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Almost all facilities provide newborns with a first bath that traditionally can cause newborn hypothermia which may lead to neonatal hypoglycemia, respiratory distress, metabolic acidosis, and death. (Andrews et al., 2018). Evidence-based practices (EBP) indicate that swaddle bathing provides a better outcome for a newborn versus traditional bathing (Denton & Bowles, 2018).

Problem Statement

Neonates are typically bathed in hospital nurseries as part of normal care; however, bathing habits can vary depending on a variety of reasons, including aesthetic, cultural, and personal preferences, health benefits, and other factors (Çaka & Gözen, 2017). In almost all settings, infants receive their first bath, which historically has the potential to result in newborn hypothermia, which can then induce neonatal hypoglycemia, respiratory distress, metabolic acidosis, and even mortality (Andrews et al., 2018). Andrews et al. (2018) concluded on a mother-infant unit, they observed a hypothermia rate of 29.1% for late-preterm infants and 9.5% for all low-birth-weight infants. Significant amounts of time and effort were being spent by nurses and doctors correcting hypothermia, which necessitated laboratory tests and possible NICU transfers.

According to Ceylan & Bolışık (2018), one of the most frequent issues that arise when bathing neonates is hypothermia. To protect the vernix and avoid hypothermia, the World Health Organization (WHO) suggests giving a bath 24 hours after birth. Previously it has been concluded that a bath that is not delivered at the proper time and under the right circumstances may harm the infant's ability to regulate his or her body temperature and increase both parent and

newborn stress (Çınar et al., 2020). Swaddle bathing has been shown to reduce hypothermia and improve family satisfaction (Denton & Bowles, 2018). De Freitas et al. (2018) educate that with swaddle bathing, the neonate is swaddled in a fleece blanket and placed in a tub of warm water up to the shoulders. The infant's limbs are removed from the swaddle one by one bathed and replaced to encourage continued swaddling. The neonate is rolled onto its side and the back is cleansed through the fleece while remaining swaddled. Re-educating nurses to implement a change in practice to use swaddle bathing may improve the quality of care and promote infant health (Çaka & Gözen, 2017).

PICO

Within the format of the population, intervention, comparison, outcomes (PICO) question, does swaddle bathing as compared to standard of care maintain or improve newborn temperature?

Background and Significance

According to Brogan & Rapkin (2017), The Association of Women's Health Obstetric and Neonatal (AWHONN) encourages the transition from open-air sponge bathing to immersion bathing, such as swaddle bathing, as it reduces the risk of hypothermia by heat loss. In turn, this makes skin-to-skin a more convenient option for rewarming versus a radiant warmer since the newborn's temperature does not drop as drastically. Skin-to-skin increases infant bonding and can be initiated by the mother or father. Swaddle bathing indicates a much healthier practice than the standard practice of open-air bathing. (Brogan & Rapkin, 2017)

Swaddle bathing has been shown to increase normothermia as compared to open-air bathing in newborns. Swaddle bathing increases the potential to decrease stress and exhaustion thus improving breastfeeding (Brennan et al., 2020). Denton and Bowles (2018) state that quick

open-air bathing can cause stress and result in long-lasting effects. These effects can include hypothermia, hypoglycemia, and decrease interest in breastfeeding among other issues. The swaddle bath involves the infant being swaddled in fleece and submerged in warm water to aid in a calm, stress-free bath. This helps the parents feel less anxious as their newborn is not crying. It also keeps the neonate in a state of relaxation which decreases physiological stress and can help the neonate to be more successful at breastfeeding. When neonates are stressed it can exhaust them and decrease the opportunity to practice feeding. Delayed swaddle bathing aims to preserve the vernix, the thick white substance found at birth (Denton & Bowles, 2018). Studies have shown that leaving the vernix intact for a longer period can improve the function of the skin barrier, protection from infection, skin cleansing and moisturizing, development of the acid mantle, and protection from the activity of host defense proteins that improve innate immunity (Lund, 2016).

