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ORIGINAL ARTICLE

Quiet time for mechanically ventilated patients in the medical intensive care unit

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KEYWORDS
Critical care;
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Summary
Objective: Sleep disruption occurs frequently in critically ill patients. The primary aim of this study was to examine the effect of quiet time (QT) on patient sedation frequency, sedation and delirium scores; and to determine if consecutive QTs influenced physiologic measures (heart rate, mean arterial blood pressure and respiratory rate).
Method: A prospective study of a quiet time protocol was conducted with 72 adult patients on mechanical ventilation.
Setting: A Medical Intensive Care Unit (MICU) in the Midwest region of the United States.
Results: Sedation was given less frequently after QT ($p = 0.045$). Those who were agitated prior to QT were more likely to be at goal sedation after QT ($p < 0.001$). Although not statistically significant, the majority of patients who were negative on the Confusion Assessment Method (CAM-ICU) prior to QT remained delirium free after QT. Repeated measures analysis of variance (ANOVA) for three consecutive QTs showed a significant difference for respiratory rate ($p = 0.035$).
Conclusion: QT may influence sedation administration and promote patient rest. Future studies are required to further understand the influence of QT on mechanically ventilated patients in the intensive care unit.

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Implications for Clinical Practice

- The use of a quiet time or uninterrupted period of rest may decrease the need for sedation in critical care.
- Findings from this study support quiet time as a safe (no increase in delirium) and beneficial nursing intervention in critical care.
- Nursing staff expressed satisfaction with quiet time. Decreased sound and light within the critical care environment may not only be beneficial to patients, but nurses as well.

Introduction

Critically ill patients frequently experience sleep disruption and poor sleep quality (Kamdar et al., 2012a; Trompeo et al., 2011). The intensive care unit (ICU) environment contributes to sleep interruptions due to frequent patient waking for tests, procedures and treatments (Figueroa-Ramos et al., 2009; Konkani and Oakley, 2012). Additionally, critical illness and the associated immunological, hormonal and metabolic derangement increase the frequency of awakenings from sleep (Tamburri et al., 2004). ICU patients have reduced rapid eye movement (REM) sleep, frequent care interactions that interrupt sleep and patients have expressed the desire for improved sleep (Garbor et al., 2003; Tamburri et al., 2004; Tembo et al., 2013). A consequence of sleep disruption is delirium, which extends time in critical care, increases mortality and may lead to long-term cognitive dysfunction (Desai et al., 2013; Girard et al., 2010; Lin et al., 2004; Thomason et al., 2005). Developing and testing protocols that promote uninterrupted sleep for critical care patients is an important area of nursing research.

Background

Fatigue associated with sleep disturbance can cause respiratory muscle dysfunction and prolonged mechanical ventilation (Fontana and Pittiglio, 2010; Tembo and Parker, 2009). Modes of mechanical ventilation may also contribute to sleep disruption (Delisle et al., 2011; Parthasarathy and Tobin, 2002). Sleep is frequently interrupted during ventilatory support due to desynchronised breathing, endotracheal tube pain and communication challenges with staff (Nakos, 2011; Patel et al., 2008; Tembo and Parker, 2009).

Delirium may be related to sleep disruption. Prevalence rates for delirium in mechanically ventilated patients are 60—80% (Desai et al., 2013). Sleep disturbance and the administration of benzodiazepines are delirium risk factors (Figueroa-Ramos et al., 2009; Weinhouse et al., 2009). In a study of surgical intensive care patients delirium and lorazepam dosage were independently associated with significantly reduced REM sleep (Trompeo et al., 2011).

Providing a quiet time (QT) for patients is a strategy to address sleep disruptions in hospitalised patients (Bartick et al., 2010; Dennis et al., 2010; Gardner et al., 2009; Maidl et al., 2013; Olson et al., 2001). A QT is defined as a period of time in which there is a reduction of light and sound and interruptions are minimised within the patient's room (Dennis et al., 2010; Gardner et al., 2009; Maidl et al., 2013; Olson et al., 2001). Improved patient sleep, reduced noise and increased satisfaction for patients, family and staff are positive outcomes associated with QT in settings outside the ICU (Bartick et al., 2010; Gardner et al., 2009).

When a QT intervention was implemented twice daily for neuro-critical care patients (Dennis et al., 2010; Olson et al., 2001), noise and light were significantly lower and patients were more likely to be sleeping during QT. A daily QT in cardiovascular and neurosciences ICUs resulted in higher patient ratings of sleep and lower anxiety levels (Maidl et al., 2013). Additionally, 93% of the patients in the study reported that QT was important.

No studies to date have examined the impact of QT on delirium and sedation use in mechanically ventilated patients. This study aimed to explore the influence of a QT on the mechanically ventilated patient population in a medical ICU (MICU).

Topf's Environmental Stress Model (ESM) guided the study. Noise in the environment creates ambient stressors with physiological and psychological consequences on the person (Topf, 2000). QT, by decreasing noise and patient interruptions, may improve the quality and quantity of patient sleep, decrease the analgesic and sedatives medication administration and decrease delirium (see Fig. 1).

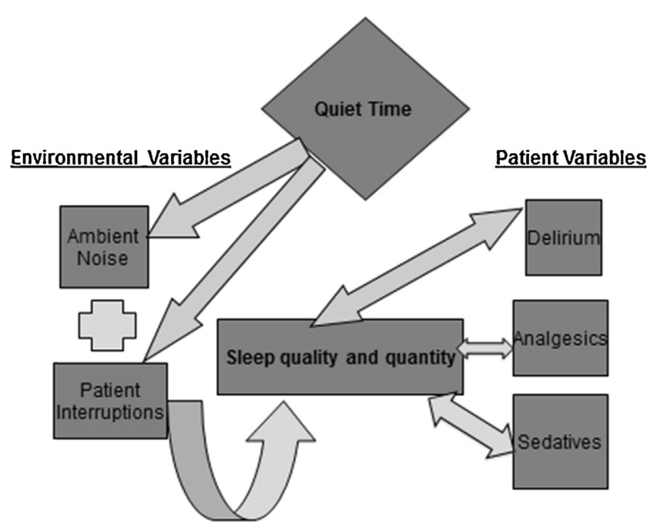

Figure 1 Effect of quiet time to reduce the noise and interruptions for nursing care/tests and procedures (environmental variables) in relationship to the potential effects of individual variables on the quality and quantity of sleep. Conceptual framework modified from the theoretical underpinnings of Topf's Environmental Stress Model (Topf, 2000).