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Improving Pediatric Providers' Intent for Safe Sleep Anticipatory Guidance With an Electronic
Educational Intervention

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing
Practice at the University of Kentucky

By

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Abstract

Background: Sudden Infant Death Syndrome or SIDS is the fourth leading cause of infant mortality in the United States. There is no definitive cause of death pertaining to SIDS, but certain risk factors have been identified that increase the risk of SIDS in an infant. While safe-sleep education during the prenatal time of parenthood is important, it is also essential to continue this education comprehensively in the primary care setting and in any other exposure the family has to healthcare.

Objective: The objective of this study is to evaluate the self-reported knowledge of University of Kentucky Children's Hospital Pediatric Residents', confidence, and beliefs on anticipatory guidance in relation to safe sleep practices before and after a virtual safe sleep educational intervention.

Methods: Using a pre- and post-test design, this single site quasi-experimental study included: (1) Pre-intervention electronic survey (2) PowerPoint educational intervention via E-Mail (3) Post-intervention electronic survey. Convenience sampling was used among medical residents in the UK Pediatric Residency Program (n=70) for eligible participants. Descriptive statistics and odds ratios were generated to determine statistical significance.

Results: Of the 70 eligible participants, 13 participants (n=13) completed the pre-survey, resulting in an 18.5% response rate. Only 1 of the 13 eligible participants completed the post-survey in its entirety resulting in a 7% response rates. This caused the main data to be pulled from the pre-survey responses. Results found that 23.1% of residents found discussing safe sleep is difficult. Barriers that were identified for safe sleep education were time (30.8%), not enough resources (15.4%), and patients not being interested in receiving education (15.4%). Things that were identified by the sample that would aid in educating families are additional training (69.2%), educational videos for families (53.8) and printed materials to share with families (100%). Lastly, only 46.2% of the sample had received formal safe sleep education.

Conclusions: Providing additional training and materials to providers on the topic of safe sleep anticipatory guidance could improve their confidence in providing safe sleep education to families.

Key Words: Infant Safe Sleep; Pediatrics Providers; Intervention

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Dedication

This final DNP Project is dedicated to my husband, Noah Hamilton. Without his constant encouragement and support for the last three years I would not have been able to have reach to the goals I had set for myself and achieved everything I had dreamed of. Thank you.

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Background and Significance

Sudden Infant Death Syndrome or SIDS is the fourth leading cause of infant mortality in the United States (Newberry, 2019). Sudden Infant Death Syndrome (SIDS) is “the unexplained death, usually during sleep, of a seemingly healthy baby less than a year old” (Mayo Clinic, 2020). There is no definitive cause of death when discussing SIDS, but certain risk factors have been identified that increase the risk of SIDS in an infant. Such risk factors include several environmental risk factors such as the infant sleeping on their side or stomach, sleeping on a soft surface, sharing a bed or sleeping on the couch with family, a sibling or pet sharing the bed with the infant (Mayo Clinic, 2020). These environmental factors are what the American Academy of Pediatrics have targeted with their “Back to Sleep” campaign.

“Back to Sleep” is the American Academy of Pediatrics standard of care for safe sleep practices. This campaign was started in 1994 and was a collaboration between the American Academy of Pediatrics (AAP), the National Institute of Child Health and Development, and the Maternal and Child Health Bureau of Health Resources and Services Administration and SIDS group (American Academy of Pediatrics, 2020). The parameters of this campaign focused on educating parents to place their infant on their back to sleep, alone on a firm surface with no extra blankets or toys. Since 1994 the number of SIDS related deaths dropped from 4,073 to 2,063 by 2010 (National Institute of Child Health and Development, 2020). Most recently, the AAP has updated their guidelines and sent out a new and updated standard of care. The most noticeable change is the recommendation that the infant should sleep in the parent’s room but on a separate surface explicitly made for infants and avoid co-sleeping (American Academy of Pediatrics, 2016). According to an analysis of major case-control studies, sharing a sleeping

surface, or co-sleeping, increases the risk of SIDS by five times in a breastfed infant under the age of 3 months (Carpenter et al., 2013). While following this and the other safe sleep guidelines set by the AAP cannot wholly prevent SIDS, utilizing these actions can increase the safety of the infant while sleeping. Prior to 2016, the number of infant deaths with unknown cause was seeing an increase from 22 per 100,000 live births in 2011 to 30.1 per 100,000 in 2015 (CDC, 2021). Since 2016 the number of infant deaths with unknown cause and SIDS rates are falling and continue to decrease.

Safe sleep education is essential to infant safety and should be continued comprehensively in the primary care setting and in any other exposure the family has to healthcare. According to Raines (2018), the gap between what new parents are taught by healthcare professionals and what they perform at home indicate that simply teaching families once before they go home is not enough to ensure they follow safe sleep recommendations. Raines also recommends primary care providers take into account the many factors that may influence a parent's decision and continue education with every exposure to primary care. Research suggested that while other factors such as family members and what their mother did influenced their decision it was also found that primary care providers guidance and AAP recommendations influenced the decision of where their infant slept. Many times, safe sleep is not modeled by the healthcare workers with hospitalized infants. Frey et al. (2018) found in a baseline audit of 100 infants in Comer Children's Hospital, zero of the patients were found to be completely compliant to safe sleep recommendations. Healthcare workers in all settings, must be appropriately informed to give the best education to the families of infants.

DNP Project

Purpose

The purpose of this study to evaluate the current knowledge of pediatric residents on safe sleep and consistency of discussing this with patients.