Reluctance based on comfort can be a significant barrier to practice change. Implementing new practices can be difficult but seeing our colleagues implement new practices can make it a benchmark in care (Horsburgh & Ippolito, 2018). To encourage support of changes in practice within the nursing staff education on the benefits of swaddle bathing and leadership support will be a necessity. Leadership support and education encourage nurses to share the same passion as the educators on this policy change. A large barrier is nurses often believe they are better equipped to provide an infant bath more safely than parents (Brogan & Rapkin, 2017). Denton and Bowles (2018) guidelines help formulate the nurses' decision on which neonates can and cannot be bathed. The swaddle bathing technique leads to a closer bond with your patients' families as you involve them in their newborns care.

By including theories to support the teaching and justifications for change, it is possible to encourage the implementation of these evidence-based improvements. Both the synactive theory and Bandura's theory of social learning can be used to influence staff on the importance and implementation of swaddle bathing. The synactive theory focuses on the neonatal response to their environment (Macho, 2017). Bandura's theory of social learning influences changes in practice by using observational learning as a motivator (Horsburgh & Ippolito, 2018).

Theory

The synactive theory is based on the neonate's continuous response to the environment around them while adapting to the extrauterine life (Macho, 2017). Bembich et al. (2017) explain that outside the womb is environmentally different than the intrauterine environment the neonate came from. The synactive theory promotes attempting to mimic the intrauterine environment to reduce stress on the neonate. One of these ways to limit environmental stress is through swaddle bathing. Bandura's theory of social learning is observational learning, observational learning involves staff education through modeling, and in return, staff will be able to replicate this behavior at a level of expectations (Horsburgh & Ippolito, 2018). The environment can influence a neonate's adjustment outside the womb so linking the Synactive theory and the education of swaddling bathing into practice with Bandura's theory of learning in mind can lead to an easier transition for the neonate into extrauterine life.

The Synactive Theory

The synactive theory outlines the environmental effects on the development of the neonate. The neonate is accustomed to the intrauterine environment and every neonate will adjust to life outside the womb differently (Bembich et al., 2017). Environmental stressors placed on the neonate more specifically a premature neonate can cause a response to one or more

of the neonate's subsystems (Bembich et al., 2020). According to Bembich et al. (2020), the synactive theory emphasizes that these subsystem responses can occur independently or have multiple responses. If one subsystem is altered this can affect the homeostasis of other subsystems. The synactive theory suggests that if the neonate has a negative response the infant should be placed in an environment conducive to homeostatic restoration (Bembich et al., 2020). When observing stressful triggers it is important to notice and return to a peaceful environment (Bembich et al., 2017).

Bandura's Theory of Social Learning

Bandura's theory of social learning is based on observational learning. Four different aspects make up the components of Bandura's theory including attention, retention, reproduction, and motivation (Horsburgh & Ippolito, 2018). These components are explained by Horsburgh & Ippolito (2018) concluding that the attention portion of social learning involves observing the educator modeling the behavior. This leads to the retention by the learner of what was observed. The end goal is for the learner to reproduce this observation themselves at an appropriate level of competency. Motivation involves encouraging the learner to achieve the competencies learned meeting a level of expectation (Horsburgh & Ippolito, 2018). Each learner has a different motivational factor influencing their competent execution of the learned behavior.

Horsburgh & Ippolito (2018) explain the motivational incentives Bandura suggests are categorized into three types; direct reinforcement, vicarious reinforcement, and self-reinforcement. Direct reinforcement involves a reward for positive behavior. Horsburgh & Ippolito (2018) proceed by explaining vicarious reinforcement is when the learner observes a colleague receiving a reward thus encouraging them to meet the same achievement for recognition. Horsburgh & Ippolito (2018) continue stating that self-reinforcement is rewarding

oneself for achieving the set behavior at a level of expectation. It is important to offer an incentive for achieving the competency being taught.

Theory's Influence on Advanced Practice of Nursing

Due to the adverse effects, the environment can cause to a premature neonate some interventions have been suggested to try and recreate the mother's womb and decrease environmental stimuli. Macho (2017) observes that recreating the intrauterine environment externally to the best of our abilities decreases the risks of immediate physiological responses to stress which can lead to the need for medical intervention. Recreating this intrauterine environment also decreases the chances of future developmental issues. The advanced practice registered nurse (APRN) works with these neonates both in the neonatal intensive care setting and the primary care setting post-discharge (Keels et al., 2019). Decreasing environmental stress reduces the possible need for immediate medical interventions and may reduce future developmental issues needing the APRN's attention (Macho, 2017).

