IMPACT OF HEALTHCARE PROVIDER EDUCATION RELATED TO SAFE SLEEP PRACTICES ON CARE DELIVERY: PILOT STUDY

A Scholarly Project
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By

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Dedication

I was first made aware of the prevalence of Sudden Unexpected Infant Deaths (SUIDs) when in 2009 I arrived at New York City Children’s Services. My position as the Senior Director of Clinical Programs and Services was to oversee the medical care for nearly 16,000 children in the foster care system at that time. I could not believe that one baby died each week from SUID in New York City and that this information was not generalized to the public. Working closely with the New York City Office of Chief Medical Examiner, I was even more astonished to discover that most of these deaths were preventable. From the moment I discovered this, I vowed to learn as much as I could so that someday, these deaths would not be in vein. This project is dedicated to all the infants who have perished from SUIDs and it is my sincere wish that through perseverance and education, we will prevent these healthy infants from being placed in unsafe sleeping environments so they can grow up with their families and learn all the possibilities this precious life has to offer.
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# Table of Contents

Chapter 1 - Introduction to Infant Safe Sleep ................................................................. 1
Statement of Problem ........................................................................................................ 3
Significance of the Problem .............................................................................................. 8
Organizational Needs Assessment ..................................................................................... 10
Research Questions/Aims ................................................................................................. 11
Purpose of the Study ......................................................................................................... 12
Theoretical Framework/EPB Model of Implementation .................................................... 12

Chapter 2 – Review of the Literature ............................................................................. 14
Introduction to Search Criteria ........................................................................................ 14
Critique and Synthesis of Previous Evidence .................................................................... 15
Rationale for Project .......................................................................................................... 18

Chapter 3 – Methods ....................................................................................................... 20
Study Design .................................................................................................................... 20
Procedures ........................................................................................................................ 20
Sampling Plan ................................................................................................................... 20
Educational Module .......................................................................................................... 21
Sample Recruitment ......................................................................................................... 21
Intervention ....................................................................................................................... 22
Data Collection .................................................................................................................. 23
Data Analysis ..................................................................................................................... 24

Chapter 4 – Evaluation of Results .................................................................................. 25
Demographics .................................................................................................................... 25
Comparison of Pre-test/Post-test Results ........................................................................ 28
Chapter 5 – Discussion of Findings ................................................................. 31
Limitations ........................................................................................................ 34
Implications for Practice .................................................................................. 34
Conclusions ........................................................................................................ 35
Bibliography ....................................................................................................... 36
Appendix A: Approval ....................................................................................... 42
Appendix B: AAP Safe Sleep Recommendations 2011 ............................... 43
Appendix C: AAP Safe Sleep Recommendations 2016 ............................... 46
Appendix D: Definition of Terms .................................................................... 48
List of Figures

Figure 1: Graph of Pre-test/Post-test Analysis Scores....................................................................29

List of Tables

Table 1: Sample Demographic Characteristics ................................................................................26
Table 2: Percentage of Correct/Preferred Responses at Pre-test/Post-test ................................29
Table 3: Safe Sleep Recommendations 2011 .............................................................................43
Table 4: Safe Sleep Recommendations 2016 .............................................................................46
ABSTRACT

The purpose of this study was to increase the knowledge level and change self-reported behavioral intent among a sample of healthcare providers regarding safe sleep messaging. From 1995 through 2015 in New York City, an average of one infant died every week from unsafe sleeping conditions. One agency in New York City experienced four unsafe sleep infant deaths within two months in 2010. In 2011, the city provided case managers with training on infant safety. Before this training, up to six sleep-related infant deaths were reported annually. The following year, one sleep-related infant death occurred. None occurred during the second year subsequent to the training. Current literature demonstrates healthcare providers have considerable influence on safe sleep messaging. This current study utilized a similar educational training designed for healthcare providers working in an urban health facility.

A single group pre/post-test quasi-experimental design was delivered to 23 participants. The design incorporated an online educational intervention in order to increase healthcare provider’s knowledge level and change their self-reported behavioral intent to educate parents and caregivers on the importance of safe sleep practices. Data were gathered at pre-test and post-test to assess changes.
Final analysis, using a repeated measures general linear model, was carried out on data from the twenty-three participants who returned completed pre- and post-class surveys. There was a statistically significant change in the overall 13-item composite score reflecting knowledge level and change the self-reported behavioral intent from pre-test (M=6.13, SD=2.78) to post-test (M=8.78, SD=3.79) at the p <.001 level. These findings support current literature recommendations for healthcare providers to incorporate the safe sleep message into their practice. Nonetheless, supplementary research is needed to conclude whether these results coincide with communities elsewhere and to examine the issues regarding knowledge and behavioral intent regarding safe sleep messaging.
Chapter 1- Introduction to Infant Safe Sleep

Historians and scientists throughout the world have documented the tragic and mysterious deaths of otherwise healthy infants for millennia. In the 1960s, researchers declared that these deaths were likely due to an unknown medical condition and coined the term Sudden Infant Death Syndrome (SIDS) (Malloy & Ramirez, 2013) to describe it (Bergman, Miller, & Beckwith, 1966). Despite efforts to understand causal relationships and implement preventive measures to stop these deaths, an average of one infant still dies every week in New York City from SIDS (Cohen-Spira et al., 2014). SIDS is defined as the sudden death of an infant where the reason for death cannot be determined even after a thorough investigation, a complete autopsy, and a review of the clinical history (“About SUID and SIDS,” n.d.). A SIDS diagnosis offers no explanation to bereaved parents. Conclusive evidence regarding factors that bring on SIDS is limited, leaving families caregivers and healthcare providers mystified. They are left with little or no awareness of opportunities to prevent SIDS and in many cases, they often blame themselves in the absence of clear, causal or contributing reasons.

Sudden Unexpected Infant Death (SUID), first identified in 1992 (“Data and Statistics,” n.d.) is defined as: the sudden death of an infant whose cause may be due to natural or unnatural reasons and is undetermined prior to an investigation and not obvious at the time of death. However, after a comprehensive postmortem inquiry, many of these deaths can be attributed to accidental strangulation and suffocation in addition to an unknown cause or SIDS (“Sudden Unexpected Infant,” n.d.). By the year 1996, the Centers for Disease Control (CDC) released the Sudden Unexplained Infant Death Investigation reporting forms. The cause of death was defined using the following ICD-9 and ICD-10 codes: ASSB (E913.0; W75), SIDS
(798.0; R95), and unknown cause, (799.9; R99) based on the underlying cause of death (“Data and Statistics,” n.d.).

It is important to understand that while there is a distinction between SIDS and SUID, the acronyms used to describe infant deaths overlap, are confusing, and many deaths that were initially labeled as SIDS are now being classified as SUIDs (Stokowski, 2016). In 2014, the CDC reported that approximately 3,500 infants die annually from SUIDs in the United States (“Data and Statistics,” 2016). SUIDs is the leading cause of death in infants from birth up to age one (“Data and Statistics,” 2016). Extensive research has yielded evidence that most SUID deaths are attributed to factors that include entrapment, asphyxia, suffocation, and infection (“SIDS and Other,” 2011). Recent findings also point to evidence of a higher risk for SUIDs as a consequence of bed sharing, placing a baby prone (on their stomach) to sleep, soft bedding, bumpers, a cluttered crib, parental smoking, parental use of illicit drugs, and the abuse of alcohol (Horne, Hauck, & Moon, 2015). These risks are generally categorized as unsafe sleeping practices.