Specific Aims

The specific aims of this study are to a) determine UK pediatric residents' knowledge of the most recent AAP infant safe sleep guidelines and their confidence in their ability to provide anticipatory guidance on these recommendations, b) to identify the importance of safe sleep anticipatory guidance among UK pediatric residents during every exposure to healthcare, c) to identify the perceived barriers to addressing infant safe sleep with parents during healthcare visits, and d) to assess the residents' self-reported behaviors regarding infant safe sleep anticipatory guidance.

Expected Outcomes

The expected outcomes of this research study are to increase the knowledge of the AAP infant safe sleep recommendations among pediatric residents at UK, to increase UK pediatric residents' confidence with providing infant safe sleep anticipatory guidance and to increase the knowledge of the importance of discussing infant safe sleep during every healthcare exposure.

Theoretical/Conceptual Framework

The theoretical framework for this study is the Promoting Action on Research Implementation in Health Services (PARiHS) framework. In the PARiHS framework an emphasis creating a shared understanding of the benefits and disadvantages of a new practice (Kitson, Harvey & McCormack, 1998). This theoretical framework was chosen for this study

because it places the emphasis on involving key stakeholders. Having residents involved in implementing any changes based on the findings from this study would allow them to feel more involved in the process and be more willing to be a participant in the implementation of a change. Letting the stakeholders be involved allows the negotiation and development of the change in practice. In this case, having residents evaluate their own knowledge and be involved in the presentation they can see the benefits to the change in consistently discussing safe sleep with their patients. These steps will allow the objectives of this study to be met in collaboration with the residents.

Literature Review

A literature review evaluating the knowledge, beliefs, and anticipatory guidance behaviors regarding safe sleep education of pediatric providers was performed. The review was guided by the PICOT question: In pediatric primary care offices, does providing a presentation to providers about safe sleep education, compared to current practice, increase the knowledge and number of consistent conversations about safe sleep between providers and patients? To research the current gaps in education the following databases were used: CINAHL and Google Scholar. On these databases, the keywords used were “safe sleep”, “co-sleeping,” “back to sleep,” and “SIDS.” On CINAHL these keywords produced 4,419 results as well as millions that were produced by this search on Google Scholar. The articles were then filtered using criteria such as only including English-speaking countries, used the population of infants, their families, or pediatric primary care providers. Articles also must have been published in the last 16 years ranging from 2005-2021. After evaluating the articles found on the search with the inclusion and exclusion criteria a total of 30 randomized controlled trials, qualitative studies, and expert opinion articles were selected for further evaluation. After these 30 articles were further

evaluated the number was narrowed down to nine articles to be synthesized. These nine articles all gave insight that furthered the research of the PICOT question or added a new facet into what the next steps with this PICOT questions will include. The other 21 articles were excluded from the final nine because they gave background information more than providing evidence that helped to answer the PICOT question.

Synthesis of Literature

The evidence of different education practices varied. While some families respond well to one type of education another group may not gain the same confidence from the same style of education. For example, a community baby shower that was advertised to expectant mothers that were high risk for adverse birth outcomes had a group of certified safe sleep instructors provide a presentation on safe sleep (Ahler-Schmidt et al., 2018). Ahler-Schmidt et al. (2018) found that this form of education was successful in changing 13.8% of mother's opinions on some aspects of safe sleep. Similarly Canter et al. (2015) found that exposing a mother to a video about safe sleep during their stay on the postpartum unit showed 95.3% of women planning on placing their infants alone to sleep and 78.6% planning to put them on their back. While some tactics worked some mothers may not learn from a presentation or video. At the community baby shower another 12.9% of mothers felt there was no opinion change, and 0.5% thought they were less likely to place their infant on their backs after the presentation (Ahler-Schmidt et al., 2018). In the hospital 16.3% of women who were watched the video indicated they would allow the infant to sleep in a chair or couch compared to 8.5% of mothers who didn't see it and did not plan to allow it. Clearly, this education was not successful in all aspects (Canter et al., 2015).

Modeling safe sleep is a highly effective way to educate families on safe sleep. Education will also come at all different times during the beginning of the infant's life. During an infant's time in the NICU, or in the direct postpartum time, safe sleep education may be left behind or not modeled by staff for a variety of reasons. Education during these times is especially important. A handout given to family prior to discharge from the NICU showed a 68% retention rate of the safe sleep practices one-month after a discharge home (Dufer & Godfrey, 2016). When implementing a safe sleep toolkit in 8 different maternity units Kellams et al. (2017) found an increase in the adherence of safe sleep protocol among parents and staff on the unit. After initiation of the toolkit, 90% of infants were seen in a compliant safe sleep position among healthy infants. However, some new educational styles are not as effective as older presentation styles. When comparing handouts to a new children's book about safe sleep, there was little difference in how the information was perceived (Hutton et al., 2017). Additionally, a study done in Australia focusing on two different educational plans McIntosh et al. (2017) found very little difference in the results of the two different methods in portraying the information. This evidence indicated a need for personalization of education to individual families.

