IMPROVING SLEEP OPPORTUNITIES IN HOSPITALIZED POSTPARTUM MOTHERS

by

Lindsay Rose Cantwell

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ABSTRACT

Sleep deprivation and the fatigue experienced by new mothers remain well-accepted facts of life after the birth of a newborn. In the past, most new mothers utilized hospital nurseries to aid them in caring for their infants after birth; but recent paradigm practice changes in hospitals emphasize rooming-in, breastfeeding, and strongly discourage separation of the mother/newborn couplet. In Baby-Friendly accredited hospitals, postpartum mothers are encouraged to prioritize their infant's needs often above their own, contributing to significant maternal sleep deprivation and fatigue. This quality-improvement project aimed to increase sleep/rest opportunities for mothers through the implementation of coordinated quiet times on a postpartum unit in a Baby-Friendly hospital in the northwestern area of the United States. The Knowledge to Action framework guided this project. Staff received education about the importance of postpartum sleep and the quiet-time practice change. The implementation took place over 4 weeks. Chart reviews were completed, and the mothers who received quiet times were tracked. Practice outcomes included 51% of postpartum moms having a quiet time during week 1; week 2, 64%; week 3, 57%; and week 4, 62%. The quality-improvement project successfully increased sleep/rest opportunities for mothers through quiet times. Prior to the project, there was no standardized effort on the unit to promote maternal sleep or rest. An increase of over 50% during all practice weeks was accomplished. Additionally, there was no significant increase in infants utilizing the nursery, making this intervention viable in the Baby-Friendly hospital setting.

PRACTICE PROBLEM INTRODUCTION

Sleep deprivation and the fatigue experienced by new parents remain a well-accepted fact of life after the birth of a newborn. In the past, most new mothers utilized hospital nurseries to aid them in caring for their infants after birth; but recent paradigm practice changes in hospitals emphasize rooming-in, breastfeeding, and strongly discourage separation of the mother/newborn couplet. In Baby-Friendly accredited hospitals, postpartum mothers are encouraged to prioritize their infant's needs often above their own, contributing to significant maternal sleep deprivation and fatigue (Lai et al., 2015). If not remedied, maternal exhaustion can contribute to many adverse outcomes, including impaired bonding and an increased risk of postpartum depression (Lawson et al., 2015). The Baby-Friendly Hospital Initiative creates many benefits for breastfeeding and mom/infant bonding, but maternal recovery needs are often not addressed. Ideally, this care model should incorporate intentional nursing strategies to promote rest and recovery for new moms following delivery while maintaining baby-friendly care.

Background and Significance

Postpartum women remain at risk for significant fatigue and decreased sleep following delivery due to multiple factors, including the hospital environment, medical interventions, noise, pain, anxiety, medication effects, breastfeeding, crying infants, and the need to provide nocturnal infant caregiving (Auckley, 2021; Doering & Dogan, 2018). Poor sleep contributes to exhaustion, decreased concentration, impatience, resentment, and reduced quality of life (Lewis et al., 2018). Maternal fatigue and tiredness result from rest and activity imbalance (Kurth et al., 2010). Milligan et al. (1996) define tiredness as a physiological state caused by extended periods

of wakefulness and exertion relieved by sleep, while fatigue is a pathological state that is not relieved through a single sleep period (Kurth et al., 2010). Nearly 64% of new mothers report experiencing significant fatigue after birth in the postpartum period (Badr & Zauszniewski, 2017). A longitudinal study assessing sleep in hospitalized patients by Wesselius et al. (2018) found that, on average, patients slept 83 minutes less compared to habitual sleep at home, had 1.3 more nighttime awakenings, and woke up 44 minutes earlier than usual wake-up time at home. Research links sleep deprivation in the hospital to significant adverse health problems, including alterations in glucose metabolism, cellular immunity, cortisol regulation, and circadian rhythms, as well as increased risk of long-term sleep disorders that contribute to depression, anxiety, and posttraumatic stress disorder (Growdon & Inouye, 2018). Consequences of sleep disruption in postpartum mothers include emotional exhaustion, interference with breastfeeding establishment, disruption in immune and cardiovascular function, and other adverse physical and psychological outcomes that impede recovery and rest (Adatia et al., 2014). Additionally, sleep deprivation may contribute to the nearly three-fold increase in cortisol levels found in postpartum women (Adatia et al., 2014).

Research indicates that postpartum moms sleep 7 hours each night, but nighttime infant-caregiving activities impair sleep efficiency (Doering & Dogan, 2019). Sleep efficiency is defined as the percentage of time spent asleep compared to the amount spent in bed, and is lowest right after birth, but improves over time for postpartum women (Doering & Dogan, 2018). A study by Theo and Drake (2017) studying the rooming-in experience in hospitalized postpartum moms found that 4.4 hours of sleep was the average amount of sleep reported, ranging from 1.5 to 8 hours. Additionally, in this sample, 24% of moms rated their sleep quality

as fairly bad, 12% as very bad, and 64% as good or fairly good (Theo & Drake, 2017). Hospitalized postpartum women deal with the barriers to sleep due to the hospital environment and required medical care, all while caring for a newborn, compounding the problem of sleep deprivation. A descriptive cross-sectional study by Lai et al. (2015) compared postpartum fatigue scores and the delivery method, with findings suggesting cesarean birth is associated with higher fatigue scores in new mothers compared to vaginal births. Additionally, Lai et al. (2015) found a correlation between higher fatigue scores and increased difficulty in baby-care activities resulting in weaker infant-mother attachment measurements.

The relationship between maternal sleep deprivation/fatigue and the development of postpartum mental disorders, especially postpartum depression, remains challenging to articulate due to a multitude of confounding factors. However, recently more research has been dedicated to understanding the relationship. Sleep disturbances are classic symptoms of depression and anxiety disorders and are strongly associated with psychosis, according to the Diagnostic and Statistical Manuel of Mental Disorders (DSM-V) (Lawson et al., 2015). Postpartum depression (PPD) is common, with 13% to 19% of mothers suffering from PPD (Lewis et al., 2018). Stated another way, out of the four million births each year in the United States, about 800,000 mothers will suffer from major or minor depression in the first 3 months postpartum (Werner et al., 2016). Negative consequences associated with PPD include difficulty caring for the newborn, poor maternal/child bonding, long-term child behavior problems, increased maternal weight retention, and increased future depression risk for both parents (Lewis et al., 2018). Postpartum mental illnesses remain one of the leading causes of morbidity and maternal death in the perinatal period and, in severe cases, contribute to infant abuse, neglect, and infanticide (Lawson

et al., 2015). While all women are at risk for PPD following delivery, increased vulnerability is associated with low socioeconomic status, marital conflict, stressful life events, and poor social support systems (Lawson et al., 2015). A systematic review by Lawson et al. (2015) examined 31 studies regarding the relationship between sleep and postpartum mental disorders and found moderate evidence supporting a relationship between self-reported poor sleep and the development of postpartum depression.

Born out of the initiative to empower mothers to breastfeed their infants successfully and limit formula companies from direct marketing and interference, the Baby-Friendly Hospital Initiative (BFHI) was developed and launched by The World Health Organization (WHO) and The United Nations Children's Fund (UNICEF) in 1991 (Baby-Friendly USA, 2021). Baby-Friendly accreditation is a rigorous process involving years of robust lactation work and practice changes for a hospital to gain Baby-Friendly designation. The ten steps of the BFHI include compliance with the International Code of Marketing of Breast Milk Substitutes, having a written infant feeding policy, having an ongoing monitoring/data management system, staff training in breastfeeding support, discussing the importance of breastfeeding with pregnant women, immediate and uninterrupted skin to skin contact and breastfeeding as soon as possible after birth, breastfeeding initiation and support, not providing breastfed infants with any foods or fluids other than breastmilk unless medically indicated, having infant and mothers together in their room 24 hours a day, teaching mothers about infant feeding cue recognition, educating mothers about the risks of bottles/pacifiers/artificial nipples, and coordinating discharge with ongoing breastfeeding support and resources (Baby-Friendly USA, 2021). The BFHI has numerous benefits for mothers and infants including increasing the chance of successful

breastfeeding, bonding, and promotion of parent-led newborn care rather than medical-led newborn care, but maternal sleep needs are often forgotten.

After multiple years of hard work, one hospital in the northwestern United States transitioned to the Baby-Friendly care model and received accreditation in 2019. After receiving BFHI accreditation, this hospital has successfully increased exclusive breastfeeding rates; however, nurses and administrators recognize the increased barriers to sleep and recovery new moms face when being expected to care for their infants 24 hours a day right after delivery. The nursery remains available to care for infants between breastfeeding sessions when safety concerns exist due to parental fatigue or maternal medical instability. The unit goal is to maintain rooming-in for the entire hospital stay for at least 80% of all infants born at this hospital unless medical indications dictate separation. Parents receive education about the importance of rooming-in to facilitate breastfeeding and avoid missed feeding cues. In personal conversations with new moms regarding their postpartum hospital experiences, many verbalize feelings of exhaustion, sleep deprivation, and fear/shame for desiring their nurses to take their infants to the nursery. Due to the notable decreased emphasis on nursery services, many mothers feel guilty if they request their infant be cared for in the nursery and some have mentioned they feel like bad moms for desiring sleep over time with their babies. Numerous patients request early discharge home at 24 hours post-delivery, and some have verbalized reasons including poor sleep in the hospital setting due to multiple interruptions and limited nursery support. By not making sleep a priority for new mothers and failing to educate new parents about strategies to promote sleep at home, BFHI hospitals may inadvertently contribute to long-term adverse health effects. Research demonstrates that poor maternal subjective sleep and postpartum fatigue contribute to

depression, poor functional status, early weaning from breastfeeding, and impaired infant development (Doering & Dogan, 2018).