Humans thrive on interaction making observational learning an encouraging environment. According to Bandura's theory of learning our environment has a large impact on post-graduate provider learning (Caverzagie et al., 2019). Horsburgh & Ippolito (2018) observe that in the medical community those learning often admire educators inspiring them to observe, retain, and model the teaching themselves. This admiration encourages the learner to be successful. Caverzagie et al. (2019) conclude APRNs can use their ability as role models to other nurses, APRNs, and providers to earn the trust of the colleagues they are teaching. APRNs can be the role models needed to encourage modeled behavior. The APRN has the advanced practice knowledge to fill the role model responsibility and provide education to others. (Horsburgh &

Ippolito, 2018). Modeling behaviors, more specifically clinical and procedures in the medical community are common.

Theoretical Framework Analysis

The two theories chosen as the frameworks for this project are the synactive theory and Bandura's theory of social learning. The synactive theory has been used to support neuroprotective care policies in numerous neonatal units across the country decreasing the risk of neonatal stress related to the environment surrounding at-risk neonates (Macho, 2017). Ceylan & Bolışık (2018) state change in the environment can negatively affect the neonate's baseline state. This increase in stress can lead to the need for increased medical intervention and negatively impact development. These policies help neonates cope better outside the womb and many have stemmed from the synactive theory. Swaddle bathing has been shown to reduce the stress response, crying time, and decrease the risk of the negative physiological effects sponge bathing can cause (Ceylan & Bolışık, 2018). Providers should be educated on the benefits of adding swaddle bathing to their developmental care plans.

Bandura's theory of learning focuses on the use of role-modeling behavior in education (Horsburgh & Ippolito, 2018). Horsburgh & Ippolito (2018) point out that APRNs have the advanced practice knowledge to be viewed as leaders in nursing. Leaders encourage others to model their behaviors. Horsburgh & Ippolito (2018) continue to explain that advanced practice registered nurses can provide education in the neonatal intensive care unit and the postpartum unit as role models to other staff. Modeling evidence-based practice related to developmental care to nursing staff reduces the negative outcomes for neonates (Milette et al., 2017).

Horsburgh & Ippolito (2018) discuss when implementing Bandura's theory of learning into advanced practice, emphasis should be placed on being present and engaged with the

learners. They also suggest learners have exposure to role models that currently implement these observations in their practice. The APRN wants to ensure there are multiple teaching styles as everyone learns differently. Providing an environment that feels safe and open for questions, answers, and criticism without the fear of judgment is important (Caverzagie et al., 2019). Making sure the language is at an understandable level, explaining the rationale for implementing changes in their practice, offering open reflection to verbalize questions and answers, and writing down what is learned (Horsburgh & Ippolito, 2018). Horsburgh & Ippolito (2018) acknowledge these suggestions encourage better retention from the learner and assist in reproduction by offering time to practice and feedback. Feedback should be constructive criticism, so the learner feels open to change instead of feeling judged. Giving the learner positive reinforcement and encouragement inspire evidence-based change with less hesitation from the learner (Horsburgh & Ippolito, 2018).

Theoretical Contribution to APRN Profession

Educating staff using an effective teaching theory may promote positive neonatal outcomes. Bandura's theory of learning promotes a positive learning environment which is important to the development of post-graduate providers (Caverzagie et al., 2019). Horsburgh & Ippolito (2018) confirm that using Bandura's four-stage model in educating staff increases the motivation of learning if staff see providers implementing the teaching into their practice. Viewing the APRN as a role model and leader increases the retention of those learning from a role model. Implementing new practices can be difficult but seeing our colleagues implement new practices can make it a benchmark in care (Horsburgh & Ippolito, 2018). Using Bandura's theory of learning and implementing it in teaching in medical communities may provide the next

generation of nurses, nurse practitioners, and healthcare providers the education they require to provide care based on evidence.