Another area of research focuses on the information being discussed with families by their healthcare providers. Evidence shows that pediatric primary care providers are not supplying the families with adequate information or information that follows the most recent AAP recommendations. Burell et al. (2019) found that 92% of well-child visits at a pediatric primary care office included at least one aspect of safe sleep. However, they were inconsistent with the AAP recommendations as well as Schaeffer & Asnes (2017) finding that advice given by pediatricians varied from congruent to incongruent to the AAP recommendations. Schaeffer & Asnes (2017) also found that most pediatricians are giving advice that is incongruent with AAP

recommendations. This evidence shows gaps in the education of not only the families but the providers responsible for educating the families. The cause for this could have many variables. In Australia a review of recommendations revealed that families and providers were receiving contradicting information from “minimize the risk” to “remove the risk” and different agencies providing different information (Cunningham, Vally & Begeja, 2018). A review of national and global recommendations for safe sleep education endorses all hospital and primary care providers be educated on current safe sleep guidelines in order to discuss this information with parents at every infant health encounter.

Primary care offices are the main source of medical care for infants. Parents receive most of their education from their primary care providers and depend on them for anticipatory guidance. This puts a stress on pediatric primary care providers to commit to providing anticipatory guidance on infant safe sleep. Schaeffer and Asnes (2018) surveyed 24 pediatricians to determine what anticipatory guidance they were providing to their patients. It was found that while the majority of the pediatricians adhered to recommending the supine position for sleep there was a variance in the other recommendations, and some reported only discussing sleep recommendations if the caregiver was concerned. This is not something seen in an isolated study, in the National Infant Sleep Position study it was found that over half of the surveyed parents had not received any anticipatory guidance from their primary care providers about safe sleep recommendations and those that did reported that they were less likely to co-sleep (Colson et al., 2013). This is something that should be discussed during well-child visits but is often not discussed Burrell et al. (2019) found that only 15% of 107 providers discussed bed-sharing, only 65% discussed being alone with no objects at the time of sleep. These findings along with those of the other two studies point to a gap in the education within the primary care settings.

Gaps and Limitations

While many aspects of the body of evidence are furthering research there were some flaws. The most significant flaw in the body evidence that used was the lack of randomized controlled trials (RCTs). While many RCTs were found, most of the studies found were single qualitative studies done with many in pre- and post-survey forms. This deficiency shows that more RCTs need to be done on the information given to families to compare different methods of education rather than comparing knowledge before and after one specific type of training, as most of the studies were. The other limitation found throughout the studies was sampling. Almost all articles in the body of evidence used a convenience sampling system compared to randomized sampling. This sampling hinders the applicability of the studies to a broader population. These flaws and limitations could be addressed by other researchers when continuing research in this field by designing different types of studies concerning safe sleep education.

Furthermore, there are still gaps in the knowledge of safe sleep education. While there was some research into the cultural reasoning behind practices of unsafe sleep there is a lack of research into other factors that lead to unsafe sleep habits. This topic that should be examined by future researchers regarding to safe sleep and the dissemination of education on the issue. Having a better understanding of the factors that lead to the practices will shine a light on interventions that will be more personalized and more influential against those factors.

Methods

Design

This study was a quasi-experimental study using pre and post testing. Institutional Review Board (IRB) approval was received from UK's IRB before this study began.

Sample

Convenience sampling was used to reach participants of the study. There was no control group. University of Kentucky College of Medicine Pediatric Residency Program was selected for sample population. There were a total of 70 pediatric residents eligible to participate. The participants will have inclusion criteria of taking care of infants, being enrolled in the University of Kentucky's residency program within University of Kentucky Children's Hospital. Exclusion criteria for this sample of providers include working with a patient population exclusively over the age of the 2 years old and those that do not provide direct medical care to patients

Setting

Agency Description

The study was conducted between 10/20/2021 and 12/10/2021 at Kentucky Children's Hospital (KCH) in Lexington, KY. KCH is a children's hospital contained within University of Kentucky Healthcare medical center. It contains a Level IV NICU, a PCICU, a PICU and an emergency room. KCH also includes several ambulatory pediatric offices focusing on primary care, acute illness, and specialties such as endocrinology, adolescent health, and development. The study was conducted virtually via emails and electronic surveys due to COVID-19 precautions at the University of Kentucky.

Facilitators and Barriers

For this study there are several potential facilitators and barriers. One facilitator is the established evidence-based safe sleep practice guidelines set by the American Academy of Pediatrics (AAP). The AAP has updated their safe sleep as recently as 2016 and while many providers have participated in continuing education some finished their education before the

most updated recommendations. These providers will be given the most up-to-date recommendations as well as the data that is out there about the gaps in safe sleep education being seen in primary care. Another facilitator of this study will be the lead investigator, Lindsay Hamilton, who will implement the educational intervention herself with her expertise as a pediatric critical care nurse and pediatric DNP student.

There is a single identified barrier to this study. The barrier is the current social distancing and visitation limitations still in place within KCH because of the COVID-19 pandemic. This limited any face-to-face time with residents. This was the cause for the need of the electronic intervention. To address this barrier, pediatric residents were given ample time to complete both the pre-survey as well as watch the PowerPoint and complete the post-survey. The PowerPoint contained photos demonstrating safe sleep and other graphics regarding anticipatory guidance to achieve some of the effect of an in-person presentation.

Stakeholders

There are two key stakeholders for this study. The first stakeholder being University of Kentucky School of Medicine residents. These providers are the target population of the study and were the participants in the pre- and post-survey and educational intervention. The willingness of these providers to participate was essential in the success of this study. The second key stakeholder for this study are the patient's and their families. The education that the providers are receiving, and their perceptions on education on safe sleep can directly impact the sleeping practices of families of infants.