New mothers require adequate sleep and rest in the hospital setting to parent effectively, prevent adverse health outcomes, and have a positive recovery experience. Ideally, strategies for improved sleep in the hospital will translate into improved sleep for the whole family once home. Sleep promotion to prevent depression symptoms and other adverse health effects remains critical for mothers and fathers. Research by Saxbe et al. (2016) suggests that maternal sleep problems may contribute to the transmission of depression within the couple from mothers to fathers. Postpartum depression risk increases with maternal fatigue and poor sleep quality (Park et al., 2013). A solution for this significant problem is multifaceted. However, the best evidence available indicates that implementation of a quiet time free from hospital staff interruptions has a positive effect on maternal rest, infant bonding, breastfeeding rates, and perception of the restfulness of the hospital environment (Lawrie et al., 2021; Church, 2020; Grassley et al., 2018). The hospital has a set quiet time from 2 p.m. to 4 p.m. already in place; however, on the postpartum unit, this intervention is not currently emphasized or utilized effectively due to the nature of deliveries and infant feedings occurring at variable hours. Currently, there are no coordinated and specific quiet times consistently arranged by nurses. This creates a large gap in practice as many mothers may not receive any uninterrupted quiet-time periods which can increase the risk of sleep deprivation and development of adverse health conditions.

The purpose of this quality-improvement project was to increase rest/sleep periods for hospitalized postpartum mothers through implementation of a quiet time. A potential long-term goal includes decreasing the risk of postpartum depression and other adverse health outcomes.

Successful implementation of a quiet time will require parent and staff education, coordination of needed medical care, and individualization for optimal results. Ideally, the quiet time will occur right after an infant feeding and Baby-Friendly practices, such as rooming-in, will continue to be maintained. In order to practice rooming-in, emphasis will be on parent education regarding infant-care strategies and empowering available support persons to help care for the infant to facilitate maternal sleep.

SYNTHESIS OF THE LITERATURE

The literature review focuses on research investigating the significance of maternal postpartum sleep disruption that contributes to fatigue and the relationship to adverse health outcomes. Additionally, articles were examined that focused on interventions aimed at decreasing sleep disruptions in the hospital and postpartum period. Databases utilized to find applicable research articles included Web of Science, CINAHL, Joanna Briggs Institute EBP Database, Cochrane Database, and Google Scholar. Search terms included: postpartum sleep, postpartum depression, postpartum fatigue, Baby-Friendly Hospital Initiative, rooming-in, postpartum sleep disturbance, and hospital sleep disruption.

Adverse Outcomes Related to Sleep Disruption and Fatigue

A theme emerging from the literature is that a definite relationship between sleep disruption and postpartum depression exists (Lawson et al., 2015; Lewis et al., 2018; Bhati et al., 2015; Okun et al., 2018). This relationship remains challenging to understand fully, as postpartum depression risk increases with sleep disruption; but in contrast, disrupted sleep can be a consequence of depression (Lewis et al., 2018; Saxbe et al., 2016). Postpartum sleep disruption and poor sleep quality remain essential modifiable risk factors for developing maternal mental-health conditions. Iranpour et al. (2016) completed a cross-sectional study that found postpartum women with poor sleep quality had a 3.34 times higher risk of developing depression. A longitudinal study by Okun et al. (2018) found that women with poor sleep-quality scores at 6 months postpartum also scored significantly higher on depression and anxiety scales even after adjusting for covariates.

While most studies have examined sleep through subjective study designs, Park et al. (2013) measured sleep by utilizing wrist actigraphs and subjective sleep surveys in postpartum women. They then compared these measurements with Edinburgh Postnatal Depression Scale (EPDS) scores across multiple postpartum weeks. A significant correlation between poor actigraphic measures of sleep and higher EPDS scores were found (Park et al., 2013). These studies highlight the vital role sleep plays in the risk for postpartum depression development and the need for interventions aimed at mitigating sleep disruption in postpartum women.

Sleep Experiences among Hospitalized Postpartum Women

Another clear theme emerging from the literature review is that postpartum mothers remain incredibly vulnerable to sleep disruption and fatigue due to hospital factors, infant-care needs, and delivery factors (Ling et al., 2015; Kurth et al., 2010). Since the BFHI began, few studies have investigated the potential unintended consequences of this intervention on moms or babies, and no modifications to the program have occurred since 1996 (Steinhorn, 2020). Practicing rooming-in remains one of the crucial pillars of Baby-Friendly care, but little research exists regarding the effects on postpartum fatigue, patient satisfaction, and infant safety. One available study by Theo and Drake (2017) indicates that 60% of surveyed postpartum mothers were satisfied with their rooming-in experience; however, the study sample was small, highlighting the need for more research.

Due to infant-caregiving needs, postpartum mothers experience significant fatigue and sleep deprivation, which peaks in the first few weeks after birth and then slowly improves (Kurth et al., 2010; Lai et al., 2015, Khayamim et al., 2016). Sleep problems can occur up to 12 months

after delivery, but usually improve between 6 weeks and 7 months postpartum (Lewis et al., 2018). A meta-analysis by Badr and Zauszniewski (2017) investigated predictive factors for postpartum fatigue. Factors demonstrating a medium effect size included sleeping problems, stress, anxiety, breastfeeding problems, low ferritin levels, low hemoglobin levels, and physiological illness (Badr & Zauszniewski, 2017). In this study, the only factor with a large effect size was depression (Badr & Zauszniewski, 2017). Hospitalization also increases the risk of sleep disruption, as Wesselius et al. (2018) demonstrated in a large cross-sectional study that included 2,005 patients. In this study, all sleep-related measures, such as total time asleep, waking up earlier, and nocturnal awakenings, were worse in the hospital than the sleep patients typically experienced at home (Wesselius et al., 2018).

Interventions

Robust literature investigating interventions for sleep promotion in hospitalized postpartum women remains limited, with few randomized controlled trials. However, promising pre/post-intervention research exists regarding specific interventions for sleep promotion for postpartum women. Additionally, research regarding sleep promotion interventions for general hospitalized patients is prevalent. Interventions for hospitalized patients backed by research can be modified and utilized in the postpartum setting. The prevalence of maternal fatigue after childbirth and associated negative consequences is receiving more attention and dedicated research, further enhancing knowledge regarding best practices for both moms and newborns.

A meta-analysis of non-pharmacologic interventions for improving postpartum sleep by Owais et al. (2018) found evidence that supports massage, exercise, and other non-

pharmacologic interventions, with massage and exercise having the most substantial effect. Implementing massage in the hospital setting, while beneficial, would also require a significant financial investment by the hospital with no reimbursement for that service besides potentially improved patient satisfaction scores. The multiple benefits of exercise in the postpartum period, including sleep benefits, could be included in parent education about sleep promotion strategies. However, implementation in the hospital setting is not feasible and may hinder maternal recovery after delivery. Additionally, a review of the literature by Mathew et al. (2018) highlights other significant non-pharmacologic factors that help reduce postpartum fatigue, including social support from family/friends, nursing support, education on self-care strategies, warm showers, exercise, aromatherapy, and lavender/chamomile tea. Improving nursing and family support in the hospital setting remains a feasible option to improve maternal sleep. Additionally warm showers and lavender or chamomile tea are easy and accessible interventions that may provide benefit in the hospital setting.

While sleep is critical for healing and recovery, sleep assessment and promotion in the hospital setting remain understudied. Research on sleep in the intensive care unit by Eliassen and Hopstock (2011) identified four nursing-driven strategies to promote sleep, including noise reduction, light reduction, improving patient comfort, and clustering medical care to allow sleep periods free from interruptions. This study highlighted that the ICU nurses recognized the importance of patient sleep but did not utilize a formalized approach to sleep promotion. Of note, 72% of the nurses in this study reported that they regularly clustered care and facilitated uninterrupted patient sleep during the daytime (Eliassen & Hopstock, 2011).

Patient-driven sleep interventions studied in the research remain sparse. A recent pilot study by Mason et al. (2021) assessed a patient-centered program called I-SLEEP. The I-SLEEP program aims to educate and empower patients about hospital sleep promotion through a video, brochure, and sleep kit, which includes an eye mask and earplugs. The patients are encouraged to ask questions regarding the necessity of overnight vitals, early morning blood draws, and required routine nighttime medical care (Mason et al., 2021). Results indicate that 95% of patients felt empowered to advocate for more sleep, and 63% of patients utilized one of the interventions in the program to increase sleep opportunities (Mason et al., 2021). Despite the positive results, this program's actual effect on the quality and quantity of patient sleep in the hospital remains unknown as Mason et al. (2021) did not assess these measures. However, overnight lab-draw occurrences decreased and patients who asked the I-SLEEP questions had a significant decrease in nighttime vital-sign interruption (Mason et al., 2021).

One of the most promising interventions for postpartum sleep disruption emerging from the literature is the concept of quiet time during hospitalization. Grassley et al. (2018) completed a pre/post-intervention study evaluating the implementation of a quiet time or “designated family bonding time” to decrease interruptions and increase exclusive breastfeeding rates. Findings from this study indicate that a quiet time between 2 p.m. and 4 p.m. each day had significantly positive effects on increasing breastfeeding rates and decreased interruptions by hospital staff. While this study did not precisely measure maternal sleep quality or quantity, Grassley et al. (2018) did ask mothers about interruptions interfering with their ability to rest and found a notable improvement between study phases. Laura Church (2020) details strategies to implement a successful quiet time on postpartum units, highlighting the importance of individualizing the

plan of care with patients, setting realistic expectations, and balancing medical care needs with uninterrupted bonding time. Benefits of quiet time include increased patient satisfaction scores, improved maternal perception of interruptions, and, most importantly, increased bonding and rest opportunities (Church, 2020). Another pre/post quiet-time intervention study by Lawrie et al. (2021) found similar results to Grassley et al. (2018). Quiet-time implementation between 1 p.m. and 3 p.m. resulted in a drop from an average of 74 interruptions to 37 per day (Lawrie et al., 2021). This led to dramatic improvements in patient ratings of quietness and an increase in exclusive breastfeeding rates from 34% to 48% (Lawrie et al., 2021).