Healthcare providers have an obligation to provide guidance and education to parents and caregivers regarding the importance of safe sleep practices. Equally crucial is how to relay the information so that everyone fully comprehends the ease of infant suffocation in unsafe sleep environments. The knowledge level and beliefs of healthcare providers regarding safe sleep messaging can play an instrumental role in the reduction of SUIDs, especially because there are still communities not receiving this message. Moreover, there are no mandatory standardized guidelines for healthcare providers to adhere to when pertaining to SUID prevention. By understanding the relationship between factors that may leave infants especially vulnerable to SUIDs, including living in poverty, infections, unsafe sleep positions
and underdeveloped anatomy, more healthcare providers may be likely to incorporate safe
sleep messaging for parents and caregivers into routine infant visits (Cohen-Spira et al., 2014).

**Statement of Problem**

In 1944, Dr. Abramson, a renowned pathologist who practiced in New York, observed
that two-thirds of infant deaths were from mechanical suffocation; that is, the loss of the ability
to breathe due to strangulation, or smothering by bed clothes, plastic bags or similar materials
(Gilbert, Salanti, Harden, & See, 2005). Dr. Abramson discovered that infants who died from
mechanical suffocation were found lying in the prone position (Gilbert et al., 2005). At
approximately the same time, researchers in Holland, Australia and the United Kingdom
reported comparable findings. Following these reports from multiple countries, a health
promotion crusade was initiated to promote placing infants in the supine position to sleep.
Physicians ignored the recommendations and researchers continued to draw alternative
conclusions with respect to the reasons that seemingly healthy babies were dying (Gilbert et
al., 2005).

In 1992, Warren Guntheroth and Philip Spiers published findings from studies of infant
deaths in seven countries. The synthesis of findings, published in *The Journal of the American
Medical Association* (JAMA), presented recommendations for the termination of the prone
sleeping position in infants (Guntheroth & Spiers, 2005). In the same year, Gilbert et al
published a systematic review and meta-analysis on the influence of placing an infant prone
(on the front) and on his or her side, in relation to the risk of SUID (Gilbert et al., 2005).
These researchers reviewed and integrated literature that included recommendations on how to
place a baby to sleep, utilizing articles published between 1940 and 2002.

Even though the safest position, to place infants on their back, was known, it was only
mentioned briefly in the literature at irregular intervals during the 1980s and not recommended routinely until 1995. The reasons that some clinicians continued to advocate for front sleeping during the period of 1940-1995 remain ambiguous. However, a lack of inquiry concerning infant safe sleep positions highly correlates to the amount of infant deaths during that time. From 1974 until 1991, 50,000 excess deaths attributed to unsafe sleep advice took place in the USA, Europe, and Australia, and the USA had the highest rate of front sleeping compared to any other nation (Gilbert, et al., 2005).

It wasn’t until the year 1992 that Sudden Unexpected Infant Death (SUID) and issues concerning sleep positions were first noted in an American medical publication. In that same year, The American Academy of Pediatrics (AAP) published its first recommendation for physicians to advocate infants be situated on their back to sleep ("SIDS and Other," 2011). Finally, in 1994, a “Back to Sleep” campaign commenced to educate parents about the new recommendation to place infants in a supine sleeping position (“Explore the Campaign,” 2011). After “Back to Sleep” campaigns were introduced in 1994, front sleeping was avoided, and the decline of infant deaths was immediate (“Policy Statement,” n.d.). In countries that adhered to the recommendation that infants be placed on their “back to sleep,” reported infant deaths fell 50-70% (Gilbert et al., 2005).

Despite the early success of the Back to Sleep Campaign, the number of infants being placed to sleep in a supine position reached a plateau in 2001 (Colson et al., 2009). Research from data collected during 2005–2008 showed that of 3,136 infant deaths resulting from SUID, only one-quarter of infants were lying on their backs when they were found; approximately 70% were on a surface not designed for infant sleep, such as an adult bed, and 64% of infants were co-sleeping (Schnitzer et al., 2011). In 2011, the AAP safe sleep
guidelines expanded to concentrate more on safe sleep environments. These recommendations included the avoidance of all soft bedding, overheating, alcohol, and tobacco use, as well as using a firm sleep surface and breastfeeding ("SIDS and Other," 2011) (see table 3). On October 24, 2016, the AAP announced its latest safe sleep recommendations to prevent sleep-related infant deaths. The AAP is now recommending that infants sleep in the same room, up until at least six months, but preferably until age one, with their parents or caregivers.

While the AAP does not recommend bed sharing, it offers advice to women who breastfeed on how to ensure that the bed is as safe as possible if the mother should fall asleep while feeding their infant ("SIDS and Other," 2016). The AAP recommends that, if an infant is taken to the bed for breastfeeding, the parent should make sure to stay awake and immediately place the infant in his or her own safe sleep space when feeding is completed. Couches and chairs are especially hazardous and parents should make sure not to fall asleep while breastfeeding on these surfaces or the infant could become wedged between cushions. Even though it may be less dangerous to fall asleep with an infant in the parental bed than on a couch, parents and caregivers should assure the bed is firm and void of cushions or blankets. The AAP also recommends that as soon as the parent or caregiver wakes, he or she should return the infant to his or her own sleep surface ("SIDS and Other," 2016) (see table 4).

Epidemiologists have also identified environmental risk factors that elevate the risk of SUIDs, attributing a large percentage of these deaths to several unsafe sleeping conditions (Senter, L., Sackoff, J., Landi, K., & Boyd, L, 2011). In 2013, Deanne Tilton Durfee, executive director of the Inter-Agency Council on Child Abuse and Neglect, observed that infants under the age of one are at greatest risk of suffocation because their bodies are still
developing (Durfee, 2013). It is dangerous for parents to sleep with their newborn children due to the infant’s fragile physiology and inability to move with force. A study published in Pediatrics in July, 2014, analyzing data concerning 8,207 infant deaths from 24 states occurring between the years 2004 and 2012, found that almost 74 percent of deaths in infants younger than four months old occurred because of co-sleeping (Carroll, 2014). Because of the dangers of co-sleeping, healthcare providers should be required to provide direction to parents and caregivers concerning the risks associated with co-sleeping (Davis, Parker, and Montgomery, 2004).

In 2004, the New York City Office of Chief Medical Examiners launched a program to train medico-legal investigators (MLI) to implement doll re-enactments in SUID scene investigations, leading to increased accuracy in concluding the cause and manner of death in these cases (Senter et al., 2011). Following this change, death certificates noting Sudden Infant Death Syndrome (SIDS) as the cause of death have declined and at the same time increases in SUIDs have ensued (Senter et al., 2011). A retrospective analysis of 363 sleep-related infant deaths by Regensburg, conducted during 2005-2012, at the Sudden Infant Child Death (SICD) Resource Center in New York City, revealed that the highest number of sleep-related deaths occurred in infants 29 to 83 days old. Findings also showed that an infant’s developmental milestone of steadily lifting the head 45 degrees does not stabilize until 84 days, leaving them especially vulnerable to asphyxia in the prone position, because they are unable to reposition themselves when they are face down (Hagan, Shaw, Duncan, 2007).