Mission

This study is congruent with UK HealthCare’s mission, strategic plan, and goals. UK HealthCare’s main mission is to provide patient-centered care. This study addresses one key component of pediatric health, child safety. Providing families with the correct anticipatory guidance and resources about infant safe sleep will allow providers to give patient’s families feel that their infant’s safety is a focus of UK HealthCare. This study also supports the continuing education of the pediatric providers so that they are able to provide the best patient-centered care.

Procedures

IRB Approval

Approval for this study was obtained by the University of Kentucky Institutional Review Board (IRB) on October 8, 2021 (Protocol #70461). Implementation of the study began shortly after IRB approval was obtained.

Intervention

The intervention was comprised mainly of a pre- and post-survey and an educational PowerPoint presentation via email about infant safe sleep anticipatory guidance. The surveys assessed the knowledge, attitudes, current practice, and confidence of UK pediatric residents before and after an educational presentation. All pediatric residents that met inclusion criteria were included in sample. An email was sent to all residents that contained a brief description of the study and a link to the Qualtrics pre-survey. This survey remained open for three weeks to allow enough time for as much participation as possible.

The educational intervention was sent out on November 18, 2021. The educational intervention consisted of an 11 slide PowerPoint presentation as seen in *Appendix 2*. The

educational intervention was created by the PI Lindsay. The content of the PowerPoint consisted of educating the residents on 1.) American Academy of Pediatric safe sleep guidelines 2.) Sudden Infant Death Syndrome (SIDS) and 3.) the current research on safe sleep anticipatory guidance. Attached in the email with the presentation was a link to the Qualtrics post-survey. This survey stayed open for three weeks to give the residents enough time to complete the presentation and survey. Reminder emails were sent the day of each survey closure. Of the 70 pediatric residents eligible, 13 completed the pre-survey and of the 13 only 1 completed the whole of the intervention and post-survey.

Data Collection Plan

Data collection started once approval from the University of Kentucky's IRB was met. A waiver for informed consent was requested as the study was a voluntary web-based survey. The survey for this study, as seen in *Appendix: 1* consisted of multiple choice, true/false, Likert scale ratings, yes/no and demographic questions. The pre-survey consisted of 29 questions, and the post-survey consisted of 15 questions. Average survey duration was 10 minutes.

The data from the pre and post survey was collected by Qualtrics along with the email address of the participant. No other identifiable information was asked within the survey. To maintain the privacy of participants, Dr. Amanda Thaxton-Wiggins, PhD, a statistician from the UK College of Nursing, exported the data from Qualtrics. All data collection was stored electronically on the statistician's password protected and encrypted UK computer.

Measures and Instruments

The survey used for this study was adapted and modified with permission from one previously used by Michaels et al., (2018). There is no validated and reliable for this specific

topic however, the lead investigator, Nichole Michaels, PhD did a study with a large group of Obstetricians on the same topic. Reliability was addressed by using an already tested, credible infant safe sleep survey used in a previously published study (n=783) instead of creating a new survey for the purpose of this study.

In this study, multiple variables were assessed through data collected from the infant safe sleep survey. There were six main variable groups 1: Provider Demographics 2. Practice Demographics 3. Provider Knowledge 4. Anticipatory Guidance Behaviors 5. Confidence and Beliefs and 6. Believed Barriers

Data Analysis Plan

Descriptive statistics, including means and standard deviations or frequency distributions, as appropriate, were used to summarize survey items. All analysis was conducted using SPSS, version 25.

Results

Out of 70 eligible participants, 13 completed the pre-survey (n=13), resulting in a 18% response rate. Out of 70 eligible participants 1 completed the educational intervention and post-survey. This resulted in a response rate of 1.4%. Because of this the results analyzed are from the pre-survey results.

Demographics

As seen in Table 2 the study included representation from 5 different pediatric residency tracks. There were approximately double the number of female participants than male. The participants see a variety of patients of different ethnicities and insurance type.

Findings

Provider Knowledge

This study found that these resident providers did have the basic knowledge of the American Academy of Pediatrics (AAP). As seen in Table 3, see Appendix 1, 100% of participants knew the correct position for sleep but there was some division regarding what is safe to put in the crib for safe sleep. 7.7% reported that they did not know what items were approved of AAP for sleep and 7.7% believed that a sleep positioning aid was approved. All participants were able to correctly identify the various true-false questions.

The other area of concern was the recommendation regarding the location of sleep. While the majority (92.3%) were able to identify the safe sleep locations such as the crib and bassinet there was still 7.7% of the participants that were not able to identify this. Being able to identify the correct recommendations is something that is essential for pediatric providers. Without the correct knowledge it negates any anticipatory guidance given.

Anticipatory Guidance Behaviors

Residents were asked about their current anticipatory guidance behaviors that they currently partake in. As seen in Table 3 the majority of residents regularly discuss bed-sharing, breastfeeding, infant sleep environment and other topics but less than half discuss pacifier use and room-sharing. All the participants report discussing safe sleep at least most of the time. The participants varied in response regarding the recommended room of the infant. The majority (61.5%) report discussing the correct recommendation while others not having a preference on this, not providing any guidance on this topic or to have the infant sleep in the separate room of the parent, which differs from the AAP recommendation.

Confidence and Beliefs

When asked about current beliefs and attitude regarding safe sleep anticipatory guidance the majority (61.6%) disagree that it is hard to discuss safe sleep during visits but 39.4% of respondents did agree or were neutral to the idea that providing anticipatory guidance on infant safe sleep is difficult. All participants reported that they were confident in their ability to provide safe sleep anticipatory guidance.