McKinney (2013) discussed strategies for success when implementing quiet time on a postpartum unit that prioritize a team and culture shift. Including all members of the care team in the mission and goal of the project is critical for significant impact. To effectively implement these goals and improve outcomes, all providers need to be educated, including nurses, CNAs, environmental services, dietary, finance, care managers, lactation specialists, and doctors (McKinney, 2013).

In recent years, multiple studies have investigated interventions that promote effective parenting and sleep for mothers once they are home in the postpartum period. One of these programs implemented after discharge from the hospitals is Helping U Get Sleep (HUGS). HUGS is based on education about getting more sleep and self-management techniques to assist postpartum women in setting goals, acting, and evaluating their sleep quality in the first weeks following delivery (Doering & Dogan, 2018). The HUGS intervention was implemented in a pilot study by Doering and Dogan in 2018, with notable improvement in both fatigue and sleep disturbance scores in the intervention group compared to the control group. The Individual and

Family Self-Management (IFSMT) theory guided the development of the HUGS program, which supports the new mother and the entire family in the process of facilitating sleep and coordinating baby-care activities (Doering & Dogan, 2018). A promising observation from this study included multiple instances of family member support and participation increasing sleep for new moms, which may be valuable in rooming-in situations in the hospital setting. While promising, the HUGS program requires a robust home healthcare team to implement, as it was designed for the outpatient setting. However, the education portion could be modified and utilized in the hospital setting.

Theo and Drake (2017) recognized the importance of rooming-in for mother/infant bonding, but also advocated for interventions that support maternal rest and recovery. The interventions include nursing strategies to cluster mom/infant care, limit unnecessary hospital interruptions, assess maternal sleep each shift, promote sleep hygiene, treat pain, and assist with nighttime infant caregiving (Theo & Drake, 2017). One of the most stressful tasks a mother will undertake after birth is breastfeeding, which can be challenging depending on mother and infant factors. Educating mothers about the importance of calling for assistance with breastfeeding as needed remains critical to preventing maternal frustration and fatigue. If feedings are unsuccessful during nighttime hours, maternal sleep will be significantly interrupted, compounding fatigue and impairing recovery (Theo & Drake, 2017). Nurses play a critical role in supporting each mother/infant dyad by facilitating rest, successful breastfeeding, and recovery.

Limitations

The difficulty lies in balancing the needs of new moms and newborns. Many benefits exist in the rooming-in experience, including opportunities for bonding and breastfeeding. Research suggests that many moms feel comforted knowing their infants remained by their side throughout hospitalization despite potential negative sleep impacts (Theo & Drake, 2017). Supportive interventions to promote maternal rest and sleep must incorporate BFHI strategies to limit the negative impact on hospital accreditation status. Limited research in the last 5–10 years is available that truly investigates maternal postpartum sleep quality or quantity in Baby-Friendly hospitals or interventions to promote sleep in this vulnerable population. Recent pre/post-intervention studies demonstrate that nursing strategies, such as unit-wide quiet times, appear to positively affect patients' perceptions of a quiet and restful environment. Notable limitations exist with the current research as no randomized controlled trials exist studying quiet time in postpartum environments. The available research does not precisely measure the effect a standardized quiet time may have on maternal sleep or rest. Despite these limitations, the evidence supports the implementation of uninterrupted rest periods to improve mothers' perceptions of a quiet and restful hospital environment. Sleep quality remains a subjective perception. Focusing on individualized quiet times with no unnecessary interruptions will improve mothers' perceptions of their sleep in the hospital setting. Additionally, the strong relationship between sleep deprivation and postpartum depression indicates that interventions that improve maternal sleep may assist in decreasing PPD risk. A set quiet time for every couplet on the floor remains challenging to achieve as each couplet has different medical needs, feeding

schedules, and delivery times. However, a nurse-coordinated and individualized quiet time increases the likelihood of uninterrupted rest periods for mothers.

Barriers to sleep and positive rooming-in experiences identified by Theo and Drake (2017) include frequent hospital interruptions, perceived inattentiveness of nurses, and inadequate pain relief. Quiet time will help mitigate perceived interruptions, but it may increase the perception of nurse inattentiveness if the plan is not communicated effectively by nurses and individualized to each couplets' needs. Nurses must also assess maternal pain and discomfort and provide interventions to increase the chance of rest and restorative sleep during quiet time. In the practice setting, strategies to increase success will include placing specific signs indicating quiet time on the doors with the specified time period, dimming hallway lights, decreasing noise sources, limiting unit traffic by support staff, limiting housekeeping activity during quiet time, education of parents, and coordination of care by nurses as appropriate to enhance quiet time.

Discussion

The available studies demonstrate the need for rigorous research studies such as randomized controlled trials to increase the knowledge base regarding the best postpartum care for both moms and infants as well as methods to combat fatigue and sleep deprivation. Few randomized controlled trials regarding this subject matter exist, creating a significant gap in the literature. There is a definite need for expanded research regarding the multifaceted factors involved in postpartum fatigue and interventions to improve sleep quality and quantity for new moms. However, the available research supports a quality-improvement project aimed at increasing sleep for hospitalized mothers by the implementation of a quiet-time intervention.

Providing patient-centered care remains essential to enhance patient recovery and promote health. Hospital staff must balance and recognize patient needs for rest and recovery while also providing safe medical care. In the hospital in which this project was implemented, often needs of the medical caregivers, such as completing assessments and charting, supersede patient needs. In many observations at this practice site, regardless of whether a patient is eating a hot meal, sleeping, or breastfeeding, nurses and doctors will often complete physical assessments on the mom or infant rather than working around the patient's schedule or waiting for the patient to complete an activity. Implementing daily scheduled quiet times for each couplet is an ideal way to facilitate patient-centered care instead of provider-centered care in this hospital setting.

With Baby-Friendly accreditation, the hospital shifted to infant-centered care, but, in the process, mothers' needs for sleep and rest were minimized. The proposed intervention for this QI project will be to implement a nurse-driven and individualized quiet time for each couplet based around each couplet's specific schedule. A quiet-time intervention will ideally enhance care for both mothers and infants by encouraging restorative sleep, increasing bonding, and promoting recovery. Additional strengths of this proposed intervention include increasing mother-baby bonding, which is one of the primary goals of the Baby-Friendly Hospital Initiative. The intervention may also decrease maternal risk of sleep-related adverse health consequences including postpartum depression as indicated in the literature.

SETTING AND METHODS

This quality-improvement project occurred in a Baby-Friendly hospital in the northwestern United States. The process change focused on implementing an individualized quiet time every 24 hours coordinated between nurses and each mother/infant couplet to increase rest opportunities free from interruptions in the hospital setting. Coordinated quiet times allowed hospitalized mothers to rest and provided opportunities for sleep. This project focused on nursing interventions that increased the likelihood of sleep for new moms. The interventions included teaching patients about the importance of sleep, care coordination, support-person empowerment, quiet-time sign usage, and infant-care strategies that remain baby-friendly.

Framework

Knowledge to Action

The Knowledge to Action (KTA) framework consists of two primary components: knowledge creation and action (Graham et al., 2006). The KTA was conceptualized by Graham et al. in 2006. In response to the lack of consistent implementation definitions and confusion regarding effective implementation frameworks, Graham and his colleagues evaluated over 30 planned action change theories and synthesized prominent components into the KTA framework (Field et al., 2014). The KTA remains a robust framework that delineates the steps of successful implementation. The KTA phases include:

1. Identifying the problem
2. Reviewing the available knowledge
3. Selecting the applicable knowledge

4. Adapting the new knowledge to the specific site for the project
5. Assessing barriers to knowledge use
6. Selecting and tailoring interventions
7. Monitoring the knowledge use
8. Evaluating outcomes
9. Sustaining the new knowledge use

(Graham et al., 2006).

The KTA framework provided an exceptional framework map that increased the likelihood of implementing uninterrupted quiet times for postpartum moms in a Baby-Friendly hospital. The KTA steps aligned synergistically with the goals of this quality-improvement project.

Agency Description

Setting

The quality-improvement project was completed on a labor, delivery, and postpartum unit in a Magnet-designated acute care hospital in the northwestern area of the United States. The hospital site prioritized and valued nurse-driven practice changes that improve the safety and quality of patient care. The hospital had over 200 beds. Providing exceptional care, especially to poor and vulnerable populations, was a core value at the hospital practice site. The L&D unit contained 10 labor rooms, 13 postpartum rooms, and three antepartum rooms. This unit completed over 100 deliveries each month and served a large geographic area, including multiple indigenous-American reservations. After a 2-hour recovery period on labor and delivery, each

mother/newborn couplet was transferred across the unit to a new room on the postpartum side for the remainder of their stay. However, medical needs, such as magnesium administration for preeclampsia, required some patients to remain in labor and delivery throughout the stay. Obstetricians and certified nurse-midwives performed deliveries in this hospital. The unit recently achieved Baby-Friendly accreditation, which increased exclusive breastfeeding rates in the hospital setting.