The synactive theory of environment relating to neonatal developmental care begins at delivery and continues after discharge. Appropriate developmental care for the neonate involves a multidisciplinary team including nurses, neonatologists, pediatricians, neonatal nurse practitioners, pediatric nurse practitioners, speech therapists, occupational therapists, and physical therapists (Craig et al., 2015). Educating staff on current developmental care recommendations for the neonate may reduce environmental stress (Milette et al., 2017). Adding swaddle bathing to developmental care initiatives may decrease the number of medical interventions needed due to environmental factors (Ceylan & Bolışık, 2018). In turn, this improves patient outcomes.

Theories Implications to Guide Personal APRN Practice

Applying the synactive theory into practice and focusing on the negative effects environmental stressors can have on the neonate is imperative. Personal practice involves following developmental care guidelines supporting neuroprotective measures for the neonate that are developed based on the synactive theory (Milette et al., 2017). Milette et al. (2017) encourage adding into practice the following core measures to medical practice, ensuring the neonate's sleep is protected, the neonate's stress and pain are assessed and managed, attention is given to ensuring the provision of age-appropriate activities of daily living, family-centered care is provided to the infant's family, and a healing environment is provided. These can be supported by involving a multidisciplinary team including nurses, neonatologists, neonatal nurse practitioners, pediatricians, pediatric nurse practitioners, speech therapists, occupational

therapists, and physical therapists (Craig et al., 2015). Applying these to personal practice is important but educating others and involving institutions is important as well.

Bandura's theory of learning involves observational learning and modeling. Role models help students learn and develop better clinical communication (Horsburgh & Ippolito, 2018). Milette et al. (2017) suggest educating staff and implementing developmental care guidelines in facilities. In practice educating all staff on the care team on the importance of these neuroprotective measures relating to the environment. Role models such as APRNs could impact practice development as role models in the profession (Horsburgh & Ippolito, 2018). As an evidence-based expert in nursing, it is important to use this role to educate others (Fencl & Matthews, 2017).

Literature Search

To determine the outcome swaddling bathing has on neonate post-bath temperatures, a literature search was conducted. The databases Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Pub Med were used. The following search terms: "Neonate" or "Infant" or "newborn" AND "Bathing" or "Bath" yielded 5,925 results. Only peer-reviewed, current studies within the past five years were included, and access to the full text of the article(s), narrowed the search to 1,366 articles. Additional search terms of "Swaddle bathing" or "Swaddle bath" were added, narrowing the results to 13 articles. The search was narrowed down to studies that evaluate the effect of swaddle bathing on temperature outcomes. The final search resulted in five total studies; two randomized crossover trial studies (De Freitas et al., 2018; Serap Ceylan & Bolışık, 2018); one randomized controlled experimental trial (Çaka & Gözen, 2017); one randomized clinical trial study (Huang et al., 2022); and one mixed methods research design study (Çınar et al., 2020).

Following a thorough review search of the literature, the results were narrowed down to five pertinent research articles. The following themes, definitions of conventional bathing practices, temperature measurement, and evidence for temperature control were identified. This review will examine the positives, shortcomings, and limits when analyzing whether swaddling bathing as compared to the standard of care maintains or improves neonatal temperatures.

Definitions

This project will use the following definitions:

1) *Swaddle bathing:* In this technique, the baby is wrapped in a soft blanket or piece of cloth and placed in a flexed, midline position before being gently submerged in a tub of warm water (Lund, 2016).
2) *Sponge bath:* Bathing the infant one limb and area at a time using wet gauze in an open area. This is either done under a radiant warmer or in some cases open air and the neonate is placed skin to skin to warm following a sponge bath (Lee, 2002).
3) *Hypothermia:* The World Health Organization divides hypothermia into three categories: mild (96.8°F to 97.7°F), moderate (89.6°F to 96.6°F), and severe (89.6°F or lower) (Andrews et al., 2018).
4) *Temperature:* The body's temperature can be measured using a variety of digital thermometers at various places. Temperatures taken in the anus are most accurate when taken rectally. The next most precise reading is the forehead temperature. If done correctly, taking your oral and ear temperatures are accurate. Although armpit temperatures are the least accurate, you can screen a child of any age using this technique (American Academy of Pediatrics [AAP], 2020)

5) *Newborn:* A child under 28 days old is known as a newborn infant, neonate, or newborn (World Health Organization [WHO], n.d.).

