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Naps: A new approach to decrease patient adverse outcomes

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Nap: A Benchmark Study

A Paper Submitted in Partial Fulfillment of the Requirements

For NURS 5382: Capstone

In the School of Nursing

The University of Texas at Tyler

by

Ayesha Lakhani

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Executive Summary

Most nurses are employed as bedside nurses in hospitals, and generally nurses work twelve-hour shifts. (Schnur, 2020). However, they rarely work just their assigned twelve hours. Often, they stay late to either finish charting or finish completing their tasks which is why nurses often work beyond their twelve-hour shifts. In addition to this, the severity of patients has also worsened over the years; every patient has several comorbidities which a nurse must treat in addition to the admitting primary diagnosis. This exacerbated during the pandemic; hospitals were overflowed with patients and did not have enough staff to cover them. Due to this, nurses have become overworked, exhausted, and sleep deprived, and consequently, patient care and patient safety is affected due to an increase in errors (Aiken et al., 2004).

The current resolution that is practiced is hiring more full-time staff or contract staff. Managers even offer more bonus contracts or bonus shifts to counteract those issues. However, all these options are costly and do not offer a permanent solution. Naps have shown to help decrease the side effects of long working hours and a heavy workload in many fields, such as aviation (Giriprakash, 2021). This can also be applied to nursing. In combination with naps being a low-cost solution, they can help reduce staff's fatigue, exhaustion, and promote patient safety. However, this is not a norm, even a taboo, in the nursing field. Therefore, to create this change, the recommendation is to follow the guidelines and pilot this study on a specific department to assure leadership the various benefits of napping and consequently create a new culture of allowing staff to nap to promote patient safety and satisfaction.

Nap: Benchmark Project

Twelve-hour shifts have become the norm in healthcare, as is working beyond them. To compensate the increase in patients, workload, and a lack of staff, managers offer bonuses and other incentives to get staff to work extra shifts. Since there is no law in Texas limiting the amount of shifts a nurse can work in a row if it is considered voluntary, many nurses are being over worked (Institute of Medicine, 2004). This is causing them to become fatigued, sleep deprived, and exhausted which affects patient care and safety. This benchmark project will allow staff to nap to alleviate side effects of working long hours and improve patient safety.

Rationale for the Project

When patients arrive to the hospital, they expect staff to provide safe and efficient care. However, when staff members are exhausted and not alert, they can easily make mistakes which can have detrimental effects on a patient's health, even death. Such a thing happened to a patient from Vanderbilt University Medical Center where a nurse mistakenly gave a patient Vecuronium instead of Versed which paralyzed and killed the patient (Kelman & Tamburin, 2019). Even if it is not such a dire mistake, inefficient and unsafe care can cause hospitals to receive low patient satisfaction scores in their Hospital Consumer Assessment of Healthcare Providers and System (HCAHPS) Surveys (Centers for Medicare and Medicaid Services [CMS], 2021a). A lower HCAHPS score results in lower reimbursement for the hospitals through Center for Medicare and Medicaid Services (CMS, 2021b). Also, since HCAHPS scores are published publicly, patients are free to choose a hospital with the higher score (CMS, 2021a). Hospitals are also impacted financially when patients acquire complications in their care, such as pressure ulcers, due to inefficient care because patients are not responsible to pay for all care associated with those complications (Wolters Kluwer, 2018). Therefore, it is beneficial for a hospital's

leadership to invest in a program which helps staff to prevent such mistakes and consequently improve patient outcomes and hospital's finances.

Literature Synthesis.

