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Quiet Please: The effects of sleep quality and quantity as a result of a QI project to minimize nighttime interruptions

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Background

- Sleep: restorative; crucial for mental and physical health. Adverse effects of sleep deprivation include impaired healing, altered immune function, increased risk for infection, and hyperalgesia.
- Sleep deprivation in hospitalized patients – contributes to experience of more pain the next day, increased cortisol and catecholamine levels, hypertension, hyperglycemia, and exacerbates pain and anxiety¹.
- Common hospital sleep disruptions include: provider rounding, diagnostic testing, medication administration, alarms, noises, lights, pain, stress and anxiety, blood draws, and vital sign (VS) checks.
- Prospective cohort study with > 50,000 patients determined that 45% of patients awakened overnight for VS checks had a modified early warning score (MEWS) ≤1. Patients with MEWS ≤1 had a less than 1% chance of an adverse event².
- Greater than 40% of hospitalized patients reported the #1 cause of sleep disruption was hospital staff³.
- In 2016, a QI project began to minimize night-time sleep interruptions in a low risk subset of patients. Inclusion criteria was based on age, PEWS, other factors. Passive “hands off” vitals were performed at 4AM and labs were rescheduled to before 12AM or after 6AM. The study found that none of the eligible patients required a higher level of care or RRT activation.
- OBJECTIVE:** To compare total sleep time, sleep interruptions, and sleep quality in patients eligible for passive VS and those not eligible between July 2019 through November 2019.

Methods

- Inclusion Criteria:**
 - ≥ 5 years old
 - General Level of Care
 - Pediatric Early Warning Score (PEWS) ≤ 2 at 8PM and 12AM
- Exclusion Criteria:**
 - Admitted to surgical services
 - PEWS ≥ 3 at 8PM or 12AM
 - Received opiates in the last 12 hours
 - Infusions or other medications/ interventions that require frequent VS monitoring
 - Request by parent or physician for 4AM VS
- Surveys were distributed to eligible and not eligible for passive VS
- Data collected included:
 - Total sleep time
 - Number of night-time awakenings
 - Number of night-time awakenings attributed to hospital staff
 - Reasons for poor sleep
 - Rating of overall sleep quality
 - Rating of overall feeling of tiredness upon waking
- The Non-eligible Group had a 58% survey response rate, as 56 out of 97 identified patients completed the survey. The Eligible Group had a 72% survey response rate, as 48 out of 67 identified patients completed the survey.
- Data was analyzed using Chi Square Test

¹Pain. 2001;92:381–388.
²JAMA Intern Med. 2013;173(16):1554-1555.
³Journal of Hospital Med. 2010;5(3):E20-E24.

Tables and Graphs

Hours	Patients who were Not Eligible	Patients who were Eligible
0-2.9	0	2
3.5-9	21	10
6-8.9	28	25
9+	6	9
TOTALS	55	46

$p = 0.1157$

Table 1: Total number of hours of sleep reported by participants who were Not Eligible and Eligible for “passive vitals”

Number of awakenings by hospital staff	Patients who were NOT eligible	Patients who were Eligible
0	4	6
1-2	23	23
3-4	15	12
5-6	8	5
7-8	3	0
>8	2	2
TOTALS	55	48

$p = 0.5539$

Table 3: Total number of nighttime awakenings reported by participants that were attributed to hospital staff in those eligible and not eligible for “passive vitals”

Comparison of overall tiredness	Patients who were NOT eligible	Patients who were Eligible
1 = less tired	9	6
2	10	11
3	13	11
4	9	7
5 = more tired	4	7
TOTALS	45	42

$p = 0.7759$

Table 5: Comparison of overall level of tiredness between current admission and previous admission in participants who were not eligible and eligible for “passive vitals”

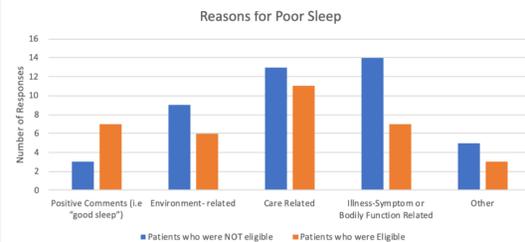


Figure 1: Patient responses regarding reasons for poor sleep grouped by overall theme.

Number of Nighttime awakenings	Patients who were NOT Eligible	Patients who were Eligible
0	4	6
1-2	17	13
3-4	20	17
5-6	9	6
7-8	3	3
>8	3	3
TOTALS	56	48

$p = 0.9479$

Table 2: Total number of nighttime awakenings reported by participants who were eligible and not eligible for “passive vitals”

Comparison of Sleep Quality	Patients who were NOT eligible	Patients who were eligible
1= better, restful	5	9
2	13	11
3	19	12
4	9	5
5 = worse	0	4
TOTALS	46	41

$p = 0.1003$

Table 4: Comparison of sleep quality in participants who have had previous hospitalizations reported by those who were eligible and NOT eligible for “passive vitals” during the current admission.

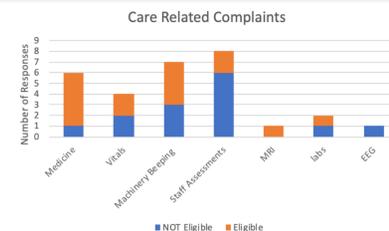


Figure 2: Patient responses further categorized into subsets by frequency within the theme of care related complaints.

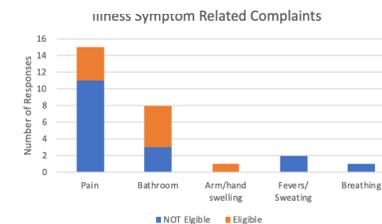


Figure 3: Patient responses further categorized into subsets by frequency within the theme of illness symptom related complaints.

Results

- The total sleep time between groups was not statistically significant, and both groups reported similar total sleep times (Table 1).
- The total # of night-time awakenings between groups (Table 2) and the # of awakenings attributed to hospital staff (Table 3) were similar and not statistically significant.
- Rating of sleep quality between both groups (Table 4) and rating of overall sleep tiredness in both groups (Table 5) compared to previous hospitalizations was not statistically significant. Both groups tended to report the current stay as neutral to more restful (score 3- 5) on the five point scale. They also reported feeling less tired to neutral range (scores 1- 3) on the five point.
- Qualitative data was grouped based on theme such as environment related, care related, illness symptoms or bodily function related, and others. Figure 1 shows reasons for poor sleep grouped by overall theme. Care related and illness symptom-related complaints were most commonly cited among both groups. Staff assessments were cited more frequently as a disruption in the non-eligible group (Figure 2). Pain was cited more frequently as a disruption in the non-eligible group (Figure 3).

Conclusion

- No statistical difference in total hours of sleep, number of sleep interruptions, sleep quality, and subjective rating of tiredness was found.
- The most frequent contributing factors to sleep interruption were care related, pain and symptom related, and environmental related complaints.
- Limitations include a small sample size. The survey format also introduces reporter bias. Additionally, the day on which patient was surveyed could represent a very different experience compared to other points during hospitalization.
- Next steps should include focusing on treating pain and symptoms, re-timing lab draws, and moving toward private rooms.