6) *Improve:* To enhance in terms of worth or quality; to make better (Merriam-Webster, n.d.)

Literature Review

This review assessed the benefits, drawbacks, and need for further research, found in a literature search to determine whether swaddling bathing, in comparison to the standard of care, maintains or improves newborn temperatures. The themes to be discussed in further detail include the bathing environment, temperature measurement methods, and timing of the first bath. Although there were some inconsistencies between the studies reviewed, four of the five studies found support in their results to encourage swaddle bathing versus traditional bathing practices of a newborn.

Bathing Environment

There is no clear definition of what traditional bathing entails. When reviewing the five studies that resulted from the literature search performed four of the baths were executed by nurses. However, Çınar et al. (2020) gave the parents instruction and materials before releasing them so they could perform the study at home and record the data before and after a bath. Four of the studies also had the same approach to traditional bathing by approaching traditional bathing in the same procedure as a swaddle bath by submerging the infant in the tub bath without the neonate swaddled in an open-air environment. Ceylan & Bolışık (2018) elected to have the traditional bath performed under a radiant warmer. Newborns' bodies have been heated using radiant warmers in neonatal settings, it aids in keeping babies' bodies at a consistent temperature and lowers their metabolism rate (Koh & Yu, 2016). This inconsistency made it difficult to compare results.

Although one study used a radiant warmer, the other four studies were carried out in an open setting that did not encourage the rewarming of the neonate as a radiant warmer does. There was a large differential range for bath water temperature. Huang et al. (2022), Çaka & Gözen (2017), and Çınar et al. (2020) all maintained the same bath temperature range between 98.6 F to 100.4 F, Ceylan & Bolışık (2018) was very similar to the other three with a range of 99.7 F to 100.3 F, however, De Freitas et al. (2018) kept their low end and the other four studies high end with a range from 100.4 F to 102.2 F. The air temperature range between Huang et al. (2022) and Çaka & Gözen (2017) was the same between 78.8 F and 82.4 F with humidity considerations resulting in a resulting, per Çaka & Gözen (2017), a *p*-value of .247 for room temperature and a *p*-value of.620 for water temperature. Huang et al. (2022) did not apply a *p*-value for environmental considerations just results as discussed below. Çınar et al. (2020) allowed for a lower upper air temperature of 78.8 F to 80.6F with humidity considerations with a *p*-value of .494 for room temperature and .493 for water temperature. De Freitas et al. (2018) had a much broader range of 77 F to 82.4 F with no humidity and did not assign a *p*-value to environmental considerations just results as discussed below. Lastly, Ceylan & Bolışık (2018) allowed for the coldest air temperature range of 77.5 F to 78.1 F and did not take into consideration humidity and did not assign a *p*-value to environmental considerations just results as discussed below. The gaps involve the differences in environments including air temperature, water temperature, humidity, and the person providing bathing. However, with these inconsistencies, they all saw an increase in the neonate's rebound temperature at the second temperature check that was higher in the swaddle-bathed group versus the traditionally bathed neonates.

The consistencies between the multiple studies provide a strength in comparison however the different external factors can be viewed as weaknesses via an inconsistent environment for comparison. Traditional bathing is difficult to define because it differs depending on the setting, culture, and hospital policy. Depending on the temperature of the surroundings, the water's temperature, and the location of the bath itself, the environment can change. Strengths include the consistent outcome regardless of inconsistencies between all five studies. Although these studies did vary in environmental factors only Ceylan & Bolışık (2018) was the only study with a significant difference in air temperature. Same with bath temperature all were very close except De Freitas et al. (2018) which had a much higher bath water temperature of 100.4F to 102.2F, these studies' low temperature is consistent with all other four studies' high temperatures.

