

NORTHERN ILLINOIS UNIVERSITY

Sudden Infant Death Syndrome and Nursing Implications

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Abstract

Sudden Infant Death Syndrome (SIDS) continues to be an ongoing health problem as it caused the death of approximately 1,600 infants in 2015. The aim of this thesis and research study was to examine at-risk populations, the factors that increase and decrease the risk of SIDS, educational needs, and the associated nursing implications. The thesis consists of a literature review focusing on literature within the past five years, as well as a research study conducted to investigate areas where further education on SIDS prevention is needed. The research study was a self-reported survey examining practices that parents and caregivers of infants do that increase and decrease the risk of SIDS. The survey was distributed on social media through the Qualtrics program, and responses were collected from October 31st, 2017 to November 14th, 2017. Results of the study found that there was an increased compliance rate with American Academy of Pediatrics' recommendations on SIDS prevention in comparison to other research studies. Areas in need of further education, such as the use of pacifiers while the infant is sleeping, were also identified.

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1. Background Information

1.1. 2015 Statistics.

Sudden Unexpected Infant Death (SUID) is when death of an infant occurs suddenly, and no cause is immediately identifiable (Center for Disease Control, 2017). Sudden Infant Death Syndrome (SIDS) is “the unexplained death of an infant younger than one year” (Bartlow, Cartwright & Shefferly, 2016). Death of infants from SIDS and SUID is an urgent issue that must be addressed. It is important to note that SIDS is a type of SUID; additional causes of death classified under SUID are accidental strangulation or suffocation and unknown causes. When a death is classified as an unknown cause, it is because portions of the death investigation are incomplete. In 2015, approximately 3,700 infants died of SUID (Center for Disease Control, 2017). Upon investigation, 1,600 of these deaths, or 43%, were determined to be SIDS (Center for Disease Control, 2017). Another 1,200 infants died of unknown causes, and 900 died of accidental strangulation or suffocation (Center for Disease Control, 2017). Of those deaths, the highest number of SUID and SIDS death were in American Indian/Alaska Native and non-Hispanic black infants (Center for Disease Control, 2017). The lowest number of deaths were in Hispanic and Asian/Pacific Islander infants (Center for Disease Control, 2017).

1.2. Triple Risk Model.

While the cause of SIDS remains unknown, there are some theories about why it may occur. One such theory is the “triple risk model” that was proposed by Wedgwood in 1972, and refined by Filiano and Kinney in 1994. This model states that SIDS occurs when three factors are present at once. The first of these factors is that the infant is in a vulnerable period, the second is that the infant has entered a critical developmental period, and the third is that there is an external factor causing stress to the infant (Andrew, 2016).

1.3. American Academy of Pediatrics Current Prevention Recommendations.

The American Academy of Pediatrics' (AAP) current recommendations have a strong focus on the infant's sleeping environment. When putting an infant to sleep, the infant should be placed on his or her back on a firm surface, and the sleeping environment should be free of loose objects. While it is necessary to put the infant to sleep on their back, if the infant can roll over, and they do roll onto their side or stomach while sleeping, they can be left in that position. A firm sleeping surface may include a crib, bassinet, or play yard. It is important to ensure prior to use that the sleeping surface meets the current safety standards. If the infant falls asleep elsewhere other than an appropriate sleeping surface, the infant should be moved to an appropriate sleeping surface as soon as possible. Also, the mattress should have a tight-fitting sheet covering it. An infant's crib should be free of any soft objects or loose pieces of bedding. These objects may include crib bumpers, soft toys, or blankets. The AAP also recommends that an infant should sleep within the same room as the parents or caregivers; however, the infant should not sleep in the same bed. Parents and caregivers should be sure not to overheat the infant. The infant should be kept at a cooler temperature while sleeping, and dressed in a similar number of layers as the parent or caregiver (healthychildren.org, 2017).

The AAP also has other recommendations to reduce the risk of SIDS aside from the sleeping environment. It has been shown that providing an infant with breastmilk for the first six months of life reduces the risk of SIDS. It is also important for the infant to be kept up to date on immunizations and well-visits. Exposure to second hand smoke increases the risk of SIDS. Therefore, the infant should be kept away from those who are smoking or areas where they may be exposed to smoke. Those who are pregnant should also not smoke. Caregivers and parents should refrain from smoking in the car and home as the infant may be exposed to smoke. The use

of a pacifier while the infant is sleeping is also recommended. Lastly, it is important to be aware that cardiorespiratory monitors for the home do not decrease the risk of SIDS (healthychildren.org, 2017).