Many databases were searched, and literatures were reviewed which resulted in twelve total articles that showed the effect of long working hours and importance of nap on staff and patient outcomes. Five of the twelve articles which compared the effects of long working hours and overtime on patient outcomes suggested that the more hours a staff member worked, the more the staff made errors causing an increase in adverse patient outcomes. Clendon and Gibbons (2015) showed a positive correlation between staff working twelve-hours or more and errors. Their research showed an increase in adverse patient outcomes such as care left undone, medication errors, and central line bloodstream infection (Clendon & Gibbons, 2015). This was mirrored by Kunviktikul et al. (2015) and Cho et al. (2016) who stated working beyond the full-time requirements caused a higher rate of patient identification errors, patient complaints, and care left undone. They also reported an increase in fatigue, depersonalization, communication error and a decrease in intent to stay. Lobo et al. (2010) and Muzio et al. (2019) also reported an increase in fatigue, depersonalization, lower levels of alertness, and poor quality of sleep.

The rest of the seven articles measured various napping times against many factors such as fatigue, sleepiness, quality of sleep, quality of care, drowsy driving, probe memory recall, and errors; however, they all had a consensus – naps improve outcomes. Han et al. (2021), Smith-Coggins et al. (2006), Maria de Arójo et al. (2015), Oriyama et al. (2014), Ruggiero et al., (2014) all stated that naps help decrease sleepiness, fatigue, real time drowsiness, drowsy driving, and errors decreased, and at the same time quality of care and levels of alertness increased. The only variations were reported by Smith-Coggins et al. (2006) who reported a temporarily decrease in

probe memory recall and by Oriyama et al. (2014) who reported a slight lower level of sleepiness at work in the no nap control group. The other two articles measured naps in combination with other interventions. One such study was conducted by Scott et al. (2010) who measured naps in a combination of break, coffee, and physical activity against fatigue, sleep quality, and errors which showed that sleep quality increased, patient errors decreased, and drowsy driving after work decreased as well. However, it also reported a slight worsening in sleepiness post intervention. Another mix intervention was used by Van Woerkom et al. (2020) who used naps as well as light therapy glasses and napping facility, and this showed that having a mere napping facility did not affect adverse effects. If nurses did nap, glasses, or both, it showed a decrease in fatigue and an increase in psychological well-being (Van Woekom, 2020).

Project Stakeholders

The stakeholders of this project are patients and their families, staff, and administrators. Bedside staff, especially nurses, are one of the major stakeholders of this project. They are responsible and liable to multiple patient's safety and care simultaneously. They must juggle patient care, communication with family, doctors, and managers, complete charting efficiently, and participate in other mandatory work requirements they may have. Any error can cause a nurse to get suspended at best or lose their license and face jail at worst. An example of this was nurse Vaught who accidentally killed a patient by administering Vecuronium instead of Versed and as a result was charged with reckless homicide (Kelman & Tamburin, 2019). Hence, patients are also stakeholders. When patients and their families arrive in the hospital, they expect the efficient care and quality treatment. They do not want any delay or any errors in their care; however, when staff is not alert and fatigued, patients' safety and care is compromised (Lobo et al., 2017).

Consequently, patient ratings and HCAHPS scores are also affected which affects a hospital's reimbursement (CMS, 2021a, 2021b). In case of nurse Vaught and the Vanderbilt University Medical Center, CMS threatened to withhold any reimbursements if changes were not made immediately (Kelman & Tamburin, 2019). Therefore, it is imperative for staff, patients, and administrations to have nurses and nurses' aides be alert and well rested.

Implementation Plan

Due to the rise in COVID, this project was not able to be implemented, but I will detail how to implement it step-by-step. The implementation plan is based on a 12-week timeline. Before beginning, one must recognize a need for change: has the patient satisfaction on your unit decreased, have there been more adverse patient outcomes lately, and are the staff feeling exhausted and not alert? If so, one should initiate this project. The first step is to gain permission to implement the project on floor or unit. To gain permission, the master prepared nurse should approach the nurse manager of a unit and present the project as a pilot. The project would also need the approval of the director of the unit and or the chief nursing officer as well. It is important to gain the trust of these stakeholders by emphasizing the benefits and low costs associated with this project to ensure a successful implementation. Step two would begin with developing a team. The team would include the lead evidence-based practice (EBP) nurse, an educational nurse, and a member of the administration such as a manager or the director. Step three would start by educating staff about the project, its purpose, and analyzing and removing any biases and any ethical concerns the staff may have by having open discussion forums twice a day for a week to include participation from both day and night shift staff.

