et al., 2001). Right Panel – Total sleep times on days off by nightshift napping group.

Discussion [250 words]

Napping was common, especially following morning shifts and before and during night shifts. Napping reduced hours of wakefulness by the end of the night shift, which may improve safety outcomes given that non-nappers reported being awake for up to 24-hours at the end of the nightshift. This level of extended wake is equivalent to having a blood alcohol level of 0.05-0.10% - above the legal driving limit in Australia. Given that the roles of nurses and midwives are safety-critical, napping may be an advisable strategy. However, a laboratory-based study (Centofanti et al. 2015) found that a 30-minute nap opportunity ending at 04:00 did not improve cognitive function in the following hours. Participants in the laboratory study were well-rested and had only undergone one night awake; thus it is possible that a 30-minute nap around 04:00 may be more beneficial in shift workers who have a higher sleep debt.

TST on days off was lower for shift workers who reported napping on night shifts. It is possible that these participants use napping at work to catch up on sleep that they are unable to obtain at home, potentially due to environmental factors.

"*I live right next to a school, so…I hate sports days. There's one of the teachers who likes the megaphone…I'll get woken up, I don't know, every time the starter gun goes.*"

It also appears that sleep flexibility contributes to the ability to nap. Future studies should take this variable into account when designing napping interventions.

Summary [150 words]

Shift work can lead to a range of aversive health and safety outcomes due to its associated sleep disruption. Coping strategies differ between individuals but may help to explain why some people cope well with shift work while others do not. Therefore, this field study aimed to investigate whether napping was used as a coping strategy in a sample of shift working South Australian nurses and midwives. The study identified reasons that shift workers choose to nap or abstain from napping. Further research is required to help develop recommendations for shift workers regarding napping as a coping strategy, whilst taking into account the factors that may assist or hinder being able to nap - for example, conduciveness of sleep in the home environment and sleep flexibility.