2. At Risk Populations

2.1. Low Income.

It has been found that mothers with lower incomes who go to Women, Infants, and Children (WIC) centers are less likely to place infants on their back, or the supine position, to sleep. When compared to mothers who did not attend WIC centers, it was found that those who did attend WIC centers were less likely to place their infant in a supine position while sleeping than those who did not attend a WIC center. Only 59% of mothers reported that they placed their infant on their back to sleep, and 43% agreed that there is a relation between the infant's sleeping position and SIDS. It was also discussed that 36% of mothers at WIC centers thought that the prone, or stomach laying, position was the most comfortable (Zundo, Richards, Ahmed, & Codington, 2017). While numerous studies have shown the link between mothers attending WIC centers and noncompliance with placing an infant in a supine position to sleep, overall low-income status also increases the risk of noncompliance with placing an infant to sleep in a supine position (Aitken, Rose, Mullins, Miller, Nick, Rettiganti, Nabawessi, & Whiteside-Mansell, 2016; Zundo et al., 2017). Those with an income of less than \$80,000 a year were found to have less self-confidence in their ability to implement the recommended sleep guidelines. They were also found to have more concern about choking and the infant's head becoming flat when the infant was placed to sleep in the supine position (Varghese, Gasalberti, Ahern, & Chang, 2015).

2.2. African-American.

Infants of African American ethnicity are twice as likely to suffer from SIDS than Caucasian infants (Mathews, Oden, Joyner, He, McCarter, & Moon, 2015; Zundo et al., 2017). African-American parents have also been found to be more likely to use practices that place an infant at a higher risk of SIDS such as placing the infant to sleep in the prone position, using soft objects in the infant's sleep environment, and bedshare (Gaydos, Blake, Gazmararian, Woodruff, Thompson, & Dalmida, 2014; Mathews et al, 2015; Zundo et al, 2017). When asked about putting their infant to sleep on their back, while many knew about the recommendation of supine sleep, most did not follow this recommendation. The reasons stated were that it was due to lack of understanding of the reasoning behind the recommendation, culture, or family influences (Zundo et al, 2017). They are also more likely to believe that there is no relationship between safe sleep guidelines and a reduction in SIDS risk (Varghese et al., 2015). While approximately 90% of African-American mothers intend to put their infant to sleep in the supine position, around one-third of those infants will be sleeping in the prone position within two to four months after birth (Mathews et al., 2015; Zundo et al., 2017).

2.3. Lower Education Level.

Parents who have not acquired a high school degree have been found to be less likely to place an infant to sleep on their back. Those mothers were found to be twice as likely to place the infant in a position other than supine when sleeping compared to those who have an education level past high school (Smylie, Fell, Chalmers, Sauve, Royle, Allan, & O'Campo, 2014; Zundo et al., 2017). Parents and caregivers who did not have a higher education level were found to have a higher level of concern about choking when the infant was placed in the supine position to sleep (Varghese et al., 2015).

3. Factors that Increase the Risk of SIDS

3.1. Prone and Side-Laying Sleeping.

Infants who are placed to sleep in the prone or side-lying sleep positions are at a higher risk of suffering from SIDS (Bartlow et al., 2016; Mathews et al, 2015; Ward & Balfour, 2015). Prior to 1992, it was recommended that infants be placed in the prone position to sleep (Zundo et al, 2017). Roughly 22% of parents and caregivers do not think an infant should be placed in the supine position when sleeping (Varghese et al., 2015). Also, an infant may end up in the prone position due to the desire to have the infant in the parents' bed to promote breastfeeding. When parents become more fatigued, they are at a higher risk to place the infant prone (Zundo et al, 2017). Additionally, the placement of an infant in the prone position for sleeping has been shown to increase the level of thermal stress the infant experiences (Rohde, Corydon, Hansen, Pedersen, Schmidt, Gregersen, & Banner, 2014). This overheating has been shown to be associated with SIDS (Auger, Fraser, Smargiassi, & Kosatsky, 2015).