Research findings also indicate that infants are primarily obligate nose breathers, meaning they have a propensity to breathe through their noses (Chirico & Beccagutti, 2010). The oral airway of an infant is comparatively smaller than that of an adult and an
infant’s tongue is relatively larger, resulting in increased oral airway resistance (Chirico & Beccagutti, 2010). The consequences of nasal congestion can lead to infection, a disrupted sleep cycle, sleep apnea, and even respiratory distress (Chirico & Beccagutti, 2010). Significant data also suggests that respiratory viruses are present in the beginning of the SUID syndrome (Harris et al., 2012).

A joint investigation between the Iowa Department of Public Health and the Iowa Office of the State Medical Examiner (IOSME) was conducted following a sudden rise in infant deaths during the winter of 2008 (Harris et al., 2012). This investigation required the participation of multiple medical examiners from several jurisdictions. Early on in the inquiry, respiratory viral infections were considered as being the source. The clinical presentations were similar in that they all suffered from a respiratory illness. In the study, public health and medical examiners concluded that 15 of the 22 infant deaths were recognized as SUIDs and as having pathogenic causes.

The cultures obtained from seven of these decedents tested positive for Respiratory Syncytial Virus (RSV), affirming the conclusion that infectious disease played a major role (Harris et al., 2012). The researchers emphasized the importance of collaboration amongst medical examiners, health care providers, policy makers, and the community-at-large when gathering evidence that suggests there may be additional factors contributing to these preventable infant deaths. Furthermore, the relationship between public health professionals and forensic scientists is quintessential in order to target causal relationships in SUIDs in a timely manner (Harris et al., 2012).

The 2016 updated safe sleep guidelines issued by the AAP stress that keeping the airway patent is the most critical factor to eliminate suffocation (“SIDS and Other,” 2016).
The fact that nasal congestion can lead to airway obstruction needs to be further explored. In the last twenty years, studies have proposed theories to explain the phenomenon of viral infections and their relation to SUIDs, but the literature to date has not yet drawn conclusions with regard to its impact on these infant deaths. Studies have demonstrated how easy it is for a baby to suffocate and this may be the single most important piece of information to convey to expectant mothers, fathers, caregivers, and health professionals (Cohen-Spira et al., 2014).

Back to Sleep campaigns educate the public on how to place an infant to sleep but they fall short in getting the message through to parents and caregivers on how vulnerable infants are due to their immature musculature and propensity for infections. Healthcare providers have a duty to inform and educate parents and caregivers at each infant visit. In addition to the dangers of co-sleeping and placing and infant on their front to sleep, other risk factors must be considered when developing safe sleep training. It is essential that guidelines include how to care for an infant holistically so parents understand how anatomy plays a crucial role in why correct positioning can prevent suffocation and ultimately reduce SUIDs.

**Significance of the Problem**

Although there have been many strategies to educate the public on safe sleep practices, the incidence of Sudden Unexpected Infant Deaths (SUIDs) has been relatively unchanged for over two decades. Furthermore, research demonstrated that these deaths mostly occur in medically underserved communities (Cohen-Spira et al., 2014). Between the years 2004 and 2011, in New York City, the majority of infant injury deaths were sleep-related (Cohen-Spira et al., 2014). Infants between eight to sixteen weeks residing in poverty-stressed neighborhoods have the highest risk of SUIDs and in 2014, Brooklyn held the highest rate of infant deaths from SUIDs (Cohen-Spira et al., 2014).
The number of homeless people nationwide is on the rise. In New York City alone, the shelter system population increased by 7% from 50,135 in January 2013 to 53,615 one year later, the highest level ever recorded (Cohen-Spira et al., 2014). The fact that an average of one baby dies every week in New York City from these preventable deaths warranted an immediate resolution. In 2010, the New York City Department of Homeless Services (DHS) experienced four infant deaths within two months in its shelter system. These four infants died in unsafe sleep environments (Gambatese et al., 2013).

Mulvanerty participated in the task force convened by the DHS Medical Director, which devised and implemented a joint training entitled "Keeping Your Baby Safe," for 445 family shelter case managers in spring 2011. This training utilized doll reenactments in unsafe sleeping positions, guidelines from the AAP and how to care for an infant with symptoms of a cold (Gambatese, et al., 2013). Before this training, up to six sleep-related infant deaths were reported annually in the shelter system. Surveillance information collected after the training showed only one sleep-related infant death occurred early in the following year and none during the second year subsequent to the training (Gambatese, et al., 2013).

Research has demonstrated the considerable influence health care professionals have on safe sleep messaging (Gelfer, Cameron, Masters & Kennedy, 2013). Healthcare providers can initiate and continue safe sleep conversations while educating infant caregivers, influencing them to practice safe sleep with their infants. The AAP recommends routine visits for infants at months one, two, four, six, nine, and one year, thus providing most health educators ample opportunity to teach and reinforce the safe sleep message with families. Additionally, the recommended schedule for visits to an Obstetrician/Midwife for a healthy pregnancy is up to nine visits in nine months (Johnson, 2016). However, health care providers are not routinely
delivering the safe sleep message, and some feel it is not their duty to do so, leaving new parents and caregivers misinformed (Lindeman, 2016).

Organizational Needs Assessment

A gap in the literature exists on safe sleep data with the Orthodox Jewish community since 2004, making it the only MUA in New York City without full access to this information. Hasidic Jewish individuals, a devoutly religious Orthodox sect, separate themselves from the non-religious world by creating cultural boundaries that can place limits on the work of healthcare providers (Coleman-Brueckheimer & Dein, 2011). Nurses and health educators face numerous practice challenges, including engaging Hasidic families in learning and practicing infant safe sleep. The clinical research site chosen for this pilot study is located at a primary care healthcare network in a highly populated, MUA in Brooklyn, New York.

This organization was the first community-based establishment to provide social services in the area that focused on Orthodox Jewish families (CEO, personal communication, October 15, 2014). In 2015, this network documented over 200,000 visits (CEO, personal communication, April 10, 2016). This neighborhood has some of the highest fertility rates in the borough (“New York City,” 2014). Brooklyn has the largest percentage of children compared with other counties in New York City (“The Jewish Community Study,” 2011).

Furthermore, Brooklyn has one of the most diverse populations in all of the United States: during the period 2007-2009, 36.8 percent of the population was white; 19.5 percent was Latino; 32.7 percent was black; and 9.4 percent was Asian (“Demographics,” 2012). Yiddish is the historical language of Jewish individuals, predominately Ashkenazic Jews of Central and Eastern Europe (“Yiddish,” n.d.). The population served by the facility at which the study was conducted are primarily Jewish. This, coupled with varying cultural beliefs,
creates divides when concerning patient and healthcare provider communication.

The Joint Commission coined the term “triple threat” to describe diminished health literacy, limited English language proficiency, and cultural barriers as impeding on effective healthcare (Singleton & Krause, 2009). 3.7 percent of all individuals living in Brooklyn speak Yiddish (“Demographics,” 2012). Additionally, as stated in the “Jewish Community Study of New York: 2011 Geographic Profile,” 22 percent of all Brooklyn households are Jewish, and 36 percent of all people in living Williamsburg are Jewish (“Jewish Community Study,” 2011).