Believed Barriers and Resources

The participants were asked what perceived barriers and what resources would be beneficial to them. Participants identified several barriers to discussing safe sleep with their patient's families. The most identified barriers, as seen in Table 5, were time (30.8%), inadequate reimbursement for preventative counseling (15.4%) and limited access to resources (15.4%). Another barrier that was identified was that most offices do not provide education on this topic (7.7%).

Participants were then asked what resources could be beneficial to their practice to support anticipatory guidance to patient's families. In Table 6 it is seen that the most popular resources that could be useful are printed materials, educational videos, reminders in the electronic medical record system, and support from their colleagues. Resources such as endorsement from professional societies, increased reimbursement and formal training for other office staff members were deemed as less useful by the participants. This section of the survey also asked if the participants had ever received any formal training on SIDS or infant safe sleep. Most of the participants (53.8%) reported that they have never had any formal training.

Discussions

Implications for Practice, Education, Policy, and Research

From the survey responses several takeaways were noted. The many resources that would be considered helpful and supportive for providing proper safe sleep anticipatory guidance such as written materials and reminders built into the electronic medical record are not always readily available to providers such as noted by 15.4% of participants noting that they feel that they have limited barriers. Further studies should be done to see if resources such as an electronic medical record improve the regularity of discussing safe sleep during well child visits. A similar study was done in regard to screening for abdominal aortic aneurysms and using electronic reminders for residents to remind them to screen for this. The study found that the electronic reminders were a valid and reasonably effective strategy to improve screening (Sypert et al., 2017). Using this same technique could be transferred to a number of topics including infant safe sleep.

Demographic results from the survey determined there is many diverse races with majority being on public health insurance. These findings along with the largest barrier to providing anticipatory guidance being not having enough time to provide adequate counseling indicate the need for more resources in a variety of languages. Having the printed or access to videos in a variety of languages would allow providers the ability to provide better anticipatory guidance to all their patient's families regardless of ethnicity or socioeconomic class.

Objectives of the study were not met. The objectives of this study would have been evaluated with the post-survey. Because of the low number complete responses of the post-survey the ability to evaluate the outcomes were hindered. The information discovered through the pre-survey were important findings and opened channels of further research needed. The pre-survey was able to evaluate the current confidence of pediatric residents and delve into what

barriers are preventing residents from feeling completely confident in the providing infant safe sleep education.

Future research is still required regarding what the best resources will encourage the most effective anticipatory guidance. Having a researcher incorporate the electronic medical record reminder could provide further insight into if this would be an effective resource versus increased written material or the current resources that are provided to providers in the office. Other topics to further explore could be offices in the urban location versus suburban and discuss the difference in commonality of the anticipatory guidance in these contrasting locations.

Limitations

There are a few limitations of this study, the largest being the low number of responses with the post-survey. Having a larger sample may allow a larger response group to gather further data. The low response rate can be partially attributed to the virtual setting because of COVID-19. Having the intervention in person could have increased the number of responses from the pediatric residents but was not an option for this study as in-person meetings are limited, and scheduling of a synchronous Zoom or in-person training was unable to happen due to scheduling conflicts with the main researcher.

Conclusion

Infant safe sleep education is important to continue to reduce the number of sleep related injuries to infants. This means that families having the proper education regarding the American Academy of Pediatrics most recent recommendations during any exposure to healthcare is of the utmost importance. Previous studies have shown a lack of consistency with safe sleep

anticipatory guidance. Pediatric providers need to increase the amount of correct anticipatory guidance to families with infants.

This study shows there is a need for increased resources and formal infant safe sleep training for pediatric providers. Having pediatric providers attend formal infant safe sleep education would allow more providers to have the confidence and ability to give succinct anticipatory guidance regardless of time allowed as this was seen as the largest barrier to giving proper guidance. Further studies should focus on possible interventions that can be incorporated to consistently remind providers about providing safe sleep guidance. Furthermore, synchronous web or in person learning opportunities are more likely to yield more positive results than asynchronous web trainings.

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Tables

Table 1. Demographic and workplace characteristics ($n = 13$)

Characteristic	<i>mean (SD) or n (%)</i>
Age	29.42 (4.795)
Gender	
Male	4 (30.8%)
Female	9 (69.2%)
Race	
White or Caucasian	10 (76.9%)
Black or African American	3 (7.7%)
Asian or Pacific Islander	2 (15.4%)
Hispanic or Latino	0 (0%)
Setting	
Pediatric	9 (69.2%)
Internal Medicine	1 (7.7%)
Internal Medicine – Pediatrics	1 (7.7%)
Med/Peds	1 (7.7%)
Triple Board Certified	1 (7.7%)
Patients seen in clinic per day	
Less than 25	12 (92.3)
25 or more	1 (7.7)
Primary Practice Location	
Kentucky	13 (100%)
Current Residency Year	
1	4 (30.8%)
2	7 (53.8%)
3	2 (15.4%)
Location of Principle Practice	
Suburban	7 (53.8%)
Urban	6 (46.2%)
Percentage of Patient Population – Race	
Hispanic/Latino	20.42 (9.643)
White/Caucasian	58.90 (14.177)
Black/African American	23.70 (12.702)
Asian/Pacific Islander	7.75 (6.089)
American Indian/Alaska Native	2.75 (4.496)
Percentage of Patient Population – Insurance	
Private	26.82 (17.215)
Public	60.82 (24.091)