3.2. Bed Sharing.

The use of bedsharing places an infant at a higher risk of SIDS (Mathews et al, 2015; Ward & Balfour, 2015). To keep the infant close for ease of breastfeeding, the infant may sleep in the same bed as the parents (Zundo et al, 2017). When an infant sleeps in the same bed as parents, there is an increased risk of suffocation, strangulation, and entrapment (Rollins, 2017). Other risks involved with bed sharing include falling off the bed and an increase in thermal stress (Andrew, 2016; Auger, Fraser, Smargiassi, & Kosatsky, 2015).

3.3. Smoking.

It is estimated that roughly 23% of SIDS deaths can be linked to smoking (Mohlman & Levy, 2015). It has been found that if an infant has been exposed to second hand smoke, they are

at a higher risk of suffering from SIDS (Tynan, Holmes, Promoff, Hallett, Hopkins, & Frick, 2016). The relationship between tobacco exposure and SIDS is believed to be caused by the impairment of adrenomedullary chromaffin cells' ability to respond to the stress hypoxia from nicotine places on the infant's body (Banderali, Martelli, Landi, Moretti, Betti, Radaelli, Lassandro, & Verduci, 2015). It has also been estimated that tobacco exposure may contribute to the death of 400 infants each year (Tynan et al., 2016). Approximately 8.6% of pregnant women smoke, prenatal smoking, which is known to increase the risk of SIDS (Kivistö, Tupola, & Kivitie-Kallio, 2015; Mohlman & Levy, 2015). Mothers who did not graduate from high school are the most likely to smoke while pregnant (Mohlman & Levy, 2015). Not only does second hand smoke exposure and smoking while pregnant increase the risk of SIDS, but a smoking mother breastfeeding also increases the risk of SIDS. Even if the mother does not smoke around the infant, the nicotine from tobacco passes into the breast milk (Banderali et al., 2015).

3.4. Soft Bedding Use in Sleep Areas.

Placing an infant to sleep in an area with soft bedding increases the risk of the infant dying from SIDS (Bartlow et al., 2016; Mathews et al, 2015; Ward & Balfour, 2015). While it has been found that the use of soft objects, such as pillows and thicker blankets, may be hazardous, roughly half of parents still use these objects when the infant is sleeping (Andrew, 2016).

4. Factors that Decrease the Risk of SIDS

4.1. Use of Pacifiers.

Research has shown that infants who use a pacifier while sleeping have a significant decreased risk of SIDS (Lubbe & Ham-Baloyi, 2017; Meadows-Oliver & Hendrie, 2013; Varghese et al., 2015). A recent study found that the risk of SIDS was reduced by 70% when an

infant uses a pacifier. This risk reduction occurred in both breastfed and formula fed infants (Moon, Tanabe, Yang, Young, & Hauck, 2011). Even if the pacifier falls out while the infant is sleeping, it was found that the risk reduction will continue to persist throughout sleep (Meadows-Oliver & Hendrie, 2013). It is recommended that the use of a pacifier begin around three to four weeks after the infant is born so that it does not interfere with the establishment of breastfeeding (Varghese et al., 2015). To safely use pacifiers, it should not hang around the infant's neck. Pacifiers that are secured to the infant's clothing or a stuffed animal should not be used when the infant is sleeping (Meadows-Oliver & Hendrie, 2013).

4.2. Supine Sleeping.

The Safe to Sleep, or Back to Sleep, campaign has reduced the rate of SIDS from 130.5 to 39.9 deaths per 1,000 births between 1990 and 2013 (Bartlow et al., 2016). However, only around half of parents will place their infant in the supine position when sleeping. It has also been found that if an infant is put in the supine position for sleep, the parents are more likely to place subsequent infants in the same position to sleep. However, the older the infant is, the less likely parents are to place the infant in a supine position during sleep. The earlier a mother receives prenatal care, the higher the compliance with placing an infant in the supine position to sleep (Zundo et al, 2017).