Jewish individuals exist at nearly double the overall rate of other populations in the Williamsburg section of Brooklyn. The Orthodox birthrate in the United States (U.S.) is far higher (at 4.1 per adult) than the U.S. overall average of 2.2 children per family (Nathan-Kazis, 2013). Research has shown the compliance of Jewish parents with safe sleep recommendations grows negatively in relation to the religiosity of the caregivers (Sivan et al., 2004). However, infants in this Jewish community are rarely autopsied due to religious objections, making it difficult to survey the incidence of unsafe sleep deaths according to the existing medical definition.

Research Questions/Aims

1. What level of knowledge do healthcare providers have regarding best practice for Safe Sleep of infants?

2. What are healthcare provider beliefs towards SUIDs prevention strategies?

3. What are the gaps in knowledge and barriers that exist in preventing SUIDS in their current practice?
Purpose of the Study

The purpose of this study was to examine the changeability of an online educational intervention on healthcare providers’ knowledge level and self-reported behavioral intent to educate parents and caregivers on the importance of safe sleep practices.

Theoretical Framework/EBP Model of Implementation

Permission was granted to use *The Iowa Model of Evidence-Based Practice to Promote Quality Care and Implementation Guide* (Titler et al., 2001). The Iowa model emphasizes organization and collaboration, integration of conduct, and the use of research, along with other forms of evidence. It encourages the researcher to identify a clinical problem prior to investigating current practices and standards (Melnyk & Fineout-Overholt, 2015). Knowledge of best evidence must guide clinical practice to improve patient outcomes.

The Iowa Model of EBP uses holistic methods to target clinical issues and discover the procedures to investigate them extensively. Marita G. Titler, Ph.D., RN, FAAN, developed the model, intending to use it as a means of transforming knowledge and research and encouraging its use by healthcare providers (Titler et al., 2001). The Iowa model considers the entire healthcare system, including practitioners, patients, and organizations and includes problem- focused and knowledge-focused triggers related to behavior and practice change in the system. The investigator must first recognize the problem, afterwards marking it as significant. When the evidence affecting healthcare is identified, providers can apply their knowledge, including for example, carrying out evidence-based patient education.

A new practice guideline, such as an education module, can become a knowledge- focused trigger to explore the ways in which healthcare practitioners, and then patients, are motivated to change. These triggers encompass new research or other
literature, national agencies, or organizational standards and guidelines, philosophies of care, and questions from institutional standards committee (Titler et al., 2001). When the issue becomes a priority for the organization, a team is formed, research and literature are reviewed, critiqued and synthesized for use in practice (Titler et al., 2001).

Once the team determines that the research supports the validity of evidence related to approaches to addressing the healthcare concern, the team designs an intervention to make a change in the practice. The intervention to improve practice focuses on goals including data collection, developing an evidence-based practice, process and outcomes evaluations, and modifications to practice guidelines. Ultimately, when the team decides the change is instrumental to best practice, they monitor the practice structure, collect and analyze process and outcome data, evaluating everything from the environment, to the staff, patients, and costs (Titler et al., 2001).
Chapter 2 – Review of the Literature

A review of the current literature for guidelines intended for healthcare providers on how to influence parents and caregivers to deliver safe sleep messaging served as the starting point of this pilot study. Several factors were examined in order to provide a comprehensive approach to deliver an on-line education module to assess the current knowledge level and beliefs of healthcare providers concerning safe sleep messaging. In critically appraising the literature, there was no research to date that explicitly adapted the 2011 AAP safe sleep guidelines from the standpoint of identifying knowledge, and beliefs of any healthcare providers. The current state of evidence demonstrated that research performed regarding safe sleep practices was predominately conducted with physicians, and there was nothing in the literature that examined the knowledge and beliefs of APNs. APNs are at the forefront of primary care rendering tending to infants. Assessing their knowledge level and beliefs regarding the prevalence of SIDS and safe sleep practices was important in order to gain an understanding of what the gaps are so that all healthcare providers deliver this message.

Introduction to Search Criteria

MeSH search terms were combined as follows: death, sudden infant or suffocation, “crib death,” health knowledge, “belief of health care providers,” positional asphyxia, SIDS, SUIDS or Sudden Unexpected Infant Death Syndrome, SUD or Sudden Unexpected Death, nasal congestion, stuffy noise, respiratory infections, baby, common cold, newborn, nasal obstruction, rhino virus, obligate breather, and respiratory syncytial viruses. Inclusion criteria included: English.
Critique and Synthesis of Previous Evidence

While analyzing the literature, there were no specific articles that spoke of ways in which AAP safe sleep guidelines were being implemented amongst health care providers in a MUA from the perspective of an increase in knowledge or a change in beliefs. EMBASE, MEDLINE/PubMed, CINAHL, ERIC and Gray Literature searches yielded zero results for searches that included any combination of the terms: SIDS, nasal congestion, unsafe sleep, and infant deaths. A search for infant mortality and colds produced one article, and that was excluded.

A search for published literature related to infant mortality and colds combined resulted in twenty-four articles, respectively. Duplicate studies were omitted. A search on ProQuest Health Management for “Jewish children and safe sleep” yielded no results. A search for “Jewish children and SIDS” on ProQuest Health and Medicine yielded no results. A search for “Jewish children and pediatrics and safe sleep” on ProQuest Health and Medicine yielded forty-two articles, of which one focused on safe sleep. An additional hand search was done from references within the identified articles. A little over 400 abstracts were reviewed. Seven studies, two integrative reviews, and one systematic literature review were systematically reviewed.

A search for safe sleep programs across the country revealed there are many initiatives being implemented to educate the public on safe sleep practices. At the state level in Michigan, Governor Rick Snyder signed new legislation intended to safeguard their most defenseless children (http://www.congress.gov, n.d.). At the Federal level, the Child Care Infant Mortality Act is Senate Bill (S1494) was presented on 9/11/2013 by (California Senator) Diane Feinstein and referred to the committee onHealth, Education, Labor and Pensions
(“S.1494 – Child Infant,” 2013). It requires health and safety training for child care providers and is mandatory under state and local law. It is certified by the state plan to include training on cardiopulmonary resuscitation, first aid, and safe sleep practices that also address SUIDs prevention education.

Rep. McAsey, sponsored the Illinois state legislation that passed a house committee on March 3, 2011 (Maruyama, 2011). House Bill (HB) 5930 mandates hospitals to provide free education and resources to parents or legal guardians regarding (SUIDs) upon discharge from the hospital. Hospital staff is obligated to review the materials with patients before they are discharged. Many infants have died in the care of a non-parental caregiver. HB 2099 amends section 7 of the Child Care Act of 1969 (225 ILCS10/) to require all licensed child care facility employees to complete SUIDs training every three years.