Step 4 would be the actual implementation stage of the project. This would be over a period of four weeks. At the beginning of each shift, the charge nurse will pair all the staff

members and stagger their nap times (person A from pair 1 goes first, person A from pair 2 goes next...). This ensures that not everyone will nap at the same time, and when one does, his or her patients are taken care of. The length of the nap is 30 minutes to help prevent possible sleep inertia (Geiger-Brown et al., 2016). Naps will be taken in a designated room near the floor which is dark and cool, with an alarm clock or timer, reclining chair, linen, and pillow. The nurse will leave her phone with the “buddy” to ensure an uninterrupted rest time. Once the nap time is done, the buddy is responsible to ensure that the nurse is awake and has returned to work. Naps would be taken between 1am to 4 am, ensuring that everyone is awake and alert for the end of shift tasks.

Step 5 would be to evaluate the effectiveness of the project (see data collection methods), and Step 6 would be to present the results to the stakeholders to convince them to turn the project into a policy and implement throughout the entire hospital.

Timetable/Flowchart

This project was originally scheduled to be implemented from January 2022 to April 2022. However, due to the new variant of COVID-19, all pilot projects were put on hold due to its’ overwhelming effects, hence the benchmark. The major events of this project are aligned with the timetable presented below with corresponding dates and are also consistent with the flowchart on Appendix B.

Benchmark Timetable: Nap
Week 0: Recognize a need for change. (Step 0)
Week 1: Begin with gaining permission for change and gain trust of stakeholders (step 1)

Week 2: EBP lead nurse will begin to develop a team. It should include an educational nurse, a member of the administration (manager or director), and floor nurses (step 2)
Week 3: Educating staff about the project, encouraging participation, answering questions, removing biases and ethical concerns (step 3).
Week 4-8: Implementing the project, and the EBP team will answer questions or concerns simultaneously (step 4).
Week 9-10: Evaluate the results of the project, conduct interviews (step 5)
Week 11-12: Present the project and results to stakeholders (step 6).

Data Collection Methods

To evaluate the effectiveness of naps, a survey will be conducted at the beginning of and end of each shift (see Appendix D). This would evaluate things such as their level of tiredness, how many hours they have already worked, did they nap, how they feel post napping, and has the number of errors or near-miss errors increased or decreased. By doing so, I will be able to evaluate if a) naps were effective or not and b) if the mean number of errors or perceived near miss errors increased or decreased? Some of the answers will be transferred to an Excel spreadsheet for easier access (see Appendix C). In the end of the project, the average amount of errors and near miss errors during week 1 versus week 4 will be calculated. Week 1 is expected to have minor issues and concerns to resolve; therefore, the number of errors made may not actually reflect the effectiveness of naps. This can act as the pre-napping data. By week 4, all issues should be resolved; therefore, the data can truly show the correlation between naps and errors. Hence, by comparing the means of week 1 to week 4, the EBP team could conclude if naps helped decrease errors and near miss errors or not. The EBP team can refer to the surveys

for details such as for nurses who made errors: what were they feeling (sleepy or fatigued) and how many hours they have worked.

Towards the end of the project, I will also conduct interviews with all the participants. These interviews would give me details of all the near-miss errors, if naps helped to decrease them, and other topics such as what worked and what did not work. The interviews, combined with the results on the surveys, will be transferred to a descriptive word format to find common themes in the project. For any actual error, an ERS report would be filed, per protocol. ERS reports would be followed up each week with the manager to see who reported it and if they participated in the project. If they did, their ERS report would be correlated with the survey to see if a) did the error occur during the day they napped b) did the error occur before or after the nap c) did the nap help or hinder their work performance.