4.3. Room Sharing.

Research has shown that when an infant sleeps on a separate surface than its parents, but in the same room, the risk of the infant dying from SIDS may be decreased by up to 50%. It has also been suggested that there is high responsiveness rate in mothers when their infant wakes up. Thus, if the infant is in the same room, they may be able to quickly recognize and intervene if an adverse event occurs (Rollins, 2017).

4.4. Breastfeeding.

Research has shown that breastfeeding reduces the risk of SIDS (Ma, Brewer-Asling, & Magnus, 2013). However, it is still unclear why breastfeeding reduces the risk (Thompson, Tanabe, Moon, Mitchell, McGarvey, Tappin, Blair, & Hauck, 2017). While researchers agree that breastfeeding reduces the risk of SIDS, they do not all agree on the length of time needed for protection. One such study states that risk reduction occurs if the infant has been breastfed for any amount of time, and the risk reduction is even higher when the infant is breastfed for more than two months (Fetherston & Leach, 2012). Another study has shown that an infant must be breastfed for two months for the protective effect of breastfeeding to be seen. Breastfeeding longer than four months does show some further protection for the infant. Also, there was no statistically significant difference in these results with regard to exclusive breastfeeding or partial breastfeeding (Thompson et al., 2017).

5. Current Gaps in Knowledge of Parents and Caregivers

5.1. Fear of Infant Choking.

Choking while sleeping is a common safety concern with parents. Many state that the risk of choking is the reason behind placing the infant on their side to sleep. This is especially true with African-American parents (Zundo et al, 2017). Current research has shown that there is no increased risk of aspiration when an infant is placed in a supine position to sleep (Bartlow et al., 2016). There is evidence that shows that the ability to clear secretions may be better when the infant is sleeping in the supine position. This due to the positioning of the trachea on top of the esophagus, thus anything that is regurgitated must work against gravity to become aspirated (Zundo et al, 2017).

5.2. Infant Comfort.

When reasoning behind placing an infant in a non-supine position to sleep was assessed, it was often stated that it was due to the infant's level of comfort (Zundo et al, 2017). When grandmothers were assessed as to why they may place an infant to sleep in the prone position, a reasoning was due to their belief that it was more comfortable for the infant (Aitken et al, 2016).

5.3. Student Conducted Sudden Infant Death Syndrome Research Study

5.3.1. Methods.

5.3.1.1. Study design and population. The study conducted was a self-reported survey on the practices parents and caregivers do that both increase as well as decrease the risk of SIDS. Those who were eligible for the survey had to be over the age of 18, as well as either currently be a parent or caregiver of an infant under one year of age, or have been the parent or caregiver of an infant under one year of age within the past three years.

5.3.1.2. Procedures. Prior to the start of data collection, the study was approved by the Northern Illinois University Honors Program and Institutional Review Board. The survey was developed and distributed using the Northern Illinois University's Qualtrics program. The survey was distributed by multiple people on the social media site Facebook. Data was collected between October 31st, 2017 and November 14th, 2017. No identifying information was collected, as well as respondents were not compensated for their participation in the survey. A total of 89 responses were collected.

5.3.1.3. Measures. The survey consisted of 14 questions regarding practices that increase and decrease the risk of SIDS. The questions were "Baby put to sleep on his/her back", "Baby put to sleep on his/her stomach", "Baby put to sleep on his/her side", "Baby put to sleep on a firm surface", "Baby put to sleep on a soft surface", "Baby sleeps/slept with no loose

objects in the crib”, “Baby sleeps/slept in the same room as the parent(s)/caregiver(s)”, “Baby sleeps/slept in the same bed as the parent(s)/caregiver(s)”, “Baby receives/received breast milk during the first year of life”, “Keep/kept baby up to date on vaccines”, “Baby is/was exposed to second hand smoke”, “Baby is/was kept cool while sleeping”, “Baby uses/used a pacifier when sleeping”, and “Mother smoked during pregnancy”. The answer choices for each question included yes, no, and unsure.

5.3.1.4. Data analysis. Data was analyzed using Northern Illinois University’s Qualtrics program. The program provided the number as well as percentage of answers in each category per question. Of the 89 participants who participated in the survey, two did not meet the eligibility requirements, leaving 87 responses that were used in data analysis.