Target Population

The specific population focus of this quality-improvement project included primipara and multipara postpartum mothers hospitalized in the practice site hospital. While findings suggested that mothers who undergo cesarean sections may suffer more fatigue than mothers who deliver vaginally, both were included in the sample. The process change of designated quiet times was offered to all postpartum women hospitalized during the project period. The sample consisted of all the postpartum mothers who delivered during the 4-week project period. Exclusion criteria included mothers who suffered from preeclampsia or eclampsia who remained on labor and delivery for emergent magnesium administration, as well as postpartum mothers transferred to the intensive care unit for life-threatening conditions following delivery.

Description of the Stakeholders

The labor and delivery practice change site was staffed by 60 nurses, three lactation specialists, and eight support personnel. The unit manager and two nurse educators offered robust support for this practice change proposal.

Facilitators and Barriers to Implementation

One of the most prominent barriers to implementing uninterrupted quiet times for postpartum moms included infant-care needs while rooming-in. With BFHI designation, the unit prioritized keeping the majority of mothers and infants rooming-in throughout the whole hospital stay, which limited nurses' ability to assist with infant care during rest periods.

Baby-Friendly accreditation is a 5-year process involving significant resources and work, so this quality improvement had to work within the constructs of this initiative. Once Baby-Friendly accreditation is achieved, hospitals must continue to submit data to Baby-Friendly to prove the guidelines continue to be followed successfully. In addition, site visits occur every 3 years for accreditation renewal. A project that contradicted Baby-Friendly goals would be poorly embraced by unit nurses and management.

This project stressed the importance of creating opportunities for rest for moms by utilizing support persons such as fathers to help care for the infant while mom slept in the room. Support persons were equipped and empowered to care for the newborn during maternal rest periods. Unit nurses drove the facilitation of successful quiet times for mother/infant couplets by providing education and emphasizing the importance of maternal sleep. Through robust education regarding infant-care strategies provided by nurses, successful rest times while rooming-in occurred. Nursing staff, lactation, certified nurse assistants, educators, and the unit manager recognized the significant practice problem of postpartum sleep disruption. They were willing to work to improve processes to increase the ability of postpartum moms to have more restorative sleep/rest periods.

Project Design

This project's foundation was quality improvement to transform the care mothers receive in the Baby-Friendly hospital setting. The Knowledge to Action framework was the implementation framework that directed the steps of the QI process. An extensive overview of the QI project design included identifying the gap in practice, examining the evidence, developing an intervention, implementing the intervention, measuring the intervention, evaluating the intervention, and sustaining the intervention.

SMART Goals

Short-term Outcome Goals

1. Quiet-time education, including documentation expectations, will be completed with >90% of unit staff before the implementation start date.
2. Educational sleep pamphlets regarding the importance of sleep and strategies to increase postpartum sleep will be designed, approved by the unit council, and printed by 1 week prior to the implementation start date.
3. Quiet-time reminder checklists for nurses will remain in the nursery and breakroom 100% of the time during the project period.

Intermediate Outcome Goals

1. Sleep education pamphlets will be placed in 100% of room set-up packets during the project period.
2. Quiet-time signs will be utilized, and the time period will be printed in dry erase marker for designated quiet times during 100% of team-lead rounds.

Long-term Outcomes

1. During week 1 of the project period, 75% of postpartum moms will have one documented rest time in the EHR every 24 hours. The goal will increase weekly as follows: week 2, 80%; week 3, 90%; and week 4, 95%.

2. Infants out of their room into nursery will not increase by more than 5% during all project weeks as documented in EHR.

Project Methods

Steps

The first phase of the KTA framework involved identifying a problem. While the care provided on this unit was exceptional and the dedication to improvement remained exemplary, prioritizing maternal sleep remained a significant problem. With the shift to Baby-Friendly care, mothers' sleep needs were often ignored, demonstrating a need for change. The practice change of rooming-in, while beneficial for bonding and breastfeeding, often impaired the ability of mothers to get sleep as they were required to be the primary caregivers for their newborns. The next step in the first phase of KTA involved identifying the change agents. The change agents of this QI project included a doctoral nurse practitioner student (team lead), the two unit educators, the unit manager, support staff, and the postpartum nurses. All change agents understood the goals for the QI project and the why behind the practice change. The target audience for this practice change was hospitalized, postpartum mothers.

The next phase of the KTA framework involved developing the innovation or intervention and adapting the acquired knowledge to the local context, the specific postpartum

unit. The literature review demonstrated strong evidence to support the implementation of designated quiet times with no unnecessary interruptions for postpartum moms. Each afternoon, the hospital setting already had a quiet time from 2 p.m. to 4 pm. However, it was not utilized on the postpartum unit due to drastically different schedule needs for each couplet based on infant feedings and delivery times. Instead, adaptation to the practice change setting involved nurses coordinating a 2-hour quiet time for each couplet in the first 24 hours after delivery and each day after, based on each couplet's specific schedule regarding feedings, medical care, and delivery time.

The next phase in the KTA involved the assessment of the barriers to utilizing the acquired knowledge. Known barriers to implementing coordinated quiet times included guest visiting times, infant-care needs, technology interruptions, medical care needs, and provider care needs. Education regarding the importance of optimizing postpartum sleep was provided to each couplet via a handout designed by the team lead and approved by the unit council. A strong emphasis was placed on support person assistance with newborn care while each mother slept. Parents were educated about the goals of quiet time, including limiting guests and technology interruptions such as turning cell phone notifications off and silencing ringers during sleep times. Ideally, a quiet time was planned for directly after an infant feeding and when a support person was available to assist with caring for the infant in the room. Occasionally, no support person was available, which created a barrier to maternal rest. In these cases, nurses needed to be more proactive in assisting those mothers with helping infants remain calm and sleep independently in the bassinet to enable maternal rest. In extreme cases of fatigue, it was acceptable for the nurses to offer to take an infant to the nursery to aid a mom in getting sleep. A sign was placed on the

exterior of each couplet's door depicting how long they wished not to be disturbed, and they were instructed to utilize the call light if any needs arose during their quiet time. When quiet signs were present on doors, the unit staff knew to take extra care to decrease exterior noise in the hallways and nursing station. Nurses were instructed to complete all necessary medical care before or after a planned quiet time as much as possible. Some mothers and infants had acute medical care needs that were a significant barrier to designated quiet times. Nurses tried to facilitate as much rest as possible between necessary medical care in these cases.

Providers, such as pediatricians, certified nurse midwives, and obstetricians, round at various times throughout the day. After arrival, providers plan to see all their patients as it works within the provider's specific schedule. If the coordinated quiet time was scheduled to occur and then a provider arrived to round, they were likely to disregard the sign and enter the room during the quiet time. A strategy that decreased the odds of provider-interrupted quiet time included educating providers about the quiet-time initiative and asking them to round last on patients with quiet-time signs on their doors. Before the project started, providers were notified of the quiet-time initiative and goals through email. Another barrier to quiet-time success included nurses forgetting to take signs down after the quiet time ended. If signs stayed up consistently outside of designated quiet times, the signs would likely lose their significance and be disregarded. Nurses were reminded to chart each quiet time and take down the sign and place it back in the holder inside the room after the quiet-time period.

The next phase of the KTA framework involved selecting, tailoring, and implementing the interventions. This phase included the education of the unit staff regarding the importance of coordinating quiet times to increase maternal sleep. The team lead presented the quiet-time

project initiative to unit staff through two online staff meetings the month before the project start date. In the meetings, staff received education regarding the sleep promotion handout and how to discuss the quiet-time intervention with patients. In addition, they received training on effective infant soothing strategies and methods to empower support persons to care for newborns during maternal sleep times. Providers were updated and informed of the quiet-time initiative through an email. Support services, including financial, housekeeping, chaplains, lab, radiology, respiratory therapy, and lactation consultants, were notified through email of the quiet-time initiative and the importance of delaying patient rounds if signs were present on a patient's door. After the staff training and notifications were completed, the process change go-live date was approved by faculty and management. During go-live, the team lead was available on the unit to assist with the process change and identify problems with implementation. Reminder emails were sent 1 week before go-live and on go-live day-1. The team lead rounded frequently throughout the project to assess the project implementation and answer any questions. The go-live implementation period included 4 weeks. The team lead sent emails to the unit staff with current data regarding the quiet-time initiative each week of the project to provide real-time information about the project and encourage staff to continue to promote quiet times for each couplet. The implementation period was considered the pilot test in the KTA framework.

Human Subjects Protection

An exempt application was sent to the Montana State University Institutional Review Board (IRB), and approval was obtained. Additionally, the practice site required a privacy review and notification of the organization’s IRB regarding the project. The organization’s IRB approved the quality-improvement project, and the privacy review was completed successfully.

This QI project focused on collecting aggregate data and avoided collecting any personal data. The intervention was considered low risk and backed by research as sleep remains crucial for health. Mothers could opt-out of designated quiet times despite receiving education regarding benefits. Nurses were trusted to assess the level of maternal exhaustion critically. If the situation was unsafe for the infant to remain rooming-in, it was acceptable for nurses to offer nursery care.

Measures and Instruments

The primary tool utilized to measure this QI project included EHR chart reviews, which assessed the frequency of documented maternal sleep/rest occurrences and infants leaving the room for nursery care. The team lead contacted the hospital informatics team to determine the possibility of running reports from the EHR to collect this data. The hospital IT team did formulate a report that the team lead could use to access the patient charts during the project period in order to determine quiet-time occurrences and the percentage of infants brought to the nursery. The other tool utilized included a visual assessment by the team lead during unit rounds over the 4-week period. The team lead documented the frequency of correct quiet-time sign usage, sleep education pamphlet presence in room set-up kits, and quiet-time reminder checklist signs in the nursery and breakroom during the project period.