In the end if the project is effective, there should be an increase in staff who take naps. This should be correlated to higher levels of alertness, lower levels of fatigue, sleepiness, and rest post-nap. As a result, patient outcomes should also improve. There should be fewer errors and an increase in patient satisfaction scores.

Cost/Benefit Discussion

The costs associated with this project are minimal, \$1,000 - \$10,000. To minimize costs as low as possible, a small office or a closet that is being used a storage area can be reused as the designated napping area. Hospitals break rooms or waiting areas usually have a lounging sofa chair available. For this project, the EBP team should reach out to the department manager to utilize it in their napping area for the pilot. Linen, such as pillow and blankets, can also be provided by the hospital. The only equipment that needs to be purchased is the alarm clock which should be \$50 maximum. Additional costs associated with the project are those of

educating the staff. Since education will be provided twice a day, staff would have to be paid for those education sessions. By using an average hourly rate of \$36.00 a nurse and a unit employed by about thirty nurses, one hour of education for all the nurses would equal \$1,080. Since education sessions are offered twice a day and the first one is introducing the pilot, the total cost would be \$2,160 for an entire day if all thirty nurses attended both sessions for one hour. For the rest of the week the session would be offered twice a day but only for thirty minutes each which would amount to \$6,480 for the rest of the week, making a total of \$8,640. This was computed by assuming that every staff member will attend every session and that they are all paid the same; therefore, actual cost may vary which is why the total cost is rounded upwards to \$10,000.

One of the main benefits associated with this project is that it will help increase patient satisfaction scores, one of the elements in HCAHPS survey. In 2016, \$1.6 billion were available for hospitals, and those with the highest HCAHPS score received more incentive payments; however, those with low scores were fined (Detwiler & Vaughn, 2020). Another benefit is that a higher satisfaction score also affects a hospital's reputation with consumers. Since these scores are public information, a low score can be detrimental to a hospital (CMS, 2021a). Although there are short-term costs associated with this project, the long-term financial benefits far outweigh the costs.

Discussion of Results

Due to COVID-19, this project was not implemented due to having an increase in agency nurses, a frequent change in managers, and a surge in patient admissions; therefore, a benchmark was appropriate for this situation. However, this project has received overwhelming support from staff and a few managers from the beginning. Ever since the project was proposed, bedside staff have been very vocal about needing something like this to relax. Some managers have also been

excited because it has become very difficult for them to motivate their staff to give their best effort due to the pandemic. They have tried all other approaches, such as bonuses, and are excited to try something new.

However, there is still one barrier that this project faces which is stigma. Naps have a stigma attached to it, and thus, anyone who takes one is seen as lazy and not serious about their job. Harboring this type of thinking, especially by management, makes it very hard for staff to relax. Another bias is that if everyone is napping, no one will care for the patients. It is very important to address both concerns to the stakeholders and staff first because if they continue to hold on to the biases, the chances of success for this project are very minimal. Melnyk and Fineout-Overholt (2019) stated that there is only a fifty percent success change rate among leaders and only a nineteen percent among the culture. Therefore, it is imperative that this is discussed in the beginning to ensure a successful implementation. The EBP team would know the project was a success when staff members nap and consequently the errors made by staff members decrease and patient's satisfaction scores increase.

Conclusions/Recommendations

Patient's safety is every hospital's priority concern, but it is difficult to promote safe and efficient care when staff are stressed out, exhausted, and sleep deprived which inadvertently causes an increase in errors. These errors could have detrimental effects on patients' health and effect staff members' professional license. This in turn becomes a liability for the hospital and effects their finances and reimbursement (CMS, 2021a, 2021b). To prevent this, recommendation includes to institute naps as a low-cost option which helps alleviate the side effects of long hours as well as increase positive patient outcomes. Further recommendation would be to implement this project on a unit or a floor first and later execute it in the entire

hospital. By first implementing on one unit, the EBP team could work out any unforeseen barriers, and thus ensuring a smoother successful implementation throughout the rest of the hospital. The consequences of short staffing and high complicated patient load are faced by all hospitals throughout the country; therefore, by normalizing and instituting naps, administrators can be assured to deliver safe, efficient, and financially responsible care.