Although some of the environments may have differed slightly it is cohesively agreed that mimicking the intrauterine environment is the most beneficial to the neonate. The intrauterine environment is warm and fluid-filled (Ceylan & Bolışık, 2018). The uterine environment, which is familiar to the newborn, should be compared to that of a tub bath (De Freitas et al., 2018). By recreating the comfortable and secure uterine environment during immersion, swaddling offers neonates a relaxing and stress-free bathing experience (Ceylan & Bolışık, 2018). Infants who are swaddled have less physical and motor stress, feel more at home in the womb, and continue to feel trusted (Çaka & Gözen, 2017). Recreating a comfortable and secure uterine environment, swaddled bathing is a harmless and secure technique of care that gives newborns a relaxing, stress-free bathing experience (Huang et al., 2022). It was agreed upon throughout all the studies that swaddling bathing is more similar to the intrauterine environment versus a traditional bath.

Temperature Measurement Method

There are numerous methods to measure temperature. Of the five studies reviewed they all differed in their mechanism of temperature measurement. Huang et al. (2022) did not specify what method of temperature measurement was used in their study. They did however specify that the temperatures were taken ten minutes before the bath, immediately following, and again ten minutes post bath. Çaka & Gözen (2017) and Çınar et al. (2020) both utilized the use of noncontact infrared thermometers. Çaka & Gözen (2017) state they implemented temperature checks before the bath and again ten minutes after the bath. Çınar et al. (2020) were not clear as to when they completed temperature checks stating they provided temperature checks five minutes before and after. It was unclear if this was immediately after or five minutes after. The last two, Ceylan & Bolışık (2018) and De Freitas et al. (2018) both employed the use of axillary temperature readings. These two also implanted more frequent and extended temperature checks. Ceylan & Bolışık (2018) checked before the bath and then again after the bath at one minute, five minutes, 15 minutes, and 30 minutes post-bath. De Freitas et al. (2018) checked at ten minutes before the bath and then again at ten minutes and 20 minutes after. This led to a gap in results related to a lack of a gold standard related to the temperature measurement method.

Between these five studies not only did the method of measurement differ from study to study but the times at which the temperatures were checked. Of the studies, four of the five did a temperature check at least ten minutes post bath to allow for temperature recovery with all seeing an increase in temperature higher in the swaddle-bathed babies versus the traditionally bathed. All checking at ten minutes post bathing is a strength in the review. Other strengths in these studies include providing the exact procedure for measuring and also the studies that had consistent post-bath monitoring to see the temperature trends of the neonate. A large weakness is the inconsistency between them all in timely monitoring and then also the lack of a consistent

measurement method. Per Çınar et al. (2020) moving the infrared thermometer to a new environment can affect the accuracy of the measurement. Due to this, they required a ten-minute wait period when moved to a different environment until use was acceptable. It was also specified that the thermometer should be five centimeters to eight centimeters from the forehead to the brow area. This difference in methods and accuracy lead to limitations in the validity of measurement between the five studies. Although they all had different measurement methods and times a consistently increased recovery of infant temperature was seen quicker in the swaddle-bathed neonate versus the traditionally bathed babies across all five studies.

When comparing all five having a constant in varying factors including measurement methods and time frame of temperature measurement can provide the consistency needed to accurately form conclusions. The data was analyzed to see if infant swaddle baths had improved infants' ability to regulate their body temperatures. Even though different measurements were used only one study, De Freitas et al. (2018), did not agree with any difference in temperature control when comparing swaddle bathing versus traditional bathing however, the other four, Çaka & Gözen (2017), Ceylan & Bolışık (2018), Çınar et al. (2020), and Huang et al. (2022) did even if not initially by the ten-minute post bath the swaddle bathed neonates had recovered thermodynamically versus the traditionally bathed newborns.

Timing of the first bath

Neonates are typically bathed in hospital nurseries as part of normal care; however, bathing habits can vary depending on a variety of reasons, including aesthetic, cultural, and personal preferences, health benefits, and other factors (Çaka & Gözen, 2017). According to Ceylan & Bolışık (2018), one of the most frequent issues that arise when bathing neonates is hypothermia. To protect the vernix and avoid hypothermia, the World Health Organization

(WHO) suggests giving a bath 24 hours after birth. Previously it has been concluded that a bath that is not delivered at the proper time and under the right circumstances may harm the infant's ability to regulate his or her body temperature and increase both parent and newborn stress (Çınar et al., 2020).