In 2015 the New York City Public Health Council Initiative set aside a budget of 2.5 million dollars, with a city tax levy of 2.5 million dollars matched by the state to address infant mortality reduction. “New York Public Health Law 2500-b directs the commissioner to establish a program to study SUIDs, which may consist of pilot projects. Such projects include epidemiological investigation, family counseling and evaluation in order to identify the major risk factors in sudden infant deaths with the objective of preventing such deaths (www.health.ny.gov).” Furthermore, “New York Public Health Law 4210 directs the commissioner to adopt regulations to establish standard autopsy protocols for any person under the age of one year who dies under circumstances in which death is not anticipated by medical history or the cause is unknown. In developing and implementing these protocols, the commissioner shall consult with a pediatrician with expertise in SUIDs and the Sudden Infant Death Syndrome Program.”
The scientific rigor of the individual published research studies was graded by the researcher following guidelines from the Agency for Healthcare Research and Quality (AHRQ) (AHRQ, 2002). These guidelines used three domains to evaluate the evidence: a) quality: the extent to which the researchers minimized selection and measurement bias (internal validity); b) quantity: the number of studies that evaluate the clinical issue, sample size or power, and extent of treatment effect; and c) consistency: determining if the different studies report similar findings.

Evidence hierarchies rank types of evidence according to their strength. A table was ranked using a seven-level hierarchy. The summary table revealed that the strength of evidence was Level II, IV, & VI. The literature on this subject is sparse. Randomized controlled trials and Level I studies concerning SIDS are difficult to find. Other limitations include:

- All but one had very small sample sizes;
- Criteria for SIDS and SUIDs certification varies across jurisdictions;
- Telephone survey study reached skewed population that changed demographically over the time of the study;
- Self-report, self-select, dependent on memory, respondent bias;
- Remaining surveys subject to respondent bias, interviewer bias, selection bias;
- Most studies are correlative, not causative.

Strength of Recommendation Taxonomy (SORT) was used to assess strength of evidence; strong recommendations are centered on Level I studies and have specific criteria presented in tabular form. The criteria are used to determine whether studies are of good or poor quality; these are also useful in verifying whether studies are consistent amongst one another. The
research relating to SUIDs is rated C, meaning that the recommendation is built upon consensus, usual practice, opinion, and disease-oriented evidence (Ebell et al., 2004).

**Rationale for Project**

Mulvanerty was inspired to embark on this pilot study after working as a family nurse practitioner in a MUA in Brooklyn, New York. A large percentage of the families served within this MUA are Orthodox Jews. These families are isolated from the general public and are not exposed to public campaigns. Many families were arriving with their infants in carriages and strollers, face down, and on a pillow. Also, many infants arriving for routine and urgent care visits had nasal congestion. When the O\textsubscript{2} saturations were measured in these infants with nasal congestion, it was often between 90-95%, which is below normal and cause for concern and medical treatment. The common cold is the prevailing diagnosis for doctor visits each year ("Upper Respiratory Infections," n.d.). Most upper respiratory infections resolve on their own and do not require antibiotics but close observation is warranted ("Upper Respiratory Infections," n.d.). Because frequent visits occur in the first year of life, parents and caregivers might be able to make a connection between maintaining a patent airway, when their infant is experiencing cold-like symptoms.

Mulvanerty was compelled to ensure that families and caregivers who are served by the facility in which the study was conducted were receiving the safe sleep message. This Orthodox community is located adjacent to the neighborhood with the highest prevalence of SUIDs in the borough, and may be at high risk as well. A learning module was tailored to incorporate recommendations issued by the AAP and from the “Keeping Your Baby Safe” initiative at the New York City Department of Homeless Services that included how to care
for an infant with cold-like symptoms. Developmental milestones, New York City SUIDs statistics, and safe sleep practices for breastfeeding were also part of this educational training.
Chapter 3 – Methods

Study Design

The proposed research study used a single group pre-test/post-test design to examine the effect of a nurse-led educational program delivered online regarding health care providers' knowledge level and beliefs. The pre-test/post-test and educational program was presented by the Principal Investigator (PI). The clinical research site is located in Brooklyn, New York. IRB approval. The study was approved by two Institutional Review Boards: Georgetown University, from which approval was obtained on 4/7/2016, and from the facility at which the research was conducted, from which approval was obtained on 8/12/2016.

Procedures – Sampling Plan

The sample design used was a non-probability, non-random convenience sample taken from a group of healthcare providers including Pediatricians, Family Practitioners, Midwives, Obstetrics and Gynecologists (OB/GYN’s), NP Students, Physician Assistants (PAs), students and Registered Nurses (RNs). There are approximately 55 providers in total. The inclusion and exclusion criteria used were:

Inclusion criteria

i. ≥18 years of age

ii. Ability to speak and read English

iii. Healthcare providers
**Exclusion criteria**

iv. <18 yrs.

v. Not able to speak or read English

vi. Unable to understand and give informed consent

**Educational Module**

The educational module that served as the intervention for this scholarly project was based on a successful training on safe sleep guidance for the New York City Department of Homeless Services and developed after a rigorous literature review to examine other factors that influence SUID.

**Sample Recruitment**

A meeting with the Medical Director where the study took place was conducted in the fall of 2014 to discuss the possibility of performing a pilot study on safe sleep practices. Follow-up sessions were held with the Medical Director and Compliance Officer to keep them informed of the progress of the research. An email was delivered by the Medical Director 55 eligible participants describing the study and to encourage them to participate. All participants were made aware that no identifying information would be collected and that this study was entirely voluntary. Of the 55, 37 attempted to partake in the study, but ultimately 23 completed the entire module. The CEO agreed to allow each provider to block his/her schedule for 30 minutes to complete the study. The study included a pre-test, educational program and post-test. Survey Monkey® (Ebersman, 2016) was used for the pre-test and post-tests and to deliver the educational program.

All healthcare providers at the network were approached in person or by phone by the researcher, who explained the study and read the informed consent script. The eligible
participants were reminded that all information from data collected would remain anonymous
with no personalized link to participants. Each individual signed the informed consent when
they agreed to participate. The informed consent script also was embedded in the Survey
Monkey® survey. Respondents were also informed that the names of the participants would
not be published. All data were collected over a password protected, secure channel and stored
on a secure server. The anonymous data were shared with the statistician and the researcher’s
mentors at Georgetown University.

**Intervention**

The researcher used Survey Monkey® to deliver the both the education module and
the pre- and post Safe Sleep Survey entirely online. The first page provided a description of
the study and the online consent script requesting the participant’s agreement to participate.
The pre-intervention assessment included sociodemographic information--race, gender,
ethnicity and level of education as well as questions about SUIDs, including the prevalence
and age of when most of these deaths occur. It also included questions related to whether or
not the HCPs queried parents and caregivers where their infant slept or if they had a crib. A
Power Point presentation was then viewed by the participants. Then a post-test designed to
ascertain if there was an increase in knowledge or change in beliefs with regard to the
delivery safe sleep education was delivered through Survey Monkey. The participants
completed the pre-assessment, the educational intervention, and the post-assessment, in one
sitting.

The nurse-led education module provided current guidelines that offered practical
suggestions regarding approaches to incorporating the safe sleep message into routine and sick
visits as anticipatory guidance to parents or caregivers. It prompted health care providers to
have conversations about how to keep babies safe and offered parents suggestions about how to care for healthy infants. For example: where to breast feed, and how to care for infants with a cold. The pre-test, post-test, and education modules were developed with the guidance of nationally renowned safe sleep expert, Margaret Regensburg, Ph.D., LMSW, Program Director at the Sudden Infant and Child Death (SICD) Resource Center – New York City Regional Center. Dr. Regensburg provided leadership in the field of sleep-related infant mortality education and infant sleep safety awareness in the New York City area.