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Appendix A

Synthesis Table

Studies	Design	Sample	Intervention	Outcome
1	Quasi-experimental	N = 38 nurses	Nap	SLP, F, physical and psychological work demand, work pace decreased QOC improved RTD dramatically decreased
2	RCT	N = 49 nurses	Nap	SLP, F decreased Performance lapse decreased (QOC increased) Vigor and IVI improved PMR decreased temporarily
3	Quasi-experimental	N = 147 nurses	FCMPN (includes nap, breaks, physical activity, and coffee)	SLD, SLQ improved DD/MVC and PE decreased SLP worsened slightly

4	Descriptive	N = 20 nurses	Nap	<p>Napping is important because it provides rest, increases alertness, and reduces error and F</p> <p>Napping schedule allows for n to look out for one another</p> <p>Half had a comfortable environment and half did not</p>
5	RCT	N = 15 nurses	Nap	<p>F and stress decreased</p> <p>Increased alertness and activity</p> <p>SLP remained slightly lower in no nap</p>
6	Quasi-experimental	N = 5 units with at least 30 nurses in each	Napping Facility/Nap LTG	<p>Napping facility did not have a significant impact on F and PWB</p> <p>Nap and LTG decreased F and improved PWB</p>
7	Systematic Review	N = 13	Nap	<p>Naps at 0000-0100: faster reaction time, decreased SLP and lapse, and improve DD</p> <p>At 0200-0300: improved SLP, F, PMR, lapses, and reaction time</p> <p>At 0400 – improved SLP, DD, lapses, reaction time. Increase in sleep inertia temporarily.</p>
8	Systematic Review - (NEX)	N = 13	Shift length (12 hour or more) and Error	<p>10 studies reported an increase in shift length results in increased in error, care left undone, and CLABSI</p> <p>3 reported no significant change in errors.</p>

9	Qualitative design	N = 28	Long shift hours and nurses' perception of it	<p>Nurses complained of exhaustion, fatigue, and hunger</p> <p>Depersonalization with patients</p> <p>Unsafe care and increase in error due to not being alert</p> <p>Balancing between work and family is hard</p> <p>Good Paycheck</p>
10	Systematic Review-(NEX)	N = 19	<p>Shift work,</p> <p>Work organization,</p> <p>Sleep quality, quantity, and fatigue</p>	<p>Quality of sleep is much lower for night/rotating shifts with an increase in medication errors</p> <p>External components of workload lead to medication error.</p> <p>Night shift nurses' experiences higher fatigue</p>
11	Descriptive Study	N = 1524	EWH (more than 40 hours)	<p>EWH > 16 hour/week have a higher rate of patient identification error and patient complaints than nurses working extend work hour 8 hour/week</p> <p>EWH > 24 hour causes a significant increase in pressure ulcer.</p> <p>There is also an increase in depersonalization, fatigue, communication errors, and emotional exhaustion, with a decrease in intent to stay and job satisfaction.</p>
12	Cross Sectional Study	N = 3037	<p>Nurse Staffing Level</p> <p>Nurse Overtime</p>	Increase of one patient/nurse, increased the unit's patient safety rating as failing or poor and quality of