OUTCOMES

Data Collection

After obtaining IRB approval and completing the privacy review, the project lead worked with the unit manager and the chair to determine the implementation period. Data were stored in a secure, password-protected MSU online cloud and deleted after project completion. No patient demographic information was collected. Visual assessment by the team lead occurred during the project weeks. It included an assessment of the frequency of sleep education pamphlets being present in set-up kits and the presence of quiet-time reminder checklists for nurses hanging in the nursery and breakroom during the project weeks. The team lead also tracked the frequency of correct utilization of quiet-time signs during rounds.

Chart reviews looking for a documented quiet time every 24 hours for each postpartum mother were completed by the team lead during the 4-week implementation period. Additionally, chart reviews assessing for an increase in infants leaving the bedside and going to the nursery were completed with the goal of less than a 5% increase to remain compatible with Baby-Friendly goals.

Data Analysis

Evaluation of the process and outcomes comprised the next phase of the KTA framework. Descriptive statistical methods were utilized to interpret the data. The primary long-term outcome goal was evaluated by comparing the week-to-week percentages of mothers with documented rest time occurrences in the EHR. The frequency of documented quiet times in the EHR was recorded as a simple yes or no for each patient. Each day the patients who had a

documented quiet time were divided by the total number of postpartum patients and displayed as a percentage on a run chart. Daily percentages were averaged each week, and the data was compared week-to-week (see Appendices D and E).

One of the process-change goals included having nurses start charting patient sleep occurrences during hospitalization. Before this project, nurses had no requirement to chart patient sleep occurrences or quiet times on this unit, making it incredibly difficult to track sleep occurrences in hospitalized postpartum women. After staff education and project implementation, the expectation was for nurses to chart planned maternal quiet times/sleep occurrences in the EHR, enabling evaluation of the process change. The goal for documented maternal quiet times was increased every week of the 4-week project period.

The second long-term outcome was evaluated through chart reviews assessing infants in the nursery for maternal preference with the goal of no more than a 5% increase from baseline throughout the project period. The percent of infants in the nursery on average was assessed for the month prior to project implementation and compared to the week-to-week percentages of infants in the nursery during the project period. The short-term process-change goals were evaluated by the percentage of staff listed logged-in to the virtual quiet-time educational presentations and by evaluating if the educational sleep handout was approved, completed, and printed on time. The intermediate goals were evaluated through team-lead visual assessment and recording the frequency of correct sign usage and sleep education pamphlets present in room set-up kits.

Results

Participants

The training on the quiet-time initiative took place during two online staff meetings in January, 2022. Attendance included 42 out of 60 (70%) nurses and three support staff. Attendance was lower than expected, so an email containing the presentation and project details was sent to all unit staff members following the staff meetings. During team-lead rounds, every effort was made to seek out staff members who did not attend the training meeting to remind them about the email, provide information about the project, and answer any questions.

Process Measure Findings

The educational pamphlet was designed by the team lead, approved by hospital marketing as well as the unit council, and printed 2 weeks prior to the implementation start date. The night before implementation, the postpartum sleep education handouts were placed in all the available room set-up kits. Extra copies were placed in the cabinet with the other education handouts. Additionally, support staff responsible for making the room orientation packets were notified of the addition of the sleep handout. During 100% of team-lead rounds, all room set-up packs contained a postpartum sleep education handout. The cabinet with extra handouts was checked frequently, and additional handouts were printed and replenished to maintain an adequate supply.

The team lead created quiet-time reminder signs and placed them in the nursery and breakroom the night before the project started. All the quiet-time reminder signs remained in the

nursery and breakroom during 100% of the project period, as evidenced by a visual assessment during 12 team-lead rounding times.

Quiet-time signs were created and laminated by the team lead. Every room had a quiet-time sign and dry erase marker placed inside a clear wall folder in each room the night before implementation. During 12 rounding occurrences by the team lead during the project period, eight quiet-time signs were observed in use, and all had the time period marked clearly in dry erase marker. During rounds, the team lead checked empty rooms to make sure each room continued to have a quiet-time sign and marker present in the room for ease of use. Two rooms were found to be missing quiet-time signs on different occasions, so the team lead replaced the signs.

Outcome Evaluation Findings

The primary outcome goal stated that 75% of postpartum moms would have one documented rest time in the EHR every 24 hours during week 1 of the project period. The goal increased each week as follows: week 2, 80%; week 3, 90%; and week 4, 95%. During week 1, 51% (SD=37.9) of postpartum moms had a quiet time; week 2, 64% (SD=21.4); week 3, 57% (SD=18.7); and week 4, 62% (SD=22.5). Prior to the implementation, there were zero documented quiet times in the EHR.

The second primary outcome focused on rooming-in goals and stated: Infants out of their room into nursery will not increase by more than 5% during all project weeks as documented in EHR. During week 1 of the project, 53% (SD=25.2) of infants spent time in the nursery; week 2, 51% (SD=32.6); week 3, 22% (SD=15.4); and week 4, 38% (SD=28.1). During the 1-month implementation period, n=112, 42% (SD=27.3) of infants spent time in the nursery. In contrast,

in the month prior to implementation, the unit had 40.8% (SD=35) of infants spend time in the nursery. These data indicate that there was only a 1.2% increase in the percent of infants spending time in the nursery during the project period.

Project Conclusion

The final phase of the KTA framework focuses on sustaining knowledge use. This phase remains critical for sustaining the process change and utilizing the acquired evidence-based knowledge. The knowledge use was sustained during the project through frequent rounding by the team lead, visual reminder signs, and weekly update emails. A final presentation of the project's collected data and barriers occurred at the next unit council meeting. The unit council was willing to continue the improvement process and promote continued individualized quiet times for postpartum mothers.

After the project completion, the nurse practitioner student formally disseminated the QI project information and outcomes through a defense presentation to faculty and the public. This QI project could serve as a roadmap for future sleep-improvement projects to optimize maternal sleep in Baby-Friendly hospitals. Interest exists in expanding this project to other hospitals within the practice sites' health system. All the information, handouts, and quiet-time signs have been given to the regional Director of Patient Experience to utilize and distribute to other system hospitals that show interest in implementing a quiet-time intervention on their labor and delivery units.

Discussion

The goal for staff education was that >90% of staff members would attend the training. This goal was not met as only 70% of staff members attended the training. The remaining 30% received an email with the presentation. It is unknown if they watched it. The second short-term process goal of having educational sleep pamphlets designed by the team lead, approved by the unit council, and printed by 1-week prior to the project start date was met. Initially, the handouts were going to be printed on glossy pamphlet paper, but the cost was prohibitive, so regular printer paper was utilized. The third short-term process goal was that quiet-time reminder checklists for nurses would remain in the nursery and breakroom 100% of the time during the project period. The signs remained in place 100% of the time throughout the project period as visualized by the team lead during rounds. It is unknown how impactful these signs were or if they assisted nurses in remembering to plan and chart quiet times.

The first intermediate process goal included the sleep education pamphlets being placed in 100% of room set-up packets during the project period. The handouts were placed in all of the available room set-up packets the night before go-live and continued to be present in the packets during 100% of team-lead rounds. Initial printing included 150 handouts to ensure the unit would not run out during the project. Emphasis during the staff training was placed on showing each postpartum mom the handout during room orientation and discussing the quiet-time goal with each couplet during the project. While the handouts were present in the set-up packets, it is unknown how many nurses showed the handout to their patients. The second intermediate process goal included quiet-time signs being utilized correctly with the time period printed

clearly for designated quiet times during 100% of team-lead rounds. This goal was met with 100% of the quiet-time signs observed during 12 team-lead rounds.

The primary outcome goal for week 1 was that 75% of postpartum moms would have a documented rest time. Only 51% had quiet time documented. The quiet-time research examined in the literature review did not include quantity goals regarding quiet times. The outcome percentage goals were set ambitiously. An increase from zero to 51% was quite remarkable for week 1. During week 2, the goal increased to 80% with outcome results indicating 64% of postpartum moms had a quiet time. While not meeting the 80% goal, an increase of 13% from week 1 indicated that the rates of quiet time were improving. The week-3 goal increased to 90%, but results indicated a decrease between weeks 2 and 3, as only 57% of moms had a charted quiet time during week 3. It remains unknown what factors contributed to the decrease. It is possible that the novelty of the project may have worn off for some staff after 3 weeks and/or higher patient loads led to decreased quiet-time planning. The week-4 goal was that 95% of moms would have a quiet time. During week 4, 62% of moms had a charted quiet time, which increased from week 3, but week 2 remained the highest data point in the project period. A goal of 95% was optimistic and unlikely to be met after only a 4-week implementation period.

The second primary outcome goal included measuring the percentage of infants who spent time in the nursery after implementation. The goal was the percentage of infants spending time in the nursery would not increase by more than 5% during the project as documented in the EHR. In the month before the project, 40.8% of infants spent time in the nursery, while in the month after implementation 42% of infants spent time in the nursery. A slight increase of only

1.2% is reassuring that the quiet-time initiative does not appear to contribute to a significant increase in infants in the nursery.

An incidental finding that was appreciated while analyzing the data was that it appeared that mothers who only stayed 24 hours following delivery were less likely to have a quiet time charted. The first 24 hours following delivery are incredibly busy with required medical care for both mom and baby, the establishment of breastfeeding, and education. If a mom/baby couplet only stays 24 hours, it makes sense that it would be difficult for nurses to plan an effective quiet time with them before discharging due to time constraints and competing priorities. One unexpected finding from this data set is that mothers who delivered vaginally were 4.8% more likely to have a quiet time charted than mothers who delivered by Cesarean section (CS). The length of stay is significantly longer following a CS, which would provide a longer time window for nurses to plan quiet times with these moms. During the project period, 85 moms delivered vaginally compared to 29 delivered by CS. A possible explanation for the difference in quiet times by delivery type is that vaginal deliveries were more prevalent and thus more likely to have a quiet time.