**Data Collection**

Once the participants signed the informed consent, the study was made available online via a link that was sent via a secure email to each participant. All data was stored on this PI’s password protected, secured personal laptop. No identifiers were used and all data was protected with file encryption. The study was open for an accrual period of three weeks from July 12, 2016 – August 2, 2016. The data collection phase took place over a one-month period. Sociodemographic information was collected at the beginning of the survey and included questions related to: gender, ethnicity, race, religion, level of education, and how many patients are seen on average each day.

The pre-assessment form comprised of 16 questions encompassing five categories of questions, including: knowledge related to prevalence of SUIDs, at what age does SUIDs most occur, which borough in New York City had the highest number of infant deaths related to SUIDs, infant anatomy, do they discuss safe sleep, do they believe it is important to discuss safe sleep. The post-assessment form comprised six categories of questions, including the exact questions in the pre-assessment form and in addition; three questions at the end were added that asked if they gained knowledge from this educational intervention, did they learn
more about SUIDs, and will they now be more likely to discuss safe sleep with their patient population after participating in this study.

Prior to data analysis, all appropriate data checks of test assumptions (e.g., multicollinearity, homoscedasticity, normality, undue influence of outlier scores) were examined. Missing data were treated based on the amount of missing data, as well as any patterns evidenced by missing data values. The psychometric properties (e.g., internal consistency via the Cronbach’s alpha) were assessed for the study instruments.

**Data Analysis**

Data analysis, using IBM SPSS Statistics Version 24 was conducted in three phases. First, all study variables were presented descriptively, including mean and standard deviation scores for continuous variables and frequency counts and percentages for categorical variables. Next, change scores were computed for use in bivariate analysis where dependent variable pre-test scores are subtracted from post-tests scores to reflect the degree of change in the dependent variables from pre-test to post-test. Bivariate tests, e.g., paired samples *t*-tests, Pearson *r* correlations, One-Way ANOVA, Chi-square) was used to determine which predictor variables (both covariate and independent variables) evidenced a statistically significant relationship with the changes in the dependent variable scores from pre-test to post-test. All predictor variables that evidenced a statistically significant relationship with a respective dependent variable were included in the multivariate analysis for that dependent variable. Third, a repeated measure GLM was used to test if there was a significant increase in pre-test to post-test scores regarding each dependent variable, while controlling for significant predictors (p<.05 at the bivariate level) that impacted each respective outcome.
Chapter 4 – Evaluation of Results

Demographics

Table 1 presents the demographic characteristics of the participants in the current study. Data indicated that the sample was evenly divided among female \(n=11; 47.8\%\) and male \(n=12; 52.2\%\). Over three-quarters of the sample self-identified as White \(n=20; 87.0\%\); a small percentage was of Hispanic or Latino ethnicity \(n=1; 4.3\%\). A majority of the sample \(n=19; 82.6\%\) self-identified as of Jewish religious affiliation. In addition, a majority \(n=21; 91.3\) reported being board certified in their occupation.
Table 1

Sample Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>47.8</td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>52.2</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>22</td>
<td>95.7</td>
</tr>
<tr>
<td><strong>Racial Identity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>20</td>
<td>87.0</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jewish</td>
<td>19</td>
<td>82.6</td>
</tr>
<tr>
<td>Unaffiliated</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Christian</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Buddhist</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Are you board certified in this occupation?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>91.3</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>8.7</td>
</tr>
</tbody>
</table>
Table 1 (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you learned more about SUIDs from this education program that you knew before the program?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19</td>
<td>82.6</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>13.0</td>
</tr>
<tr>
<td>Not Sure</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Have you learned more about safe sleep messaging from this education program than you knew before the program?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19</td>
<td>82.6</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>17.4</td>
</tr>
<tr>
<td>Do you believe that you will discuss safe sleep more with your patient population after participating in this education program?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>87.0</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>Not Sure</td>
<td>1</td>
<td>4.3</td>
</tr>
</tbody>
</table>
Comparison of Pre-test/Post-test Results

Table 2 presents the percentage of correct/preferred responses at pre-test and post-test per individual item, as well as by the 13-item composite overall Score. In terms of individual items, statistically significant changes were seen from pre-test to post-test for the items: “Approximately how many infants die from SUIDs in New York City each year?” (21.7%, $SD=.42$ vs. 47.8%, $SD=.51$, respectively, $p<.05$), “Do you know which borough had the highest rate of SUIDs in 2014?” (13.0%, $SD=.34$, vs. 73.9%, $SD=.45$, respectively, $p<.001$), “How many weeks from birth does it generally take for an infant to hold her/his head up on their own and turn her/his head from side to side?” (26.1%, $SD=.45$, vs. 60.9%, $SD=.50$, respectively, $p<.01$), “How important is it to ask parents in your practice if their infant sleeps in a crib?” (34.8%, $SD=.49$, vs. 73.9%, $SD=.45$, respectively, $p<.001$), “Approximately how many infants die from Sudden Unexpected Infant Death (SUIDs) in the United States every year?” (43.5%, $SD=.51$, vs. 82.6%, $SD=.39$, respectively, $p<.001$), and “How important is it to measure the Oxygen Saturation rate of an infant who presents with cold like symptoms?” (26.1%, $SD=.45$, vs. 56.5%, $SD=.51$, respectively, $p<.01$). Lastly, analysis indicated a statistically significant change in the overall 13-item composite score from pre-test ($M=6.13$, $SD=2.78$) to post-test ($M=8.78$, $SD=3.79$) at the $p<.001$ level. This finding is also presented in graph form within Figure 1.
Table 2

Percentage of Correct/Preferred Responses at Pre-test/Post-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest Mean (SD)</th>
<th>Post-test Mean (SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>How important is it incorporate the safe sleep message when discussing breastfeeding?</td>
<td>52.2 (.51)</td>
<td>60.9 (.50)</td>
<td>.33</td>
</tr>
<tr>
<td>Approximately how many infants die from SUIDs in New York City each year?</td>
<td>21.7 (.42)</td>
<td>47.8 (.51)</td>
<td>.03</td>
</tr>
<tr>
<td>Do you believe health care providers have a considerable influence on safe sleep messaging?</td>
<td>78.3 (.42)</td>
<td>87.0 (.34)</td>
<td>.33</td>
</tr>
<tr>
<td>Would you engage a member of your religious affiliation to educate mothers and caregivers on the importance of the infant safe sleep message?</td>
<td>73.9 (.45)</td>
<td>78.3 (.42)</td>
<td>.58</td>
</tr>
<tr>
<td>Do you know which borough had the highest rate of SUIDs in 2014?</td>
<td>13.0 (.34)</td>
<td>73.9 (.45)</td>
<td>.001</td>
</tr>
<tr>
<td>At what age do infants start routinely breathing through their mouth?</td>
<td>26.1 (.45)</td>
<td>21.7 (.42)</td>
<td>.71</td>
</tr>
<tr>
<td>How many weeks from birth does it generally take for an infant to hold her/hers head up on their own and turn her/his head from side to side?</td>
<td>26.1 (.45)</td>
<td>60.9 (.50)</td>
<td>.002</td>
</tr>
</tbody>
</table>
How important is it to demonstrate to parents and caregivers how to administer nasal saline drops and how to aspirate mucous from the nose when infants present cold like symptoms?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest Mean (SD)</th>
<th>Post-test Mean (SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>How important is it to discuss safe sleep practices at each newborn and infant visit?</td>
<td>60.9 (.50)</td>
<td>69.6 (.47)</td>
<td>.33</td>
</tr>
<tr>
<td>How important is it to ask parents in your practice if their infant sleeps in a crib?</td>
<td>34.8 (.49)</td>
<td>73.9 (.45)</td>
<td>.001</td>
</tr>
<tr>
<td>Approximately how many infants die from Sudden Unexpected Infant Death (SUID) in the United States (U.S.) every year?</td>
<td>43.5 (.51)</td>
<td>82.6 (.39)</td>
<td>.001</td>
</tr>
<tr>
<td>Variable</td>
<td>Pretest Mean (SD)</td>
<td>Post-test Mean (SD)</td>
<td>p</td>
</tr>
<tr>
<td>How important is it to measure the Oxygen Saturation rate of an infant who presents with cold like symptoms?</td>
<td>26.1 (.45)</td>
<td>56.5 (.51)</td>
<td>.005</td>
</tr>
<tr>
<td>Overall 13-Item Composite Score (# Correct)</td>
<td>6.13 (2.78)</td>
<td>8.78 (3.79)</td>
<td>.001</td>
</tr>
</tbody>
</table>
Chapter 5 – Discussion of Findings