5.3.2. Results. When analyzing the data, the majority of parents and caregivers were found to be following the AAP’s safe sleep recommendations (Table 1; healthychildren.org, 2017). As previously referenced, infants should be placed to sleep on their back on a firm surface

Table 1 – Sleep behaviors

	Yes	No	Unsure
Baby put to sleep on his/her back	81 (93.10%)	6 (6.90%)	0 (0.00%)
Baby put to sleep on his/her stomach	17 (19.54%)	70 (80.46%)	0 (0.00%)
Baby put to sleep on his/her side	23 (26.74%)	61 (70.93%)	2 (2.33%)
Baby put to sleep on a firm surface	84 (97.67%)	0 (0.00%)	2 (2.33%)
Baby put to sleep on a soft surface	14 (16.28%)	70 (81.40%)	2 (2.33%)
Baby sleeps/slept with no loose objects in the crib	62 (71.26%)	25 (28.74%)	0 (0.00%)
Baby sleeps/slept in the same room as the parent(s)/caregiver(s)	61 (70.11%)	24 (27.59%)	2 (2.30%)
Baby sleeps/slept in the same bed as the parent(s)/caregiver(s)	19 (21.84%)	67 (77.01%)	1 (1.15%)
Baby receives/received breast milk during the first year of life	79 (90.80%)	8 (9.20%)	0 (0.00%)
Keep/kept baby up to date on vaccines	80 (91.95%)	5 (5.75%)	2 (2.30%)
Baby is/was exposed to second hand smoke	1 (1.15%)	80 (91.95%)	6 (6.90%)
Baby is/was kept cool while sleeping	65 (74.71%)	14 (16.09%)	8 (9.20%)
Baby uses/used a pacifier when sleeping	50 (57.47%)	36 (41.38%)	1 (1.15%)
Mother smoked during pregnancy	0 (0.00%)	80 (91.95%)	7 (8.05%)

with no loose objects in the same room as parents. The infant should also be kept up to date on// vaccines, breastfed, kept cool while sleeping, use a pacifier while sleeping, and be kept away from smoke prenatally and as an infant (healthychildren.org, 2017). The lowest compliance rate with factors that decrease the risk of SIDS was seen with the use of a pacifier while sleeping, with only 57.47% of respondents stating that they do use a pacifier while the infant is sleeping, followed by infant sleeping in the same room as parents or caregivers (70.11%) and no loose objects in the crib (71.26%). The highest compliance rate was seen with placement of an infant on a firm surface while sleeping (97.67%) followed by placing the infant to sleep on their back (93.10%). In regard to factors that increase the risk of SIDS, the highest rates were seen with placement of the infant on their side (26.74%) and the infant sleeping in the same bed as the parents or caregivers (21.84%).

The rate of parents and caregivers placing an infant to sleep on their back (93.10%) was higher in this study than previous studies, as some have shown that 22% of parents do not think that an infant should be placed in the supine position (Varghese et al., 2015). No parents or caregivers in this study indicated that the mother smoked while pregnant, in comparison to the 8.6% of mothers who were found to smoke while pregnant in a separate study (Kivistö et al., 2015). While a number of parents in this study do or did have soft objects in the infant's crib (28.74%), this is lower than the roughly half of parents found to use soft objects in cribs in a study by Andrew (2016).

5.3.3. Discussion. While this study does show higher rates of compliance with the AAP's recommendations for SIDS reduction than previous studies (Andrew, 2016; Kivistö et al., 2015; Varghese et al., 2015), it also shows that there are still many areas where increased education is needed. An area in particular need of increased education is the use of a pacifier while sleeping

as it may reduce SIDS rates by up to 70% (Moon et al., 2011). In this study, only 57.47% of parents and caregivers reported that the infant uses or used a pacifier while sleeping. Parents should be educated on when a pacifier should start being used, which is once the infant is three or four weeks old to avoid interference with breastfeeding initiation, along with safety factors (Varghese et al., 2015). When providing education to parents and caregivers, it is important for nurses to educate not just on the interventions, but the reasoning behind the interventions.