Lessons Learned

Change remains difficult. Nurses were asked to change their hardwired practice and complete additional charting. The new charting location was set on the preexisting patient safety flowsheet. Nurses were asked to chart patient sleeping and annotate quiet time in the comment box on this flowsheet. Any change in EHR flowsheets at this hospital site requires approval from all the hospitals in the system. It might have increased the success of this project if a specific rounding flowsheet was built in the EHR that contained a one-click charting action for a quiet

time. If developed, an option could be included for "quiet time offered, the patient declined." It is impossible to know how many quiet times occurred that nurses forgot to chart or how many quiet times were offered that patients declined. However, a change request to the EHR was impossible due to project time constraints.

Prior to this project, no concentrated effort or strategy existed on the unit to assist postpartum mothers in getting sleep/rest opportunities in the Baby-Friendly setting. Through this project, an emphasis was placed on improving maternal sleep/rest opportunities through coordinated quiet times. Since Baby-Friendly practices often inherently interfere with maternal sleep, nurses recognize the need for postpartum mothers to get more sleep. However, the pressure to keep infants rooming-in at all times is perceived to contribute to poor maternal sleep and impaired recovery. One reassuring finding from the data is that this project did not significantly increase the number of infants spending time in the nursery, which aligns with Baby-Friendly goals.

Organizational buy-in remains critical for lasting change. Through chart reviews, it was apparent that a few nurses had charted many quiet times throughout the project period, some nurses had charted a few, and some did not chart even one quiet time. This observation pairs well with the diffusion of innovation theory developed by E. M. Rogers, who characterized five different adopter types: the innovators, early adopters, early majority, late majority, and laggards (Kaminski, 2011). The nurses planning and charting multiple quiet times fall into the innovator and early adopter categories. As the project progressed, a few nurses who had not previously charted a quiet time started adopting the change, which may indicate improved buy-in. A possibility remains that these nurses missed the live training and finally read through the

information in their email. In hindsight, it would have been beneficial to design a quiz for all staff to complete regarding the presentation's content to make sure everyone received and read the information. The unit manager would have needed to require staff to complete the quiz to be effective.

Limitations

Limitations of this quality-improvement project included the short, 4-week timeframe, the lack of a specific EHR quiet-time flow sheet, the inability to measure if sleep quantity was increasing due to the quiet times, the lack of documentation indicating a support person was present to assist during the quiet time, relying on nurses to chart quiet times, and the online format for the staff education due to the COVID-19 pandemic. Four weeks provided a snapshot of the data, but no specific trend was identified as the data were up and down likely due to the short timeframe. A longer project time period may have provided a better understanding of the intervention and quiet-time occurrences for mothers.

This project was limited by relying on nursing staff to remember to plan and chart the quiet times in the EHR. While beneficial, planning quiet times with patients does not take priority when nurses remain responsible for safe medical care and balancing full patient loads. When patient loads are higher, quiet-time planning and occurrence likely decrease. Charting requirements such as physical assessments and vital signs take precedence over quite-time charting. Instead of relying on nurses to complete more charting, a short patient survey at discharge asking about their rest and sleep during their stay would have helped improve the measurement and understanding of this quiet-time project. Due to time constraints and the IRB approval process, a patient survey was not possible.

Another limitation is that it remains impossible to know if maternal sleep increased just because a quiet time was planned. Numerous benefits besides sleep exist by implementing quiet time, such as increasing the mother/baby bonding opportunities, fostering a peaceful environment, and promoting relaxation by decreasing interruptions (Grassley et al., 2018). To understand maternal sleep quantity in the postpartum hospital setting, technology such as wrist actigraphy could be used to objectively measure sleep quantity, such as in the study completed by Park et al. (2013). Additionally, direct patient surveys about their perception of sleep and the nursing care supporting sleep would be beneficial to understand the impact of this project.

This project focused on empowering support persons, such as fathers or grandparents, to aid each mom by caring for the infant in the room while she slept. An effective way to measure support-person involvement is challenging to develop or assess unless this is added to the EHR quiet-time documentation.

A true and lasting change in practice takes time, extraordinary effort, and tenacity. One significant limitation of this quality-improvement project included the initial staff training being completed online due to the COVID-19 pandemic. The training took place in the first staff meetings of the new year, and attendance was suboptimal. Additionally, it is difficult to know how engaged the participants were as the majority had their cameras turned off, and few questions were asked after the presentation. All staff received the information in their work email, but it is difficult to know how many read the information and looked at the presentation.

Recommendations for Future Practice

Although this quality-improvement initiative did not meet the primary outcome goals set prior to implementation, the project still improved sleep/rest opportunities through quiet times

for over half the postpartum mothers during the project period. It is recommended that the unit council continue the quiet-time initiative at the practice site. Additional recommendations for the unit moving forward include creating and adding a specific EHR flowsheet for quiet times, adding quiet-time reminders into the EHR to encourage nurses to plan quiet times with their patients, focusing on support-person involvement, and designing a survey for patients after discharge asking about their sleep experiences in the hospital. The unit could also look at HCAHP scores in the future, as the quiet-time initiative may help improve unit quietness scores as suggested in the literature. In order to encourage longevity, a quiet-time/sleep-promotion learning module could be created that staff would be required to complete each year. This module would help remind staff about the importance of sleep promotion for postpartum moms and ensure that new staff members receive the quite-time education. Additionally, instead of giving patients a paper handout about sleep promotion, the education could be distributed virtually via a QR code or through an SMS message. A virtual delivery method may appeal to new millennial mothers and increase the likelihood of the information being received.

The quiet-time process change remains low-risk, cost-effective, and provides benefits for both moms and infants. The initial data are reassuring for other Baby-Friendly hospitals who may worry about worsening rooming-in rates due to the quiet-time initiative. During this quality-improvement pilot project there was only a 1.2% increase in infants spending time in the nursery, which is negligible. Recommendations for replication include recruiting multiple staff members to assist with the project in order to promote buy-in, completing the staff education in person, requiring a quiz on the content be completed after training, and focusing on support-person involvement to maintain Baby-Friendly goals.

Conclusion

Postpartum sleep disruption and fatigue remain detrimental to new mothers and infants. Research indicates that the relationship between poor sleep and an increased risk of postpartum depression and other adverse health outcomes cannot be overstated. The paradigm practice change in hospitals from nursery-assisted care to Baby-Friendly care has likely contributed to the exacerbation of maternal postpartum sleep disruption due to infant-caregiving duties. The purpose of this quality-improvement project was to increase rest/sleep periods for hospitalized postpartum mothers through the implementation of individualized quiet times.

Process outcome goals were all met except for the staff training goals, but all staff did receive the information through a live presentation or by email prior to the project start date. While the long-term project outcomes did not meet the initial set target goals, on average, 58% of mothers had quiet times during the practice weeks. Additionally, there was no significant increase in mothers utilizing the nursery for respite care during the project period. Prior to implementation, no mothers had formalized quiet times. An improvement of 58% is an excellent starting point to combat postpartum sleep disruption and fatigue. Hopefully, as the quiet-time practice becomes hardwired with the continued attention of the unit council, the number of postpartum mothers receiving a quiet time will continue to increase. This practice will assist with improving mother/infant bonding and maternal sleep opportunities.

REFLECTION

DNP Essentials

The last 3 years have been full of assignments and opportunities that have shaped me into a Doctorate-prepared Nurse Practitioner candidate. These experiences have enabled me to meet the DNP Essentials for Practice and grow into the DNP role. This journey has been challenging yet fulfilling. As I reflect upon this program, I feel prepared to be a healthcare nurse leader and provide holistic patient-centered care as a family nurse practitioner. I am thankful for the coursework and curriculum that I have completed in order to earn my Doctor of Nursing Practice degree.

Essential One

Essential one focuses on the scientific underpinnings of practice. In N602 Advanced Physio/Pathophysiology, I took a deep dive into disease processes down to the cellular level. I developed a case study on myxedema coma. I learned intricate and significant pathology about myxedema coma and numerous other disease processes through the extensive discussion posts and related case studies throughout N602. For me, the most helpful learning occurred while researching responses to case study questions written by classmates. At first, the discussions were overwhelming as I had forgotten pathophysiology learned in undergraduate studies. However, as the semester progressed, I grew more confident after research enabled me to answer discussions scientifically and accurately. Throughout N602, I learned to integrate science into the nursing process. I was empowered to understand disease processes. I can successfully help future patients prevent and treat illness through a foundational understanding of science.

Additional coursework that helped me meet this essential included physical assessment content in N601, pharmacology content in N603 and N620, learning strategies for diagnostic reasoning in N607, and extensive didactic content in my clinical courses N621, N622, N623, and N624. For me, some of the most useful experiences that will help me be a better clinician with a strong scientific foundation included presenting case studies in clinical seminars and the rich discussions that took place with my classmates and faculty in these seminars. Many clinical pearls were shared that enriched my knowledge base and will serve me for years to come. Through the N601 health assessment course, I have significantly developed my physical assessment skills and my clinical experiences have helped cement strong physical assessment skills learned in N601 into my practice. Working as a nurse over the last 12 years, I originally thought my pharmacology knowledge base was strong; but the coursework in N603 and N620 expanded my knowledge of pharmacology immensely. Prescribing medications is a significant responsibility and, through these courses, I have learned the importance of checking my resources and assessing possible interactions before writing any prescriptions for patients. One of my favorite classes in the curriculum was N607, Diagnostic Reasoning. I enjoyed practicing my diagnostic skills with the online DxR platform, which was a safe learning environment that helped me formulate a diagnostic plan that included the financial implications of the tests I ordered. As a result, I will strive to be a safe clinician by ordering tests when necessary, but also attempt to avoid over-ordering as my actions can have significant financial ramifications for my patients.