Final analysis, using a repeated measures general linear model was carried out on data from the twenty-three participants who returned completed pre- and post-class surveys. There was a statistically significant change in the overall 13-item composite score reflecting knowledge level and change the self-reported behavioral intent from pre-test (M=6.13, SD=2.78) to post-test (M=8.78, SD=3.79) at the p < .001 level.

This study demonstrated that the educational intervention resulted in improvements in the knowledge and self-reported practices and positive behavioral intent. At the conclusion of the program, 19 (82.6%) study participants responded “Yes” to the questions “Have you learned more about SUIDs from this education program that you knew before the program?” and “Have you learned more about safe sleep messaging from this education program than you knew before the program?” Lastly, 20 (87.0%) study participants responded “Yes” to the item “Do you believe that you will discuss safe sleep more with your patient population after participating in this education program?”

In order to help ensure that healthcare providers are accurately informing parents of appropriate infant sleep practices, this doctoral project used an evidence-based educational intervention to increase the knowledge level and change the beliefs of healthcare providers who work in a health facility in a MUA in Brooklyn, New York. The findings revealed:

- a gap in knowledge among the participating healthcare providers, who serve parents in the health facility in which the study was conducted;
- a brief educational intervention can improve providers’ knowledge and their self-reported behavioral intent;
• in this case, they will now include education regarding infant sleep practices in their care delivered to parents and caregivers.

One gap in knowledge was evidenced by the fact that only 21.7% of participants knew approximately how many infants die from SUIDs in New York City each year. However, this number more than doubled after the educational module. When asked “Do you know which borough had the highest rate of SUIDs in 2014 only 13.0% of the participants answered correctly in the pre-test but 73.9% answered correctly in the post education test. When asked “How many weeks from birth does it generally take for an infant to hold her/hers head up on their own, 26.1% answered correctly in the pre-test but 60.9% knew the correct answer at the programend.

Findings in this study support the findings of multiple related research studies. For example, Lindeman (2016) reported findings from a study conducted by the University of Colorado and Children’s Hospital of Colorado that involved 43 teenage mothers with children in daycare centers throughout the state. The results indicated that mothers let instincts override expert healthcare providers’ recommendations about safe sleep for their infant. Although mothers were familiar with recommendations against co-sleeping, and practices that include blankets, pillows, and soft bedding, many ignored these recommendations and continued to sleep with their baby because they felt their infants were safer with them and would get better rest in bed with them (Lindeman, 2016).

A recent exploratory study using qualitative data collected for 167 SUID (2004-2010) cases in New York City revealed that although 48% of caregivers had cribs and bassinets available for their infants, their lack of safe sleep knowledge and cultural beliefs led them into bed sharing and other unsafe sleep practices that proved fatal for their infants (Chu, Hackett, &
Kauer, 2015). A study conducted in 2010 in an anonymous online questionnaire and involving a sample of 1000 out of 2000 total of women aged 18 with infants up to 24 months old (Homer et al., 2012), the authors found that parental sleep deprivation including responsibilities for infant care, results in exhaustion for new and experienced parents. In turn, this sleep deprivation plays a role in the parents’ practices with respect to infant sleep. Parents tend to sleep with their newborn child when they become tired, especially when breastfeeding, and feel co-sleeping is more comforting to a crying baby. These conditions contribute to creating unsafe sleeping environments for infants (Homer et al., 2012).

The National Action Partnership to Promote Safe Sleep (NAPPSS) was formed by the Maternal and Child Health Bureau to help reduce infant mortality (“About,” 2015). Their integrated approach relays the message that breastfeeding is protective, but healthcare providers often address feeding and the safe sleep message separately. NAPPSS believes that conversations with families can integrate safe sleep and breastfeeding promotion, steering campaigns to conversations (“About,” 2015). Conversations are paramount because they are interactive and leave room for new parents and caregivers to ask questions.

A comparative study of two hospitals revealed many irregularities in education, and practice of safe sleep recommendations. Observed practice differences included inappropriate sleep position placement, numbers and types of crib objects found in the infant crib, and various numbers and types of soft bedding found in the crib. Discharge education in a hospital setting varied, as did beliefs in the association between infant sleep position and SUIDs (Patton, Stiltner, Wright, & Kautz, 2015).

Perinatal, infant, and Ob-Gyn nurse educators who have a duty to ensure parents understand the increased risk of SUIDs concurrent with infant bed sharing (Chu et al., 2015;
Results show a marked improvement in knowledge in all of the questions after education was delivered. This points to the need for effective education, which must be frequent and consistent. For example, public health systems appointing task forces for communities in need. The efforts should start with awareness and creative strategies such as using the media or technology.

**Limitations**

Limitations included, a nonrandom convenience sample, nominal level statistical testing, no control groups, surface validity of survey instrument, and reliability of research untested. The participant sample size in this study was low. Approximately one-third of potential participants were not eligible to partake in the study, because they did not care for infants and/or pregnant women. A convenience sample was used for this pilot study, rather than random sampling. In addition, a limitation was that there were three participants who dropped out. Because this may be the first study to examine the knowledge level and belief attitudes of healthcare providers, including advanced practice nurses, these findings may not be generalizable to the overall APN population.

**Implications for Practice**

This scholarly project revealed gaps in knowledge with regard to healthcare providers’ knowledge regarding safe sleep messaging. When healthcare providers are informed about SIDS recommendations, this study revealed they may be more likely to advocate for the safe sleep message. Furthermore, they can appropriately relay the scientific evidence and rationale for why these strategies should be enforced. Safe sleep education among healthcare providers can be disseminated through conversations with families and caregivers, at conferences, through webinars, and in publications.
Conclusions

For the past twenty years in New York City, an average of one infant continues to die each year due to SUIDs. Healthcare providers, including advanced practice nurses have a duty to educate parents on how to keep infants safe. Policies need to be updated to include the latest 2016 AAP safe sleep guidelines to reduce the risk of SUIDs. This small pilot study examined the knowledge and beliefs of healthcare providers in a single primary care facility. It was a very useful study that has implications for: clinical practice, for individual (parental and caregiver) behavioral change and for healthcare policy.