All five of these studies followed the WHO guidelines by waiting a minimum of 24 hours however the bathing age varied with two of the studies giving no definitive mean age at all. This also varied due to gestational age as well since some of these studies were done on premature neonates versus full-term neonates. This leads to a gap related to the difference in gestational and bathing ages and the neonate's ability to rebound thermally. De Freitas et al. (2018), Ceylan & Bolışık (2018), and Huang et al. (2022) featured premature neonates. De Freitas et al. (2018) did not specify the mean age of the neonate at the time of bathing but did state that neonates were older than 24 hours of age. Ceylan & Bolışık (2018) and Huang et al. (2022) had the oldest age neonates with the Ceylan & Bolışık (2018) being a mean age of 10.34 days and Huang et al. (2022) featuring infants with a mean swaddle bath age of 8.77 days and traditional bath 9.80 days this provided a *p*-value of .624. Çınar et al. (2020) neonates had a *p*-value of .322 featuring swaddle bath babies with a mean age of 3.58 days old and traditional babies at 3.32 days old. Çaka & Gözen (2017) with a *p*-value of .762 had a mean swaddle age of 1.38 days old and a traditional bath age of 1.43 days old.

Strengths include that all the studies followed the WHO guidelines by making sure infants were stable and over 24 hours of life before bathing. The neonates that were over a week old at the time of bathing were premature babies ranging from 30- 37 weeks gestation and in a smaller weight range versus the one-to-three-day-old babies at the time of bathing featured in both Çınar et al. (2020) and Çaka & Gözen (2017) that were full term or discharged home stable

infants that were over 2500 grams. Preterm and low birthweight infants are more likely to develop hypothermia (Çaka & Gözen, 2017). The inconsistencies between defined gestational ages and days of life leave a gap and weakness in this literature review.

Although these studies had a gap with different gestational ages and days of life when introducing bathing, a consistent increase across four of the five studies related to temperature recovery post-swaddle bathing as compared to traditional bathing was concluded. De Freitas et al. (2018) found that infant body temperature decreased in both swaddle and traditional bathing. However, this study was performed on preterm infants. This study had strength in being a double-blind study however, it was videotaped causing the inability to check vital signs including temperature during the bath resulting in temperature results being delayed to 10 minutes post bath. Çınar et al. (2020) conclude that the temperature of the newborns was better kept in the swaddle bath group. A large limitation of this study is the sample size was small. This study was also performed on babies who had been released and whose mothers had bathed them, this study was also carried out in patient homes. Serap Ceylan & Bolışık (2018) found in that body temperatures were considerably lower after sponge washes than after swaddling baths. This study has the strength of being a crossover study to prevent bias however weaknesses as it was performed at one hospital. Huang et al. (2022) noted a drop in body temperature in both bathing groups however, discovered the swaddle-bathed group was more effective in restoring body temperature. This study was performed on premature infants and there was no mention of what temperature measurement method was used. Lastly, Çaka & Gözen (2017) found that the body temperature decreased more in the traditional bath group versus the swaddle-bathed group. This study was performed on term infants using an infrared thermometer. Due to the differences in bathing environment, temperature measurement, and timing of the newborns' first bath along

with the different gestational ages of all neonates, further studies should be evaluated. Although there are some discrepancies in the different measurements and ages four of the five studies still saw an increase in either initial bathing temperature or temperature recovery.

Conclusion

Swaddling healthy newborns in the newborn nursery is a safe and satisfying alternative to sponge washing, according to the findings of this quality improvement literature review. In terms of preserving baby temperature and limiting heat loss in newborns, swaddling appears to be more successful than sponge washing, which in turn promotes the process of extrauterine adaption. The information suggested that the advantages of swaddling bathing concerning thermal stability should be considered. It is a safe practice to switch from bathing to swaddling healthy, late, preterm, and term newborns in mother-baby units to help with heat regulation. Although all five studies showed promising results in improving neonatal temperature post bathing. There is no definitive gold standard for neonatal bathing at this time. More specific populations with gestational age and days of life when bathing could be suggested. However, since all five studies saw an increase in thermal response to swaddle bathing, a change in practice to swaddle bathing from traditional bathing should not be disregarded as the benefit seems to outweigh the lack of risks in neonatal outcomes.

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