				care as fair or poor by 2%, and 3% increase in care left undone EWH increased patient safety rating as failing or poor by 88%, quality of care as fair or poor by 45% and care left undone by 86%
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Legend: 1– Han, 2021, 2 – Smith-Coggins 2006, 3 – Scott 2010, 4 – Maria de Arójo 2010, 5 – Oriyama 2014, 6 – Van Woerkom 2020, 7 – Ruggiero 2014, 8 – Clendon 2015, 9 – Lobo 2017, 10 – Muzio 2019, 11 - Kunaviktikul 2015, 12 – Cho 2016, CLABSI – Central line associated bloodstream infection, DD – Drowsy Driving, EWH – Extended Work Hour, MVC – Motor Vehicle Crash, F – Fatigue, IVI – IV insertion, LTG – Light therapy glasses, NEX – Non-experimental, PE – Patient error, PMR – Probe memory recall, PWB – Psychological wellbeing, RTD – Real time drowsiness, SLP – Sleepiness at work, SLD- Sleep duration, SLQ – Sleep quality

Outcomes Table: Effect of Nap

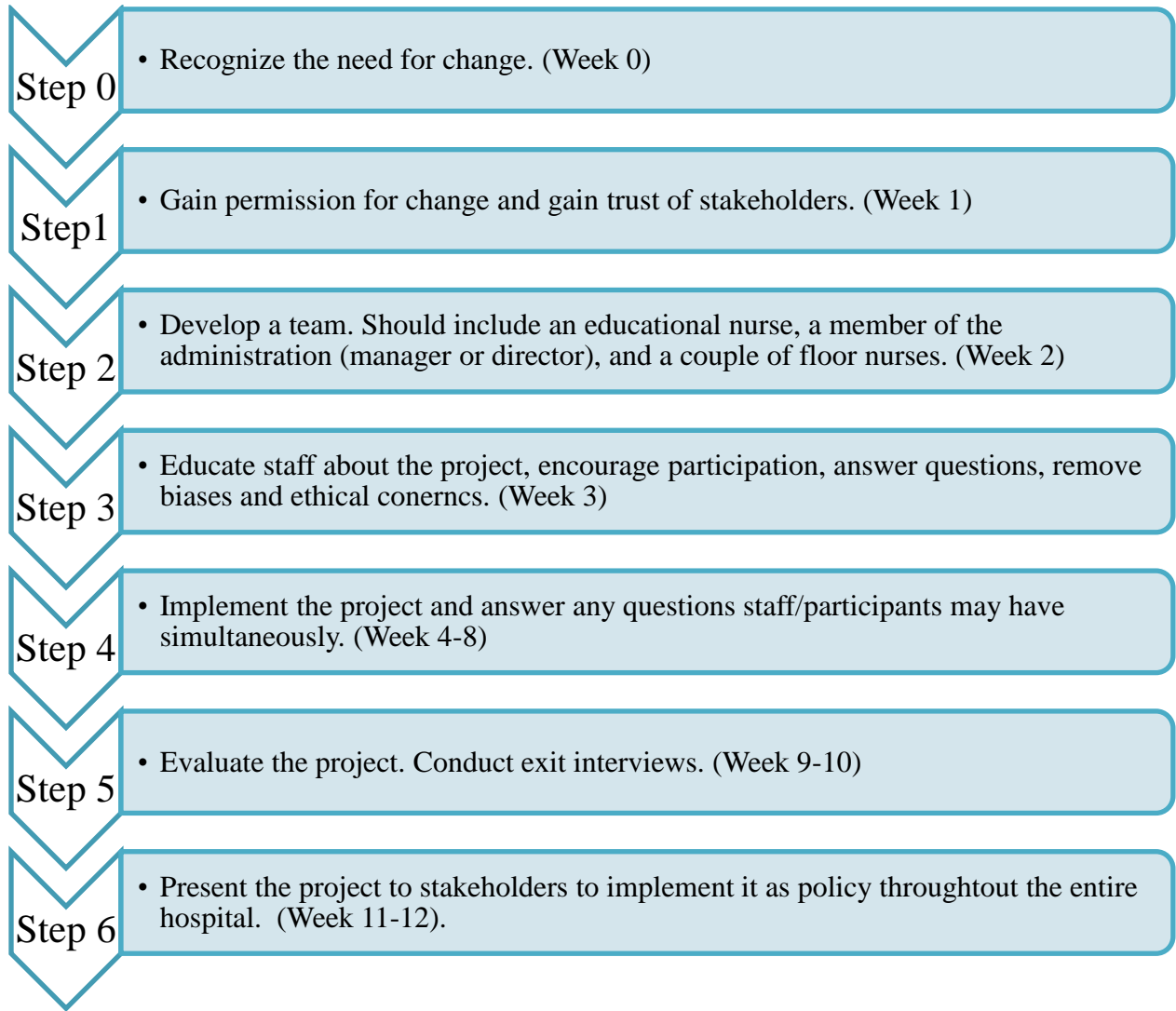
	1	2 ♦	3	4	5 ♦	6	7 ♦	8 ♦	9	10 ♦	11	12
Error/Near miss error (Patient safety)	NE	NE	↓*	↓	NE	NE	NE	↑	↑	↑	↑*	↑*
Fatigue	↓*	↓*	NE	↓	↓	↓*	↓	NE	↑	↑	↑	NE
Sleepiness at work	↓	↓*	↑	NE	↓	NE	↓	NE	NE	↑	NE	NE
Quality of care	↑*	↑*	NE	NE	NE	NE	NE	↓	↓	NE	↓*	↓*