Military/Government	10.33 (15.240)
Not Insured	10.57 (10.675)

Table 2. Knowledge-based Questions

Knowledge Questions	<i>n (%)</i>
What is the AAP Recommendation for sleep position? Back	13 (100)
What are the AAP approved sleep environments? Bassinet or Cradle Crib Portable Crib/Pack-n-play I don't know	12 (92.3) 9 (69.2) 4 (30.8) 1 (7.7)
What items are approved by AAP for sleep? Fitted crib sheet Pacifier Sleep positioning device (i.e. wedge) I don't know	12 (92.3) 6 (46.2) 1 (7.7) 1 (7.7)
The risk of SIDS can be reduced True False	13 (100) 0 (0)
Infants are more likely to aspirate when placed on their back to sleep True False	0 (0) 13 (100)
It is safe for mothers and infants to bed-share if the infant is exclusively breastfed and the mother is not obese or under the influence. True False	0 (0) 13 (100)
Prenatal and/or postnatal exposure to cigarette smoke increases SIDS risk True False	13 (100) 0 (0)

Table 3. Current Anticipatory Guidance Behaviors

Anticipatory Guidance Behavior Questions	<i>n (%)</i>
Topics Regularly Discussed with Patients	
Bed-Sharing	12 (92.3)
Breastfeeding	12 (92.3)
Car seat selection/use	10 (76.9)
Childproofing/home safety	11 (84.6)
Infant sleep environment	12 (92.3)
Infant sleep position	12 (92.3)
Pacifier use	5 (38.5)
Room-sharing	6 (46.2)
Routine immunizations	13 (100)
Tobacco cessation	10 (76.9)
Recommended Sleep Position	
On back	13 (100)
Other	0 (0)
Acceptable Location for Sleep	
Crib or Bassinet	13 (100)
In a co-sleeper	1 (7.7)
In parent's bed	0 (0)
No preference	0 (0)
Other	0 (0)
Recommended Rooms for Infant Sleep	
I do not make these recommendations	1 (7.7)
In a separate room from parents	1 (7.7)
In same room as parents	8 (61.5)
No preference	2 (15.4)
Other	1 (7.7)
Regularly Discuss SIDS risk reduction or Safe Sleep	
All of the time	10 (76.9)
Most of the time	3 (23.1)
Some of the time	0 (0)
Never	0 (0)
Ways that Discuss Safe Sleep	
Recommendation	4 (30.8)
Provide Printed Materials	12 (92.3)
Answer Questions	12 (92.3)
Show Video	0 (0)
Other	

Table 4. Confidence and Beliefs

Confidence and Beliefs	<i>n (%)</i>
It is important for obstetricians to discuss SIDS/Infant safe sleep with patient’s families. Strongly Agree Agree Neutral Disagree Strongly Disagree	8 (61.5) 5 (38.5) 0 0 0
It is difficult to provide SIDS/infant safe sleep education. Strongly Agree Agree Neutral Disagree Strongly Disagree	2 (15.4) 1 (7.7) 2 (15.4) 4 (30.8) 4 (30.8)
SIDS/infant safe sleep education is an important part of pediatric care Strongly Agree Agree Neutral Disagree Strongly Disagree	11 (84.6) 2 (15.4) 0 0 0
I can influence my patients’ decisions related to SIDS/infant safe sleep. Strongly Agree Agree Neutral Disagree Strongly Disagree	6 (46.2) 5 (38.5) 2 (15.4) 0 0
I am confident in my ability to provide guidance to patients on SIDS/infant safe sleep Strongly Agree Agree Neutral Disagree Strongly Disagree	6 (46.2) 7 (53.8) 0 0 0

Table 5. Barriers to Providing Anticipatory Guidance

Barriers	<i>n (%)</i>
I do not have enough time to address this topic with my patients. Yes	4 (30.8)
Inadequate reimbursement for prevention counseling. Yes	2 (15.4)
Patients are not interested in receiving education on this topic. Yes	2 (15.4)
Most offices do not provide education on this topic. Yes	1 (7.7)
Providing education on this topic is not the norm in my practice/clinic. Yes	0 (0)
Not enough resources (limited staff time, materials, etc.) to devote to this topic Yes	2 (15.4)
Residents and nurses are not educated on this topic. Yes	0 (0)
My practice is not the appropriate place for this education. Yes	0 (0)
SIDS/infant safe sleep is not addressed in residency training. Yes	0 (0)
Disagreement with the AAP's SIDS/infant safe sleep recommendations. Yes	0 (0)

Table 6. Supportive Resources

Resources for Support	<i>n (%)</i>
Are you interested in providing SIDS/infant safe sleep education to your patient's families? Yes	13 (100)
Would printed materials support you in providing SIDS/infant safe sleep education to your patient's families? Yes	13 (100)
Would educational videos support you in providing SIDS/infant safe sleep education to your patient's families? Yes	13 (100)
Would training for yourself support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	9 (69.2) 4 (30.8)
Would patient education reminders in the EMR support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	11 (84.6) 2 (15.4)
Would endorsement by professional societies support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	6 (46.2) 6 (46.2)
Would increased reimbursement support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	8 (61.5) 5 (38.5)
Would SIDS/infant safe sleep education or training for other office staff support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	8 (61.5) 5 (38.5)