Essential Two

Organizational and systems leadership is the priority of essential two. In order to fulfill this essential, I researched and created a financial proposal to implement a Sexual Assault Nurse Examiner (SANE) program into my local hospital in N613. Sexual assault remains a difficult and traumatic event, and victims require comprehensive and compassionate healthcare. Through the proposal for a SANE program, I learned much more about comprehensive care for sexual assault victims and the interplay between legal and medical systems. At first, I thought it would be a simple proposal, but I did not fully understand the lengthy process required to become certified as a SANE nurse. I learned how to analyze the cost-effectiveness and needs of patient populations. I was able to gather sexual assault data specific to Montana. Although a SANE program would benefit both hospitals in Billings, the occurrence rate does not necessitate a duplicate program.

In N608, I completed a root-cause analysis utilizing a fishbone chart and the 5Whys methodology. I was able to identify factors that contributed to a severe medication error in the NICU and recommend process changes to prevent similar mistakes in the future. I engaged in examining healthcare delivery and design by creating multiple process flow charts and a value stream map. Through these methodologies, I was able to see the systems and recommend improvement objectively. Through the content in N608, I feel equipped to analyze healthcare system processes and designs accurately. I enjoyed creating visual charts and utilizing them to search for solutions and process-improvement ideas. As a future family nurse practitioner working in a clinical healthcare system, the stimulating concepts introduced and learned in these courses will be invaluable to me.

Essential Three

Essential three focuses on clinical scholarship and analytical methods for evidence-based practice. My scholarly quality-improvement project focused on improving postpartum sleep opportunities for hospitalized mothers in the Baby-Friendly hospital setting. Through N675, I critically appraised the existing literature and examined the evidence to understand the problem of postpartum sleep disruption and the best interventions in the literature to improve postpartum sleep. Utilizing the Knowledge to Action framework, I designed a new patient-centered quiet-time process for a local postpartum unit. I served as the project's team leader and implemented the project over 4 weeks. The project showed significant improvement, with an average of 58% of postpartum mothers receiving quiet times during their hospital stay over the project period. I evaluated the project and provided recommendations to help the unit continue and improve the practice change. The quality-improvement project provided a safe intervention focused on improving the quality of postpartum care that new mothers receive.

Essential Four

Essential four focuses on technology for the improvement and transformation of healthcare. I utilized the electronic health record (EHR) to evaluate project outcomes during my quality-improvement project. I worked with the hospital IT department and utilized an EHR report to gather needed outcome data. Through my project, I learned that it takes time to make changes to an EHR and that it is often difficult for nurses to embrace charting changes. Throughout coursework in N610, I learned how to evaluate consumer websites containing healthcare information and was able to teach consumers criteria for appropriate evaluation of healthcare information. I developed a plan for a communication tool integrated into the EHR to

enhance providers' communication and improve patient safety. Severe lapses in communication between providers were identified as risk areas, potentially causing patient harm. A plan for an electronic medical record-integrated handoff tool was developed, including a workflow analysis with steps including tool development, staff education, implementation, and evaluation. The tool was developed in a note format with smart-text links with the ability to pull relevant data from all areas of the patient's medical record in the EMR. A benefit of utilizing the electronic medical record included access to accurate and real-time data. Another benefit included maintaining the protection of patient health information as no health information was printed when the tool was utilized.

Essential Five

In N612, I worked to advocate for and promote policy change regarding safe firearm storage laws to prevent gun-related death and injury in Montana's youth. I completed careful research of the incidence and factors related to firearm injury in the United States and Montana. I analyzed the issue and sent letters to Senator Jon Tester, Senator Steve Daines, and Representative Greg Gianforte, including recommendations for mandatory, safe firearm storage laws to prevent firearm access to minors without supervision. I did not receive any responses, but I will continue to actively work to promote this issue as firearm-related suicide, injury, and unintentional death remain critical issues in Montana and the United States. Working as a nurse, I have seen firsthand the violence and destruction of unsupervised firearm access in minors. Promoting and implementing safe firearm storage laws can save lives from preventable loss and sequelae. As a nurse practitioner I plan to assess firearm safety and discuss safe storage with my patients, especially parents of minors.

Essential Six

The priority of essential six is interprofessional collaboration for improving patient and population outcomes. My quality-improvement project in N675 required effective communication and interprofessional collaboration for success. I met with the unit manager, unit educators, the IT department, and the Director of Patient Experience in the process of designing and implementing my postpartum-sleep project. I led an interprofessional team of nurses, certified nursing assistants, and lactation consultants. Before implementation, I provided education regarding the quiet-time intervention and, during the project, I provided support for any problems or questions that arose.

Essential Seven

In N614, I took a deep dive into learning about vulnerable populations, health disparities, and strategies to improve the health outcomes experienced by disparaged groups of people. I was a team member of the group focused on Latinos in Montana and the specific challenges this population faces. We collaborated by identifying community and individual factors that contribute to vulnerability. We identified current healthcare and social-support resources available for Latinos in the rural state of Montana. I was pleasantly surprised by the number of available resources and agencies working with this population, specifically the Montana Migrant and Seasonal Farm Worker Council. However, rates of chronic illness continue to increase in Latinos in Montana, necessitating future interventions and work to decrease vulnerability. Our group identified key strategies, including increasing cultural competency and increased mobile health clinic activity to support Latinos in Montana. We presented our research and findings in a final PowerPoint presentation.

For me, the most meaningful learning experiences in N614 included reading The Body Keeps the Score by Bessel Van der Kolk, interviewing staff from the Montana Migrant Council, collaborating with my team members on our presentation, and learning about many vulnerable populations. I met Essential Seven, by researching and synthesizing the multitude of factors that increase vulnerabilities in Latinos in Montana. I completed over 90 hours of clinical time researching and learning about vulnerable populations. I plan to continue to learn about strategies to provide culturally competent and trauma-informed care and implement them in my future practice.

Essential Eight

Essential eight focuses on the role of advanced practice nursing. My clinical courses N621, N622, N623, and N624 allowed me to interact with patients across the lifespan and provide care in the role of a family nurse practitioner. Throughout my 675 hours of clinical, I gathered patient histories, assessed patients, formulated differential diagnoses, determined a diagnosis, developed a plan, and decided appropriate follow-up for evaluation. I practiced motivational interviewing, provided health education, and utilized shared decision-making during my clinical patient visits. I learned invaluable skills in these clinical courses and from my preceptors. My clinical experiences reaffirmed why I desired to pursue my doctorate and become a family nurse practitioner. I am looking forward to a rich, fulfilling career as a family nurse practitioner.

Throughout semesters one and two of N675, I developed my leadership skills as an advanced practice nurse by designing and implementing a quality-improvement project. I led an interprofessional team intending to facilitate optimum care for postpartum moms and improve

patient outcomes by improving sleep opportunities while in the hospital. Through this project, I was able to facilitate and guide the project implementation and educate the unit nurses about the importance of postpartum sleep and the potential consequences of poor maternal sleep. Through the course of the project design, implementation, evaluation, and dissemination, I gained firsthand experience with leading a quality-improvement project. This experience will be invaluable as I graduate and move forward as a family nurse practitioner. I remain committed to advancing the nursing profession, not just through my clinical practice but through examining systems and processes in order to find and initiate improvement opportunities.

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APPENDICES

APPENDIX A

DATA ANALYSIS

Short-term outcomes		
Staff Education on Quiet times and documentation	Percent of staff who received education 70% n = 45	Percent of Staff who did not receive education 30%
Sleep Education Pamphlet approved by Unit Council and printed by one week before go live	**Met**	
Quiet time reminder checklists placed in nursery and staff huddle room for 100% of go-live weeks	Yes 100% of days present	No 0% of days not present