5.3.4. Limitations. The author recognizes that this study does have limitations. As the study did not collect demographic information, it is not possible to determine if the study included a diverse population, or if there were any correlations between demographics and study responses. The study also did not have a large population. This study only collected quantitative information. The collection of qualitative data regarding parent and caregiver perception about safe sleep practices may have given further insight into why parents and caregivers were doing certain practices. Lastly, the study was only distributed in one way, on the social media site Facebook. Further studies should collect demographic information, include more participants, collect qualitative information, and be distributed in more than one way.

6. Barriers to Education

6.1. Family Members Encouraging Non-Compliance.

A major barrier to non-compliance with education is family members. In particular, grandmothers may encourage non-compliance as they have a strong influence over a mother's practices involving her infant. Research has shown that grandmothers report a low level of compliance with the AAP's safe sleep recommendations, particularly in their own home. Only 44% of grandmothers were found to be placing the infant to sleep on their back and on an acceptable sleep surface, such as a crib or play yard, when in their own home and 57% of the

time when in the mother's home. Grandmothers who believe that a supine sleep position was associated with choking were less likely to be found following safe sleep recommendations (Aitken et al, 2016). Older relatives were also found to be main contributors to advising parents to place their infant in a prone sleep position (Zundo et al, 2017). In particular, when the grandparent lives in the same home, the parents are more likely to place the infant in the prone position to sleep (Gaydos et al., 2014).

6.2. Nursing Staff.

An unexpected barrier to SIDS risk reduction is nurses. Through research it has been found that nurses do not always comply with the AAP's recommendations for SIDS prevention (Bartlow et al., 2016; Varghese et al., 2015). It is important for nurses in postpartum units to be modeling the recommendations for SIDS reduction, as through the modeling of correct behavior they are also providing education (Bartlow et al., 2016). While the AAP recommends infants be placed supine while sleeping, not all nurses follow this recommendation. Parents have observed nurses place infants in the prone position for sleeping in neonatal nurseries (Zundo et al, 2017). Also, when observed, 34% of nurses were found to not be meeting the AAP's safe sleep recommendations. When questioned regarding their practices and beliefs in SIDS prevention, while 95% of nurses knew that the infant should be placed in the supine position, only 53% of those nurses said that they always placed infants in the supine position. While research has shown that sleep position is associated with SIDS, only 74% of the nurses questioned believe that research to is true; and 25% believe that placing an infant in the supine position increases their risk of aspiration. Nurses stated that policy was the most influential factor with regard to what position they place an infant to sleep in (Bartlow et al., 2016).

Along with lack of nurse compliance, not all parents are receiving the necessary education on SIDS prevention. A study found that only 71% of parents received education regarding the proper sleep position for infants prior to discharge from the hospital following delivery (Zundo et al, 2017). However, 89% of nurses in a separate study stated that they encouraged parents to place their infant in the supine position when sleeping, and 79% stated that they included the AAP's recommendations on safe sleep in discharge teaching (Bartlow et al., 2016).

7. Improvement in Education

It is important for parents to be educated regarding practices that increase and decrease the risk of SIDS. Especially those who are at higher risk should receive education on SIDS reduction (Zundo et al, 2017). Parents and caregivers that reported having received education on safe sleep practices were found to have a stronger belief that safe sleep behaviors impact the risk of SIDS, as well as they have a higher awareness of the infant's susceptibility to SIDS (Varghese et al., 2015). It is important to target the modifiable risk factors in education. There are various ways to provide education to parents and caregivers. One such way is through a simple questionnaire on SIDS, which may increase awareness of risks and compliance with safe sleep practices. An individual education session on SIDS prevention, which included written information, improved supine sleep position compliance in a study in Brazil. Providing education to nurses first, followed by parents, with the use of videos, posters, and nursing education has also been found to improve safe sleep compliance. The use of campaigns to encourage placement of infants in the supine position while sleeping was found to be beneficial. The campaign included written information, public events such as lectures, television programs, and an antismoking campaign (Zundo et al, 2017).