Would support from colleagues support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	 10 (76.9) 3 (23.1)
Would a change to office policies support you in providing SIDS/infant safe sleep education to your patient's families? Yes No	 10 (76.9) 3 (23.1)
Have you ever received formal training on SIDS/infant safe sleep? Yes No	 6 (46.2) 7 (53.8)

Appendices

Appendix 1: Survey

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Default Question Block

Which of the following topics do you plan to regularly discuss with patients? MARK ALL THAT APPLY

- Bed-sharing (parent and infant sharing a sleep surface)
- Breastfeeding
- Car seat selection/use
- Childproofing/home safety
- Infant sleep environment (bedding, mattress, items in crib)
- Infant sleep position
- Pacifier use
- Room-sharing (infant and parent(s) sleeping in the same room, but not sharing a sleep surface)
- Routine immunizations for infants
- Tobacco smoking cessation

What do you recommend to patient's families regarding how they should place their infant for sleep? CHOOSE ONE

- I do not make recommendations to patients on this topic
- On the back
- On the side
- On the stomach
- Back or side
- Stomach or side
- Back or stomach
- Sleep position does not matter
- Other

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Which do you recommend to patient's families as acceptable places for an infant to sleep? MARK ALL THAT APPLY

- I do not make recommendations to patients on this topic
- In a crib or bassinet
- In a co-sleeper (baby sleep surface that can be placed in the parent's bed or attached to the side)
- In the parent's bed
- No preference
- Other

Which do you recommend to patient's families as the best room for an infant to sleep in? CHOOSE ONE

- I do not make recommendations to patients on this topic
- In a separate room from the parent(s)
- In the same room as the parent(s)
- No preference
- Other

How often do you plan to discuss Sudden Infant Death Syndrome (SIDS) risk reduction and/or infant safe sleep with patient's families?

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| All of the time | Most of the time | Some of the time | Never |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How do you make SIDS/infant safe sleep recommendations to your patient's families? Respond "YES" or "NO" to each item.

Yes

No

	Yes	No
I initiate discussion of SIDS/infant safe sleep-related topics with my patient's families.	<input type="radio"/>	<input type="radio"/>
I provide printed materials to my patient's families about SIDS/infant safe sleep	<input type="radio"/>	<input type="radio"/>
I answer SIDS/infant safe sleep questions that my patients bring up.	<input type="radio"/>	<input type="radio"/>
I show a video to my patient's families about SIDS/infant safe sleep.	<input type="radio"/>	<input type="radio"/>
Other <input type="text"/>	<input type="radio"/>	<input type="radio"/>

According to current recommendations from the American Academy of Pediatrics (AAP), which of the following is/are the safest sleep position(s) for most infants? CHOOSE ONE.

- On the back
- On the side
- On the stomach
- Back or side is equally safe
- Stomach or side is equally safe
- Back or stomach is equally safe
- Sleep position doesn't matter
- I don't know

According to the AAP, which of the following environments are recommended for routine infant sleep? MARK ALL THAT APPLY

- Armchair or recliner
- Bassinet or cradle
- Car seat

- Co-sleeper (baby sleep surface that can be placed in the parent's bed or attached to the side)
- Couch or sofa
- Crib
- Crib with a drop side
- Infant swing
- Parent's bed
- Portable crib / play yard (Pack-and-Play or similar)
- I don't know

According to the AAP, which of the following are acceptable items to include in an infant's sleep environment? MARK ALL THAT APPLY

- Bumpers
- Comforter
- Fitted crib sheet
- Pacifier
- Pillow
- Quilt
- Sheepskin
- Sleep positioning device (i.e., wedge)
- Stuffed animal
- I don't know

The next four statements are True or False. Please mark your answers in the boxes.

	True	False	I dont know
The risk of SIDS can be reduced.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infants are more likely to aspirate when placed on their back to sleep.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prenatal and/or postnatal exposure to cigarette smoke increases SIDS risk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	True	False	I dont know
It is safe for mothers and infants to bed-share if the infant is exclusively breastfed and the mother is not obese or under the influence of drugs or alcohol.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent do you agree or disagree with the following statements?

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
It is important for obstetricians to discuss SIDS/infant safe sleep with patient's families.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is difficult to provide SIDS/infant safe sleep education.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SIDS/infant safe sleep education is an important part of pediatric care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can influence my patients' decisions related to SIDS/infant safe sleep.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident in my ability to provide guidance to patients on SIDS/infant safe sleep.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you perceive any barriers to providing SIDS/infant safe sleep education in your practice?

Yes
 No

What barriers do you perceive to providing SIDS/infant safe sleep education your practice?

	Yes	No
I do not have enough time to address this topic with my patients.	<input type="radio"/>	<input type="radio"/>
Inadequate reimbursement for prevention counseling.	<input type="radio"/>	<input type="radio"/>
Patients are not interested in receiving education on this topic.	<input type="radio"/>	<input type="radio"/>
Most offices do not provide education on this topic.	<input type="radio"/>	<input type="radio"/>
Providing education on this topic is not the norm in my practice/clinic.	<input type="radio"/>	<input type="radio"/>
Not enough resources (limited staff time, materials, etc.) to devote to this topic	<input type="radio"/>	<input type="radio"/>
Residents and nurses are not educated on this topic.	<input type="radio"/>	<input type="radio"/>
My practice is not the appropriate place for this education.	<input type="radio"/>	<input type="radio"/>
SIDS/infant safe sleep is not addressed in residency training.	<input type="radio"/>	<input type="radio"/>
Disagreement with the AAP's SIDS/infant safe sleep recommendations.	<input type="radio"/>	<input type="radio"/>
Other <input style="width: 150px; height: 15px;" type="text"/>	<input type="radio"/>	<input type="radio"/>

Are you interested in providing SIDS/infant safe sleep education to your patient's families?