Legend: 1– Han, 2021, 2 – Smith-Coggins 2006, 3 – Scott 2010, 4 – Maria de Arújo 2010, 5 – Oriyama 2014, 6 – Van Woerkom 2020, 7 – Ruggiero 2014, 8 – Clendon 2015, 9 – Lobo 2017, 10 – Muzio 2019, 11 - Kunaviktikul 2015, 12 – Cho 2016, NE – Not Evaluated

* = statistically significant findings

◆ = higher level evidence

Appendix B



Appendix C

Excel Spreadsheet Example

Date	Name	Nap Y/N	Error Y/N	ERS Filed Y/N	Near-miss Error Y/N	Total of day Errors only	Total of day Near miss only
						Add all the errors from all of the participants	
						For the end of the day	
						For a total error/near miss error of the day	

Day	Total Errors only	Total Near miss only	Avg of Week 1 Error only	Avg of Week 1 Near miss only
1			Final total/7	Final total/7
2				
3				
4				
5				
6				
7				
Final Total				

Day	Total Errors only	Total Near miss only	Avg of Week 4 Error only	Avg of Week 4 Near miss only
1			Final total/7	Final total/7
2				
3				
4				
5				
6				
7				
Final Total				

Appendix D

Napping Survey

Name:

Date:

Department:

Start of Shift Survey:

Is this your first shift this week?

What number of shift/per week is this shift?

How many total hours have you worked this week?

Did you rest during before this shift?

How would you rate these at the start of the shift? On a scale of 1-10, 1 being the worst and 10 being the best health.

Tiredness:

Sleepiness:

Overall Fatigue:

Post-Nap Survey:

Did you nap?

Did you have any stimulants before the nap such as coffee or energy drink? Specify.

Did you find the environment comfortable and inviting to nap?

Did you experience any sleep lag post nap?

How long was the sleep lag?

How would you rate these immediately post nap? On a scale of 1-10, 1 being the worst and 10 being the best health.

Tiredness:

Sleepiness:

Overall Fatigue:

End of Shift Survey

How would you rate these towards the end of the shift? On a scale of 1-10, 1 being the worst and 10 being the best health.

Tiredness:

Sleepiness:

Overall Fatigue:

Did you make any errors?

Did you file an ERS?

Were details provided in the ERS. If not, please write them on the back of the survey.

Were there any near-miss errors that you caught?

Specify?

Do you feel more or less alert towards the end of the shift? Specify?

Has your work performance improved or declined? Specify

What was the total number of hours you worked today?