8. Nursing Implications

Awareness and education about practices that increase and decrease the risk of SIDS is vital in the reduction of infant deaths from SIDS. When providing education, while all parents need education on SIDS prevention, it is important to especially target higher risk populations such as African-American parents and parents with a lower income and education level. With the postpartum stays in hospitals for vaginal deliveries being only 24-hours, education must occur at times other than the postpartum stay in the hospital. Nurses can also provide parents with education at prenatal visits and classes, and at the pediatrician's office (Zundo et al, 2017). The study conducted by the author found multiple areas where increased education to parents is needed. These areas include sleep position, the use of a pacifier while sleeping, placing the infant to sleep in the same room as the parents, and the need for no loose objects in the crib while the infant is sleeping. While the study was small and did not collect demographic information, it does show what areas parents and caregivers need improved education in.

One area of high nursing concern is compliance of nurses with the AAP's safe sleep guidelines. Nurses who work in labor and delivery and postpartum units can demonstrate safe sleep recommendations each time they provide care for the infant. It is important they these nurses are demonstrating the correct sleep positioning for infants not only for safety reasons, but because they are also providing teaching through this demonstration. This teaching occurs whether the nurse is actively instructing parents, or if the parents are observing the nurse's behavior. As previously mentioned, it has been reported that 34% of nurses are not always following the guidelines. This means that the parents of the infants they are caring for are not seeing the correct safe sleep techniques when these nurses are caring for their infants. Thus, it is important that the compliance of nurses with the AAP's safe sleep guidelines increases. In order

to increase compliance of nurses with safe sleep recommendations, the creation of written policies on sleep position should be developed, as in one study nurses indicated that policy was the number one influential factor in the position they placed infants in (Bartlow et al., 2016).

9. Conclusion

To conclude, the death of infants from SIDS is an urgent issue that must be addressed. In 2015 3,700 infants died unexpectedly, with 1,600 of those deaths from SIDS (Center for Disease Control, 2017). It is important for nurses to be aware of at risk populations in order to ensure that those populations receive additional education. Populations at a higher risk of having an infant die from SIDS are those with a lower income, are African-American, and those with a lower education level (Mathews, Oden, Joyner, He, McCarter, & Moon, 2015; Smylie et al., 2017; Zundo et al., 2017). When providing education to parents and caregivers of infants, it is important to include both practices that increase the risk of SIDS as well as decrease the risk of SIDS. Practices known to increase the risk of SIDS include placement of the infant in the prone or side-lying position during sleep, bed sharing, exposure to smoke or prenatal smoking, and the use of soft bedding in the sleep area (Bartlow et al, 2016; Mathews et al., 2015; Tynan et al., 2016; Ward & Balfour, 2015). Practices that decrease the risk of SIDS include the infant's use of a pacifier while sleeping, placement of the infant supine while sleeping, the infant sleeping in the same room as parents or caregivers, and breastfeeding (Bartlow et al., 2016; Lubbe & Ham-Baloyi, 2017; Ma et al., 2013; Meadows-Oliver & Hendrie, 2013; Rollins, 2017; & Varghese et al., 2015). Noncompliance with recommendations, in particular sleep position, can be an issue. The fear of choking and the infant's level of comfort has been found to be a factor in parental and caregiver noncompliance with the placement of an infant to sleep supine (Zundo et al., 2017).

The study conducted by the author showed a higher level of compliance with the AAP's recommendations for SIDS risk reduction in comparison to previous studies (Andrew, 2016; Kivistö et al., 2015; Varghese et al., 2015). It identified areas where increased education is needed. Particular areas in need of education include pacifier use, infant sleep position, the use of soft objects in sleep areas, and having the infant sleep in the same room, but not the same bed, as parents and caregivers. Major barriers to patient education are family members, particularly grandmothers, and nursing staff (Aitken et al., 2016; Bartlow et al., 2016; Varghese et al., 2015). While research has shown that supine sleep position lessens the risk of SIDS, not all nurses believe this to be true (Bartlow et al., 2016). It is important that nurses be compliant with SIDS prevention guidelines in order to further provide education to parents and caregivers. Education of parents and caregivers is vital in SIDS reduction.

As SIDS continues to be an issue, further research is needed. Through investigation of recent research, the author has concluded areas in which additional research should be focused. Many articles were found that examined at risk populations and factors that increased as well as decrease the risk of SIDS. Limited additional research is needed in these areas. Additional research in these areas should focus on the cause behind why a practice increases or decreases the risk of SIDS. Areas where additional research is needed include education strategies for SIDS reduction and continued research on the cause of SIDS.

10. References

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