- Yes
 No

What would help or support you in providing SIDS/infant safe sleep education to your patient's families?

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	Yes	No
Printed materials (handouts, brochures, etc.) to distribute to my patients.	<input type="radio"/>	<input type="radio"/>
Educational videos to share with my patient's families.	<input type="radio"/>	<input type="radio"/>
SIDS/infant safe sleep education or training for myself.	<input type="radio"/>	<input type="radio"/>
Patient education reminders built into the electronic medical record.	<input type="radio"/>	<input type="radio"/>
Endorsement by professional societies.	<input type="radio"/>	<input type="radio"/>
Increased reimbursement for prevention counseling.	<input type="radio"/>	<input type="radio"/>
SIDS/infant safe sleep education or training for other office staff.	<input type="radio"/>	<input type="radio"/>
Support from colleagues.	<input type="radio"/>	<input type="radio"/>
Office policies encouraging SIDS/infant safe sleep education.	<input type="radio"/>	<input type="radio"/>

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Sudden Infant Death Syndrome (SIDS)

- Sudden Infant Death Syndrome or SIDS is the fourth leading cause of infant mortality in the United States.¹
- Sudden Infant Death Syndrome (SIDS) is “the unexplained death, usually during sleep, of a seemingly healthy baby less than a year old”.²
- Risk factors for SIDS include environmental risk factors such as the infant sleeping on their side or stomach, sleeping on a soft surface, sharing a bed or sleeping on the couch with family, a sibling or pet sharing the bed with the infant.²

1. Newberry, J.A. (2019). Creating a safe sleep environment for the infant: What the pediatric nurse needs to know. *Journal of Pediatric Nursing* 44, 119-122.
2. Mayo Clinic. (2020). Sudden infant death syndrome (SIDS). <https://www.mayoclinic.org/diseases-conditions/sudden-infant-death-syndrome/symptoms-causes/syc-20352800?page=0&otems=10>

“Back to Sleep”

- Debuted in 1994, “Back to Sleep” is the safe sleep campaign established by the American Academy of Pediatrics in collaboration with the National Institute of Child Health and Development and the Maternal and Child Health Bureau of Health Resources and Services Administration.¹
- Since 1994, the number of SIDS related deaths dropped from 4,073 to 2063 by 2010.²

1. American Academy of Pediatrics. (2020). Reducing sudden infant death with “back to sleep”. <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/7-achievements/Pages/Reducing-Sudden-Infant-Death-with-Back-to-Sleep.aspx>

2. National Institute for Child Health and Development. (2020). Progress in reducing SIDS. <https://safetosleep.nichd.nih.gov/activities/SIDS/progress>.

AAP Recommendations

- Until their first birthday, babies should sleep on their backs for all sleep times—for naps and at night.
- Use a firm sleep surface.
- Only bring your baby into your bed to feed or comfort.
- Bed-sharing is not recommended for any babies.
- Room share—keep baby's sleep area in the same room where you sleep for the first 6 months or, ideally, for the first year.
- Keep soft objects, loose bedding, or any objects that could increase the risk of entrapment, suffocation, or strangulation out of the baby's sleep area

AAP Recommendations Cont.

- Do not let your child fall asleep on nursing pillows or pillow-like lounging pads.
- Never place your baby to sleep on a couch, sofa, or armchair.
- It is fine to swaddle your baby. When your baby looks like he or she is trying to roll over, you should stop swaddling.
- Try giving a pacifier at nap time and bedtime.

Moon, R.Y. (2021). How to keep your sleeping baby safe: AAP policy explained. American Academy of Pediatrics. Retrieved from <https://www.healthychildren.org/English/ages-stages/baby/sleep/Pages/A-Parents-Guide-to-Safe-Sleep.aspx>

Example of Safe Sleep



What's Wrong in This Picture?



The blanket should not be in the crib with the infant

Safe Sleep Anticipatory Guidance

- A study at Yale-New Haven Children's found that the safe sleep education being given by primary care providers varied between the AAP recommendations and conflicting recommendations.¹
- A study done in Maryland found that while some safe sleep counseling was happening, many conversations with providers did not include safe sleep at Well-Child visits in an urban clinic.²

1. Schaeffer, P., & Asnes, A. G. (2018). What Do Pediatricians Tell Parents About Bed-Sharing? *Maternal & Child Health Journal*, 22(1), 51-58.
2. Burrell, T.D., McDonald, E.M., Mahoney, P., Musci, R.J., Shields, W., Gielen, A. & Solomon, B.S. (2019). Content of infant safe sleep counseling and maternal reported practices in an urban clinic. *Academic Pediatrics*, 19(7), 801-807.

What Does This Mean for Providers?

- Primary care is first line of care for families.
- Safe sleep anticipatory guidance needs to occur at every visit during the first year of life.
- Keep yourself updated on AAP recommendations.
- If in the inpatient setting, remind providers to model safe sleep as much as possible.

Post Presentation Survey

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- Burrell, T.D., McDonald, E.M., Mahoney, P., Musci, R.J., Shields, W., Gielen, A. & Solomon, B.S. (2019). Content of infant safe sleep counseling and maternal reported practices in an urban clinic. *Academic Pediatrics*, 19(7), 801-807.
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