APPENDIX B

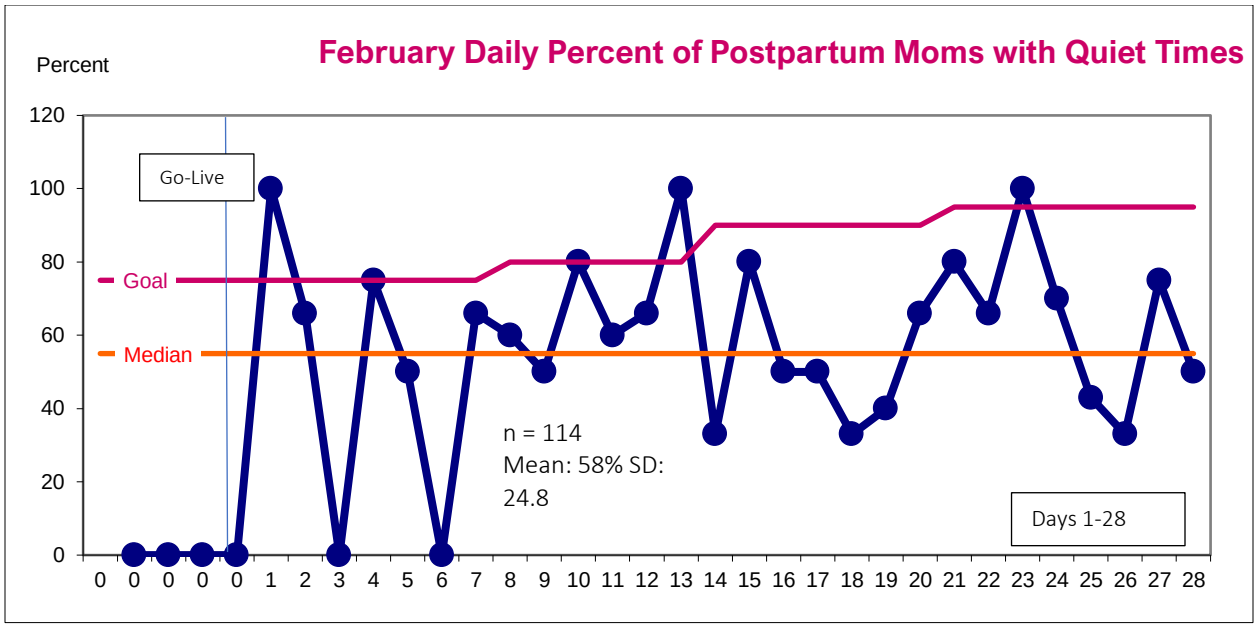
INTERMEDIATE OUTCOMES

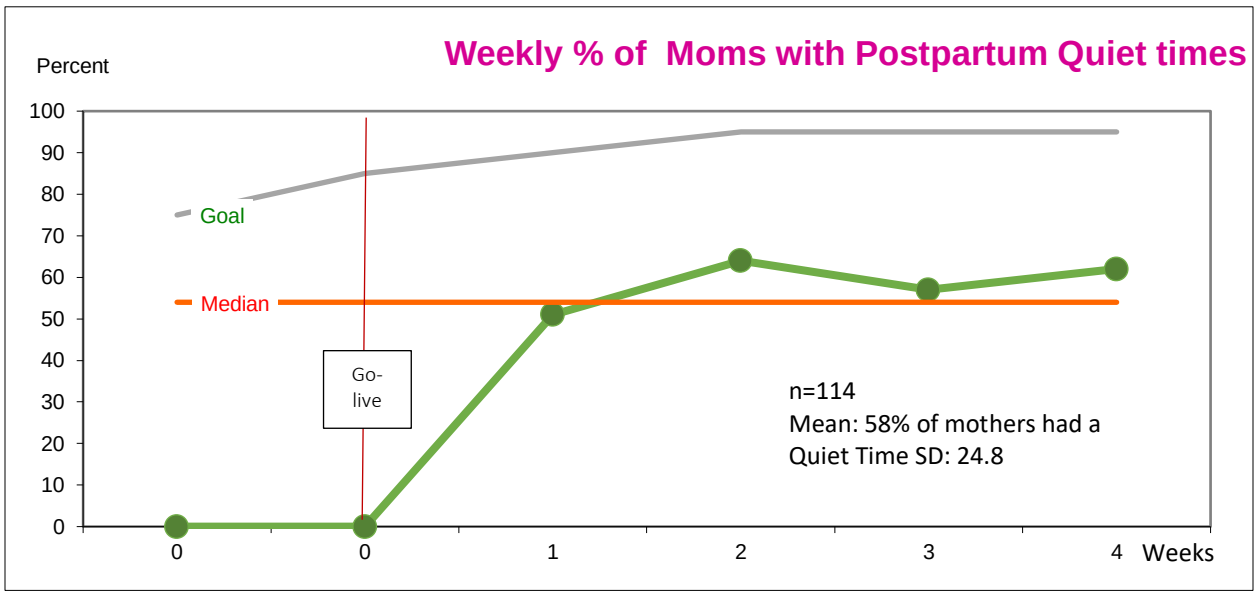
Intermediate Outcomes		
Sleep Education pamphlets present in 100% of room set up packs during go-live weeks	100% present During team lead rounds	0% not present During team lead rounds
Quiet time signs utilized appropriately with time window written in during team lead rounds	100% appropriate use n = 8	0% inappropriate use

APPENDIX C

LONG-TERM OUTCOMES: POSTPARTUM

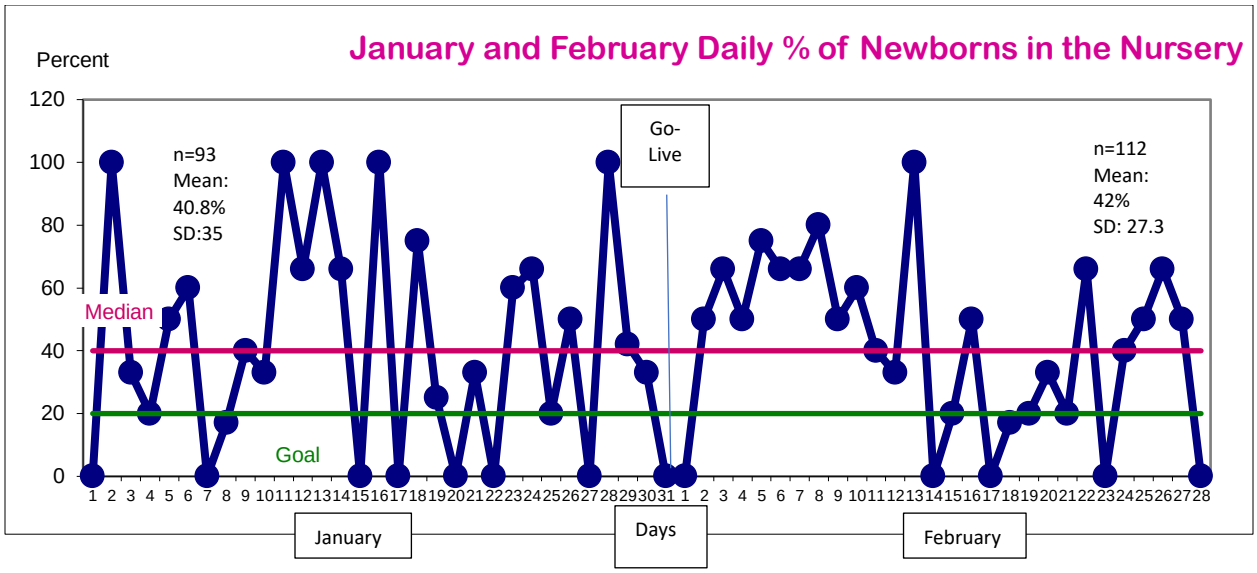
MOMS WITH QUIET TIMES

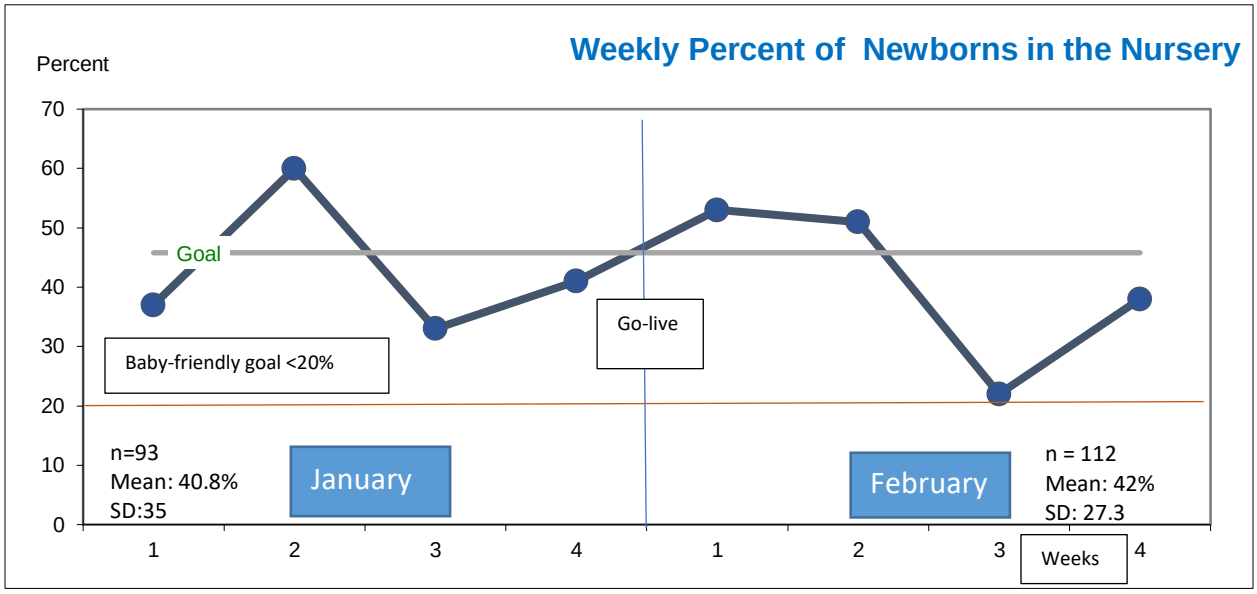

February Daily Percent of Postpartum Moms with Quiet Times
Percent
120
100
80
60
40
20
0
Go-Live
Goal
Median
n = 114
Mean: 58% SD:
24.8
Days 1-28
0 0 0 0 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28


Weekly % of Moms with Postpartum Quiet times
Percent
100
90
80
70
60
50
40
30
20
10
0
Goal
Median
Go-
live
n=114
Mean: 58% of mothers had a
Quiet Time SD: 24.8
0 0 1 2 3 4 Weeks

APPENDIX D

LONG-TERM OUTCOMES: NEWBORNS IN THE NURSERY


January and February Daily % of Newborns in the Nursery
Percent
120
100
80
60
40
20
0
n=93
Mean:
40.8%
SD:35
Go-
Live
n=112
Mean:
42%
SD: 27.3
Median
Goal
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
January
Days
February


Weekly Percent of Newborns in the Nursery
Percent
70
60
50
40
30
20
10
0
Goal
Go-live
Baby-friendly goal <20%
n=93
Mean: 40.8%
SD:35
January
February
n = 112
Mean: 42%
SD: 27.3
1
2
3
4
1
2
3
4
Weeks