

## ABSTRACT

Sleepiness has been consistently found to be a common problem in drivers, and its detrimental effects on vigilance and driving performance are well documented. However, naturalistic studies are limited, and this important health problem has not been studied in Hong Kong. In the present naturalistic study, a group of professional drivers, specifically taxi drivers, served as the participants because local statistics revealed their higher vulnerability to traffic accidents. The purposes of the present study were to (1) examine how sleepiness as well as vigilance and driving performance of taxi drivers varied within one shift and whether these changes differed between daytime and nighttime drivers, (2) investigate whether matching drivers' shift with their circadian typology was beneficial to drivers' sleep, (3) examine the mediating role of sleepiness in the relationship between disturbed sleep and vigilance and driving performance, and (4) determine whether exposure to bright light facilitated work adaptation of nighttime drivers. Thirty-two urban taxi drivers (16 daytime and 16 nighttime) were recruited after initial screening for their circadian type. Results showed that (1) both daytime and nighttime drivers showed deterioration in their subjective alertness, but improvement in vigilance and driving performance throughout a shift; (2) for daytime taxi drivers, the more morning-typed they were, the higher their sleep quality was, and for nighttime taxi drivers, a similar trend between high eveningness and high sleep quality was observed; (3) sleepiness did not mediate the impact of disturbed sleep on vigilance and driving performance; and (4) bright light exposure impaired drivers' vigilance and simulated driving performance, and it failed to help drivers maintain their alertness throughout a shift. The present study has both theoretical and practical significance: job performance should not be

incorporated into the theoretical model about shift work adaptation proposed by Barton and her colleagues (1995); it is possible that matching shift and circadian type is associated with improved shift workers' sleep; and very brief bright light exposure impairs job performance of permanent night shift workers who are used to working in a dark environment.