This may be the first doctor of nursing project to identify gaps in knowledge, and to see change in beliefs in a small group of healthcare providers in a MUA that is not adequately receiving the safe sleep message. As the research continues to identify factors involved in cases of SUID, a consistent evidence-based message may make the difference in a preventable death. It is clear from statistics reported about SUID that there is a notable gap in getting this message to parents and caregivers, and understanding what barriers may hinder healthcare providers from successfully making a difference needs to be further explored.
Bibliography


Appendix A

Approval

Title of Project: Impact of Health Provider Education Related to Safe Sleep Practices on Care Delivery: A Pilot Study

Name of Student: Noreen Mulvanerty Date Submitted: 11/14/2016

Georgetown University IRB Approval Date: 4/7/2016

Location of DNP Scholarly Project Implementation: Opportunity Development Association (ODA), 14 Heyward Street, Brooklyn, New York, 11249

Facility IRB Approval Date: 8/12/2016 Project

Team Mentor: Carol Taylor, PhD, RN

Signature: ________________________________
Date: ________________

DNP Program Director: Margaret Slota, DNP, RN, FAAN

Signature: ________________________________
Date: ________________

Project Team Member Name: Irene Jillson, PhD Signature:

______________________________
Date: ________________

Project Team Member Name: Peggy Regensburg, PhD, LMSW

Signature: ________________________________
Date: ________________
Appendix B

Table 3: Summary and Strength of Recommendations

AAP Safe Sleep Recommendations 2011

Level A recommendations

Back to sleep for every sleep

Use a firm sleep surface

Room-sharing without bed-sharing is recommended

Keep soft objects and loose bedding out of the crib

Pregnant women should receive regular prenatal care

Avoid smoke exposure during pregnancy and after birth

Avoid alcohol and illicit drug use during pregnancy and after birth

Breastfeeding is recommended

Consider offering a pacifier at nap time and bedtime

Avoid overheating

Do not use home cardiorespiratory monitors as a strategy for reducing the risk of SIDS Expand the national campaign to reduce the risks of SIDS to include a major focus on the safe sleep environment and ways to reduce the risks of all sleep – related infant deaths, including SIDS, suffocation, and other accidental deaths; pediatricians, family physicians, and other primary care providers should actively participate in this campaign
Level B Recommendations

Infants should be immunized in accordance with recommendations of the AAP and Centers for Disease Control and Prevention. Avoid commercial devices marketed to reduce the risk of SIDS. Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagioccephaly.

Level C Recommendations

Health care professionals, staff in newborn nurseries and NICUs, and child care providers should endorse the SIDS risk-reduction recommendations from birth. Media and manufacturers should follow safe-sleep guidelines in their messaging and advertising. Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely.

These recommendations are based on the U.S. Preventive Services Task Force levels of recommendation (www.uspreventiveservicestaskforce.org/uspstf/grades.htm).

Level A: Recommendations are based on good and consistent scientific evidence (ie, there are consistent findings from at least 2 well-designed, well-conducted case-control studies, a systematic review, or a meta-analysis). There is high certainty that the net benefit is substantial, and the conclusion is unlikely to be strongly affected by the results of future studies.

Level B: Recommendations are based on limited or inconsistent scientific evidence. The available evidence is sufficient to determine the effects of the recommendations on health outcomes, but confidence in the estimate is constrained by such factors as the number, size, or quality of individual studies or inconsistent findings across individual studies. As more
information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Level C: Recommendations are based primarily on consensus and expert opinion (‘‘SIDS and Other, 2011.’’)
Appendix C

Table 4: Summary and Strength of Recommendations

AAP Safe Sleep Recommendations 2016

**Level A Recommendations**

Back to sleep for every sleep
Use a firm sleep surface
Breastfeeding is recommended

Room-sharing with the infant on a separate sleep surface is recommended

Keep soft objects and loose bedding away from the infant’s sleep area

Consider offering a pacifier at naptime and bedtime

Avoid smoke exposure during pregnancy and after birth

Avoid alcohol and illicit drug use during pregnancy and after birth

Avoid overheating

Pregnant women should seek and obtain regular prenatal care

Infants should be immunized in accordance with AAP and CDC recommendations

Do not use home cardiorespiratory monitors as a strategy to reduce the risk of SIDS

Health care providers, staff in newborn nurseries and NICUs, and child care providers should endorse and model the SIDS risk-reduction recommendations from birth

Media and manufacturers should follow safe sleep guidelines in their messaging and advertising

Continue the “Safe to Sleep” campaign, focusing on ways to reduce the risk of all sleep-related infant deaths, including SIDS, suffocation, and other unintentional deaths. Pediatricians and other primary care providers should actively participate in this campaign.
**Level B Recommendations**

Avoid the use of commercial devices that are inconsistent with safe sleep recommendations. Supervised, awake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly.

**Level C Recommendations**

Continue research and surveillance on the risk factors, causes, and pathophysiologic mechanisms of SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely.

(There is no evidence to recommend swaddling as a strategy to reduce the risk of SIDS.)

The following levels are based on the Strength-of-Recommendation Taxonomy (SORT) for the assignment of letter grades to each of its recommendations (A, B, or C).

**Level A:** There is good-quality patient-oriented evidence.

**Level B:** There is inconsistent or limited-quality patient-oriented evidence.

**Level C:** The recommendation is based on consensus, disease-oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening. Note: “patient-oriented evidence” measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, and quality of life; “disease-oriented evidence” measures immediate, physiologic, or surrogate end points that may or may not reflect improvements in patient outcomes (e.g., blood pressure, blood chemistry, physiologic function, pathologic findings). CDC, Centers for Disease Control and Prevention (“SIDS and Other,” 2016)
Appendix D

Definition of Terms

Asphyxia: The lack of oxygen in the body that occurs when breathing is halted.

Bed sharing: Adults and children sharing a sleep space.

Infant: A newborn up to the age of one years old.

Insular: Disinterested in other cultures, practices, religions, or ways of life.

Mechanical suffocation: The disruption of the ability to breathe as a result of strangulation or smothering.

Medically Underserved Area (MAU): A geographical area that has a lack of healthcare assets and capabilities. Equipment and medical personal is extremely limited. The community can be low-income.

Medico-legal investigator (MLI): A forensic scientist who investigates dubious deaths with frequently unknown causes.

Obligate Nasal/Nose Breathing: When one has a physiological requirement to breathe through the nose instead of the mouth.

Orthodox Jewish Tradition: A form of Judaism which subscribes to the Torah as authorized in by Tannaim and Amoraim in Talmudic texts.

Overlay: When something covers the surface of another.

Oxygen \((O_2)\) Saturation Level: the measure of oxygen carried or dissolved in a specific medium. A dissolved oxygen probe such as an oxygen sensor can sense this.

Prone: A position where one lays with the front or face downward.

Perinatal: The time immediately before and after birth, give or take several weeks.

Room-sharing: When an adult and infant sleep in the same room but on separate surfaces.
**Suffocation:** When breathing stops.

**Supine:** A position where one lays face upward.

**Yiddish:** A language historically of Ashkenazic Jews of Central and Eastern Europe.